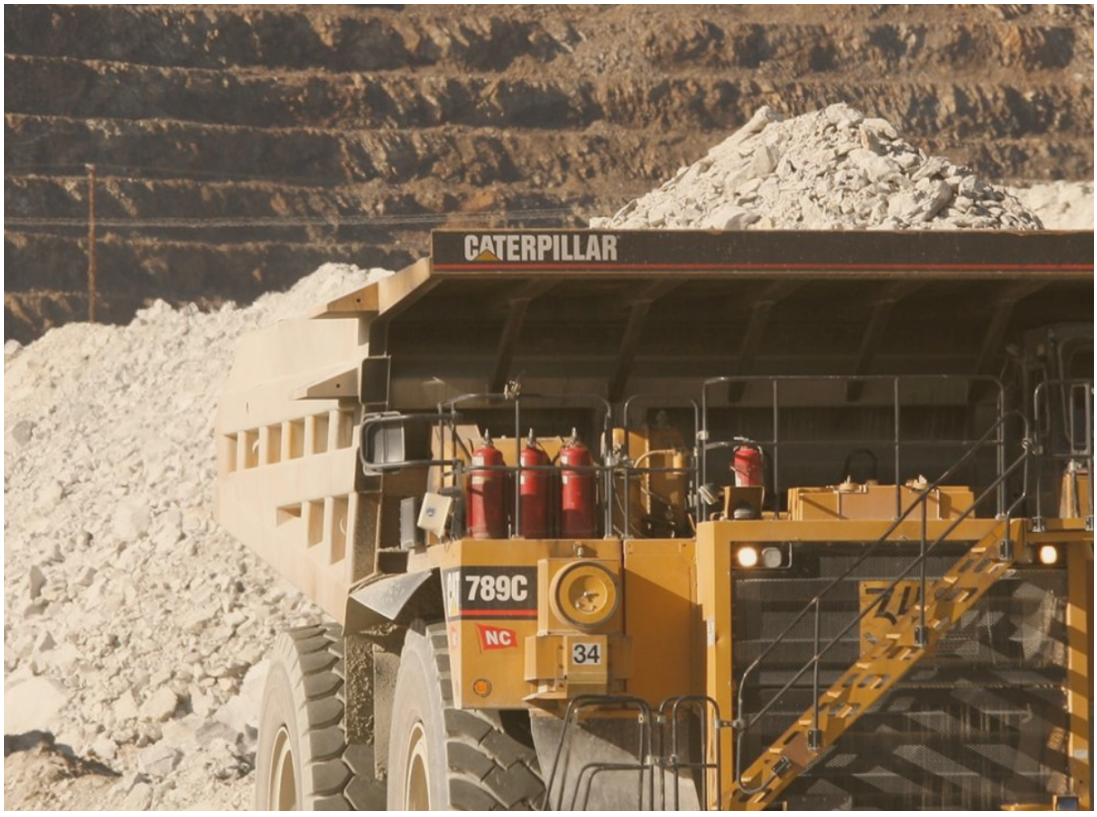
Fairbanks Gold Mining, Inc.

Fort Knox Mine
2024 Environmental Audit Report

December 19, 2024



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2024 Environmental Audit Report

December 19, 2024

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Acronyms and Abbreviations

AAC	Alaska Administrative Code
ACOE	United States Army Corps of Engineers
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources, Division of Mining, Land and Water
APDES	Alaska Pollutant Discharge Elimination System
AS	Alaska Statutes
BMP	best management practices
CESCL	Certified Erosion and Sediment Control Lead
CFR	Code of Federal Regulations
COBC	Compliance Order by Consent
DMR	Discharge Monitoring Report
EDMS	Electronic Document Management System
FGMI	Fairbanks Gold Mining Inc.
ft^3	cubic foot
HAPS	Hazardous Air Pollutant Standards
MACT	Maximum Achievable Control Technology
MSGP	Multi-sector General Permit
NESHAP	National Emission Standards for Hazardous Air Pollutants
NOV	Notice of Violation
NSPS	New Source Performance Standard
POA	Plan of Operations Approval
POO	Plan of Operations
QAPP	Quality Assurance Project Plan
RCP	Reclamation and Closure Plan
RICE	Reciprocating Internal Combustion Engine
RO	reverse osmosis
SPCC	Spill Prevention, Controls and Countermeasures
SRCE	Standardized Reclamation and Closure Estimator
SWPPP	Stormwater Pollution Prevention Plan
TLO	Alaska Mental Health Trust Land Office
TSF	Tailings Storage Facility

TWUA	temporary water use authorization
USDOT	U.S. Department of Transportation
USEPA	United States Environmental Protection Agency
WAD	weak-acid dissociable
WMP	Waste Management Plan

Executive Summary

This report provides the results of the Fairbanks Gold Mining Inc. (FGMI) Fort Knox Mine (Fort Knox) environmental audit conducted in August 2024. As stipulated by the FGMI's Plan of Operations Approval (POA), this environmental audit is to be conducted by a third-party contractor before expiration of FGMI's POA and Waste Management Permit (WMP); these authorizations are set to expire on March 25, 2025, and FGMI will submit renewal applications 120 days before this expiration date.

In June 2024, FGMI contracted Arcadis U.S., Inc. (Arcadis) to conduct this third-party environmental audit, which included review of the Fort Knox Mine POA, Amended and Restated Millsite Lease, and WMP, as well as all permits and authorizations included by reference within these three documents. This environmental audit also included direct engagement with Alaska Department of Environmental Conservation (ADEC), Alaska Department of Natural Resources (ADNR), and Alaska Department of Fish and Game (ADF&G) staff in the Fairbanks offices on August 12, 2024 and a Fort Knox Mine on-site inspection, which took place on August 13 through 15, 2024.

Based on the audit team's review of documents and approvals, as well as observations made during the on-site inspection, FGMI appears to be successfully adhering to the environmental requirements set out in the Fort Knox Mine authorizations and permits. Specific minor exceptions, observations, and findings are discussed within this report. In addition, the operations and closure plans developed by FGMI and approved by ADEC and ADNR were observed to be accurate and complete, and the financial assurance is adequate as of its approval in 2020. Specific observations based on the items included in the environmental audit are summarized below.

- **Plan of Operations & Waste Management Permit**: Minor low-risk findings are administrative in nature (e.g., one-time errors in paperwork, labeling, data entry, etc.). Specific deficiencies are noted in Section 2.5.
- **Stormwater Discharge**: The stormwater program appears to be well run, with no significant problems identified. However, recommendations are provided to ensure that the certification statement is sent each year before the January 31 deadline.
- **Point Source Water Discharge**: The discharge records are accurate and complete, personnel have the required training, and no issues were discovered. A minor recommendation to apply for increased allowable holding time for the whole effluent toxicity (WET) test is provided in Section 4.
- **Water Use**: Fort Knox complies with the annual reporting requirements for water use.
- **Reclamation and Closure Plan and Financial Assurance**: The Reclamation and Closure Plan (RCP) and amendments are accurate and complete, and the financial assurance appears adequate based on plans and information through 2021, although updates to these plans and assurances will be needed.
- **Millsite Lease**: The Millsite Leases, amendments, and changes appear to be accurate and complete and are supported by the compliance of the other audited programs in this report.
- **Dam Safety**: The Tailings Dam fully complies with its requirements and FGMI follows all procedures and adequately documents information required by the ADNR permit and Operations and Maintenance Manual.
- **Fish Permits**: A records and field review of fish passage permits indicated compliance and identified no issues.
- **Air Quality**: Fort Knox has a robust air quality program and is generally in compliance with permit and regulatory requirements. Minor observed deficiencies and recommendations for improvement are noted in Section 10.5.

1 Introduction

Fairbanks Gold Mining Inc. (FGMI) operates the Fort Knox Mine (Fort Knox) outside of Fairbanks, Alaska, under the authorization of the Alaska Department of Natural Resources (ADNR) and the Alaska Department of Environmental Conservation (ADEC). Authorization to operate Fort Knox is granted under several documents and permits. The three primary approval documents for Fort Knox operations include the following (other required specific authorizations are included by reference within these documents):

- FGMI Plan of Operations Approval (POA): Effective March 25, 2020; expires March 24, 2025;
- Amended and Restated Millsite Lease (Millsite Lease): Originally issued February 15, 1994; amended and restated July 8, 2022; continues until reclamation is completed;
- Waste Management Permit (WMP): Effective March 25, 2020; expires March 24, 2025.

FGMI is currently preparing to submit renewal applications for the POA and WMP in late 2024, 120 days before the March 24, 2025 expiration date. As stipulated in the POA, an environmental audit is required before renewal of these approvals. Specifically:[1]

> ***Environmental Audit.*** *Unless waived by the department, a periodic third-party environmental audit shall be completed during the final year of the permit term or sooner if final closure starts during the permit term. However, the field inspection portion of the audit shall be conducted during the snow free season the year before permit expiration. The audit will include all aspects of this Plan of Operations Approval. The environmental audit is required to verify the Permittee's compliance with applicable environmental laws associated with this permit. The third-party contractor should be mutually agreed on by the State and the Permittee, but in the event that agreement cannot be reached, the State retains the final contractor selection decision. Costs for the third-party contractor shall be borne by the Permittee. The intent of the audit is to evaluate whether both Permittee management and agency permit administration provide reasonable assurances that the facility and environmental controls are functioning as intended. The environmental audit shall include an evaluation of the adequacy of the approved financial assurance.*

In June 2024, FGMI contracted Arcadis U.S., Inc. (Arcadis) to conduct this environmental audit, and Arcadis subcontracted Jade North, LLC (Jade North) for additional support. Consistent with the stipulations of the POA, the objectives of the audit included:

- Review and assess FGMI's compliance with (at minimum) the POA, Millsite Lease, WMP, and documents included by reference. Per agreement with FGMI, this audit is to be an objective, systematic, and documented review of the conditions, operations, and practices related to permit requirements and facility management conducted under the POA and the WMP.
- Complete the audit based on FGMI activities and documents specific to the period from March 28, 2019 to the present (covering the full period from the previous permit renewals and corresponding Fort Knox environmental audit completed by SRK[2]).

[1] Alaska Department of Natural Resources (ADNR). 2020. Fort Knox Mine Plan of Operations Approval, No. F20209852POOA. Division of Mining, Land and Water. March 25.
[2] SRK Consulting (U.S.), Inc. 2019. Environmental Compliance and Management Systems Audit, Fort Knox Gold Mine. February.

- Conduct an on-site inspection and evaluation of FGMI's controls to maintain compliance with authorizations and permits, and confirm that these authorizations, permits, and controls uphold environmental protection.
- Complete the on-site field inspection component of the audit during the snow-free season in 2024 (the year before permit expiration).
- Directly engage with ADEC, ADNR, Alaska Department of Fish and Game (ADF&G), and the Alaska Mental Health Trust Land Office (TLO). Review public records maintained by these agencies that may be relevant to the environmental audit.
- Evaluate the approved financial assurance to assess its adequacy for addressing project liabilities as outlined in the Reclamation and Closure Plan (RCP).

The environmental audit document review and site inspection were conducted by the following Arcadis and Jade North personnel (collectively, the "audit team"):

- Tom Nannini, Arcadis: Mine site audit specialist, lead auditor;
- Liz Carson, Arcadis: Air permitting and environmental audit specialist;
- Bob Loeffler, Jade North: Alaska regulatory specialist; and
- Michael Hay, Arcadis: Mining geochemistry/hydrogeology specialist.

The Fort Knox site inspection and document review was completed between July 1 and August 15, 2024 and included the following events:

- July 1 through July 31, 2024: Inspection of documents and authorizations provided by FGMI, ADEC, ADNR, and ADF&G (including those available on ADEC and ADNR websites);[3]
- July 31, 2024: Kickoff meeting attended by Arcadis/Jade North, FGMI, ADNR, and ADEC;
- August 12, 2024: Visit to ADEC, ADNR, and ADF&G offices by Arcadis/Jade North personnel (Tom Nannini and Bob Loeffler) to review documents and meet with ADEC, ADNR, and ADF&G; and
- August 13 through 15, 2024: Fort Knox on-site inspection conducted by Arcadis and Jade North personnel.

This report identifies the specific documents reviewed and describes observations and findings (if applicable) by the audit team following the document review and on-site inspection. Additional detail on background and current operations at the Fort Knox Mine are provided in FGMI's Plan of Operations (POO)[4] and the RCP[5] and associated amendments.

2 Plan of Operations & Waste Management Permit

FGMI prepared and submitted a POO and a WMP renewal application in January 2020, two POO modifications, and four amendments. The Waste Management Permit (# 2020DB0002) was issued on March 25, 2020 and expires on March 24, 2025.

[3] Alaska Department of Natural Resources (ADNR). Undated. Fort Knox Mine. <web page> Located at: https://dnr.alaska.gov/mlw/mining/large-mines/fort-knox/; Accessed: October 10, 2024.
[4] Fairbanks Gold Mining, Inc. (FGMI). 2020. Fort Knox Mine Plan of Operations & Waste Management Permit Renewals. Facility Description. Revision 1. January.
[5] Fairbanks Gold Mining, Inc. (FGMI). 2020. Fort Knox Mine Reclamation and Closure Plan. January.

2.1 Jurisdiction

The POO and WMP are regulated as follows:

- Plan of Operations – ADNR, Division of Mining, Land and Water, under Alaska Statutes (AS) 38.05 (Alaska Land Act) and the 11 Alaska Administrative Code (AAC) 86.800 (Plan of Operations); and
- Waste Management Permit – ADEC under AS 46.03 and ACC 18 AAC 15, 18 AAC 60, 18 AAC 70, and 18 AAC 72.

2.2 Document and Record Review

The audit team reviewed the current POO and WMP, modifications, and amendments. The findings of these reviews were the basis for determining field evidence of accuracy and completeness of the RCP and amendments. In addition to the document review, a representative sampling of operational records in support of the POO and WMP, modifications, and amendments was completed while on site and complemented with interviews of relevant areas of understanding. Documents reviewed included:

- POO and WMP Renewals, January 2020, Revision 1;
- POO modification, August 20, 2020 - constructing a decant tower system in the North Pond of the Tailings Storage Facility (TSF);
- POO Amendment, Victoria Creek Waste Rock Dump, March 31, 2021 (Revision 1 – May 18, 2021);
- POO Amendment, Gil Satellite Mine, March 31, 2021 (Revision 1 – May 17, 2021);
- Request for Modification to the POO – Barnes Creek Fuel Island, February 6, 2021;
- POO Amendment, Manh Choh Satellite Mine Ore Processing, March 31, 2023;
- Request for minor amendment to the POO – Expand organic matter topsoil stockpile #5, April 11, 2023;
- WMP, Fairbanks Gold Mining Inc., March 25, 2020 – Permit # 2020DB0002; and
- WMP Conditional Approval to Process and Dispose of Manh Choh Project Ore, September 11, 2023.

2.3 Interviews

FGMI employees and representatives from the FGMI Environmental Department were interviewed regarding the completeness and accuracy of the information in the POO and WMP. FGMI employees included Brent Culleton, Eddie Packee, Muradur Rashedin, Jessie Dunshie, David Stewart, Shaun Slater, Ryan Stahl, Marissa Wood, Amanda Bardor, Emily Bellant, Steve Kinsey, Gerard Hoholik, and Ding Zhang. Additional interviews were completed before the on-site audit with representatives from the ADNR, Division of Mining, Large Mines Program. ADNR representatives included William Grom, Aaron Cruz, and Carolyn Curley and ADEC, Division of Water's Tim Pilon.

2.4 Field Visit

Multiple field visits were conducted during the on-site audit. These included all facilities in the process flow of the mining including mill and operational support facilities (burn pit, waste storage facility, maintenance shops,

department offices and trailers, petroleum storage and dispensing, conveyors and stockpiles); TSF; decant and seepage water infrastructure; water reservoir; Walter Creek and Barnes Creek Heap Leach systems; open pit mine; waste rock dumps; haul roads; and the Gil Project site including open pit mines, waste rock dumps, truck shop, refueling and maintenance area, and haul roads.

2.5 Conclusion

Based on the results of the audit process, consisting of document and record review, interviews to further the understanding of the specific program parameters, and field visit to identify evidence of compliance or non-compliance, the POO and modifications and amendments appear to be accurate and complete. FGMI appears to be following the WMP, except for minor differences consisting of omission or specificity of deleterious details and observations or deficiency, which are mostly administrative in nature. This includes temporary or occasional instances of non-compliance with regulatory requirements. Examples include low-risk findings of one-time errors in paperwork, labeling, data entry, inspections, or monitoring. Notwithstanding these examples, the operations and management of the site appear to be well engineered and well maintained. The table below details the observed deficiencies.

Table 2-1. POO and WMP Observations and Findings.

Regulation or Key Document Reviewed	Evaluation of Compliance	Description	Situation and/or Regulation Specific to Finding/Observation	Facility
40 CFR 262.23	On-site observations and interviews.	A review of hazardous waste shipments and training records indicated that a hazardous waste manifest was signed by the generator certifying, "I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packages, marked and labeled/placarded, and are in proper condition for transport according to applicable international and national governmental regulations...." This certification implies that the signee has and is trained under USDOT Hazardous Materials (49 CFR 172 and 173). A review of training records indicate that the signee does not currently have a USDOT Hazardous Materials certification.	§ 262.23 Use of the manifest. (a) The generator must: (1) Sign the manifest certification by hand; and…..	Waste storage facility
18 AAC 50.065. Open Burning.	On-site observations and interviews	Inspection of the burn pit indicated numerous non-conforming wastes mixed with compliant waste. The non-conforming wastes included metal drums and plastic buckets. Interviewee indicated that the non-conforming waste would be removed before controlled burns.	18 AAC 50.065. OPEN BURNING. (a) Except when conducting open burning under (g), (h), or (i) of this section, a person conducting open burning shall comply with the limitations of (b) - (f) of this section and shall ensure that…. (2) before igniting the burn, noncombustibles are separated;…	Burn Pit
Waste Management Permit, March 25, 2020 – Permit # 2020DB0002 and 18 AAC 70.010	On-site observations, review of documents and interviews	Current Waste Management Plan does not include the monitoring of Gil waste rock dump water quality. Several seeps/springs have developed at the toe of selected dumps, and there does not appear to be sufficient waste rock characterization to indicate that the seeps/springs are not being impacted geochemically.	18 AAC 70.010. General. (a) A person may not conduct an operation that causes or contributes to a violation of the water quality standards set by this chapter. (b) The water quality standards set by this chapter specify the degree of degradation that may not be exceeded in a waterbody as a result of human actions. The water quality standards are set by the antidegradation policy	Gil Mine

Regulation or Key Document Reviewed	Evaluation of Compliance	Description	Situation and/or Regulation Specific to Finding/Observation	Facility
			in 18 AAC 70.015, the water quality criteria in 18 AAC 70.020(b), and the limits in 18 AAC 70.030, applied in accordance with the remainder of this chapter.	
USEPA 40 CFR 262.16 (b)(6)(C)	On-site observations and interviews	Multiple containers accumulated at the Waste Storage Area do not have accumulation start dates. It should be noted that the labels were corrected during the on-site audit.	(6) ***Labeling and marking of containers and tanks—.*** (i) ***Containers.*** A small quantity generator must mark or label its containers with the following:… (C) The date upon which each period of accumulation begins clearly visible for inspection on each container.	Waste storage Area and Conex
USEPA 40 CFR 262.16 (b)(6)(A and B)	On-site observations and interviews	Two containers accumulated at the Waste Storage Area are mislabeled as hazardous waste when they are universal waste, and one container is mislabeled as universal waste when it is actually hazardous waste. It should be noted that the labels were corrected during the on-site audit.	(6) ***Labeling and marking of containers and tanks—.*** (i) ***Containers.*** A small quantity generator must mark or label its containers with the following: (A) The words “Hazardous Waste”; (B) An indication of the hazards of the contents (examples include, but are not limited to, the applicable hazardous waste characteristic(s) (*i.e.,* ignitable, corrosive, reactive, toxic); hazard communication consistent with the Department of Transportation requirements at 49 CFR part 172 subpart E (labeling) or subpart F (placarding); a hazard statement or pictogram consistent with the Occupational Safety and Health Administration Hazard Communication Standard at 29 CFR 1910.1200; or a chemical	Waste storage Area and Conex

Regulation or Key Document Reviewed	Evaluation of Compliance	Description	Situation and/or Regulation Specific to Finding/Observation	Facility
			hazard label consistent with the National Fire Protection Association code 704); and….	
Waste Management Permit Section 2.2.4.2	On-site observations and interviews	Multiple open containers of used oil were observed in the Gil Maintenance and Refueling Area.	Waste Management Permit Section 2.2.4.2 - The permittee shall maintain fuel handling and storage facilities in a manner that will prevent the discharge of hazardous substances.	Gil Maintenance and Refueling Area
USEPA 40 CFR 112.7(a)(3)(i)	On-site observations and interviews	The Gil oil storage pad is not in the current Spill Prevention Control and Countermeasure (SPCC) Plan. The storage pad contains approximately 10 totes and 20 55-gallon drums of oil products and waste.	40 CFR 112.7(a)(3) and (i) "Describe in your Plan the physical layout of the facility and include a facility diagram, which must mark the location and contents of each fixed oil storage container and the storage area where mobile or portable containers are located. The facility diagram must identify the location of and mark as “exempt” underground tanks that are otherwise exempted from the requirements of this part under § 112.1(d)(4). The facility diagram must also include all transfer stations and connecting pipes, including intra-facility gathering lines that are otherwise exempted from the requirements of this part under § 112.1(d)(11). You must also address in your Plan: (i) The type of oil in each fixed container and its storage capacity. For mobile or portable containers, either provide the type of oil and storage capacity for each container or provide an estimate of the potential number of mobile or portable containers, the types of oil, and anticipated storage capacities;"	Gil Maintenance and Refueling Area
Alaska's 18 Alaska Administrative	On-site observations Mill (near lab)	Interviews indicated that the facility's drinking water system may not include backflow-prevention assemblies when there is evidence	Section 18 AAC 80.025 - Cross-connections prohibited and backflow protection (a) A person may not construct, install, or use	Mill and Administration Building

Regulation or Key Document Reviewed	Evaluation of Compliance	Description	Situation and/or Regulation Specific to Finding/Observation	Facility
Code, Section 18 AAC 80.025, prohibits cross-connections in public water systems.	and Administration Building janitor closet), interviews and review of documents	of potential routes of contamination caused by a backflow through unprotected cross-connections. The addition of backflow-prevention assemblies will trigger additional requirements such as testing and health hazard assessments. It is recommended that the drinking water system be evaluated for the need for backflow-prevention assemblies, which may include air gap or other passive controls.	of a cross-connection in a public water system, or allow a water system that contains a cross-connection to connect to a public water system. (b) If the department determines that a facility has the potential to contaminate a public water system through backflow, the owner of the public water system shall install, maintain, and test on the water service line to and at other locations in that facility, a backflow prevention device that conforms to ANSI/AWWA Standards C510-97, Double Check Valve Backflow Prevention Assembly, or C511-97, Reduced-Pressure Principle Backflow Prevention Assembly, adopted by reference in 18 AAC 80.010(b). The owner of the public water system may delegate the installation, maintenance, and testing of the backflow prevention device to the operator of the facility that poses the risk. This delegation does not relieve the owner of the public water system of the responsibility to install, maintain, and test the backflow prevention device.	

Notes:

CFR = Code of Federal Regulations

SPCC = Spill Prevention, Control, and Countermeasure

USDOT = U.S. Department of Transportation

USEPA = United States Environmental Protection Agency

3 Stormwater Discharge

This section provides the results of the Fort Knox Environmental Audit with respect to stormwater discharge authorized by the ADEC.

3.1 Jurisdiction

ADEC regulates stormwater discharge in Alaska consistent with requirements of the Clean Water Act under delegated authority from the USEPA. Fort Knox discharges stormwater under four authorizations from ADEC:[6]

- Best Management Plan (BMP) Plan: APDES Permit AK0053643. Section 2.2 of Alaska Permit Discharge Elimination System (APDES) Permit AK0053643 requires a BMP Plan. The BMP Plan must be consistent with USEPA guidance documents for the regulation of stormwater. The BMP Plan includes areas within the coverage of APDES Permit AK005643. The Permit became effective June 1, 2018; modification #1 (increased flow from non-stormwater discharge) became effective June 1, 2020. The Permit expired on May 31, 2023, but has been administratively extended since that time. The BMP Plan covers the area of the APDES Permit, which is the area upstream including the tailings dam.

- Fort Knox Multi-Sector General Permit (MSGP): APDES AKR06AB17. ADEC issued the MGSP for Storm Water Discharges Associated with Industrial Activity (MSGP Permit Number AKR06000), effective April 1, 2020. FGMI's stormwater discharge is authorized under that MSGP. FGMI's coverage is through Permit AKR06AB17, and the area of the Permit extends downstream from the tailings dam to and including the Freshwater Reservoir Dam.

- Gil MSGP: APDES AKR06AB39. The Gil Project received stormwater discharge approval under the ADEC MSGP with the authorization of AKR06AB39. Coverage under this Permit extends from the edge of the Fort Knox MSGP coverage through the Gil Project.

- Gilmore MSGP: APDES AKR06AB19. The Gilmore extension to the Fort Knox Mine received stormwater discharge approval under the ADEC MSGP with the authorization number AKR06AB39. Coverage under this Permit extends outside the south and east border of the APDES Permit AK0053643 and includes the Gilmore disturbance.

3.2 Document and Record Review

The audit team reviewed a sample of the stormwater records including the BMP Plan for the Permit AK0053643 and the Stormwater Pollution Prevention Plans (SWPPPs) for the other three permits. For the BMP Plan, two randomly selected weekly inspections for 2019 through the date of the audit and each of the annual inspections

[6] In addition to the four permits cited herein, the contractor constructing the road to the Gil site has a Construction General Permit, which regulates stormwater discharge. The contractor's permit is in that company's name. It overlaps the FGMI's coverage under the Fort Knox and MSGPs. That permit was not part of the audit, though all stormwater discharge from that area is covered in Fort Knox stormwater authorizations and are a part of the audit.

were reviewed. For the three general permits, two randomly selected weekly inspections for 2024 and 2023 and the annual inspection for 2023 were reviewed. For each inspection reviewed, the inspector's appropriate training was demonstrated by including the Certified Erosion and Sediment Control Lead (CESCL) certification number on the inspection form. When the inspector noted that maintenance was required, the audit team followed up with the subsequent inspection to confirm that the maintenance or reconstruction was completed. Also, the audit team reviewed ADEC's Gil inspection report dated October 13, 2022 and the associated Notice of Violation (NOV) and response.

3.3 Interviews

The audit team did not interview ADEC employees from the stormwater program with the ADEC Division of Water.

3.4 Field Review

The audit team reviewed four BMPs: two stormwater BMPs leading to outfall locations from the road to the Freshwater Reservoir and two BMPs along the Gil Road. The outfalls had rock check dams, which also served as silt filters, and there were also multiple sumps with a rock dam connector. It did not appear to have rained significantly before the audit field inspection. All the BMPs were in good shape, and the sumps had significant capacity. Two of the four BMPs observed during the field inspection were traced to the outfall, which did not show any evidence of significant sediment deposition.

3.5 Conclusion

The BMPs reviewed during the field inspection appeared to be well engineered and well maintained. The inspection report review identified no problems or BMPs with recurrent problems. Overall, the stormwater program appears to be well run, and the audit identified no significant problems, except for the minor issue that generated the following recommendation.

Section 2.2.4.2. of Permit AK0053643 requires that the "BMP Committee is required with a certified statement that the BMP Plan fulfills the requirements set forth in this permit...The statement must be submitted to DEC on or before January 31st of each year." Each winter, FGMI reviews the BMP Plan and updates it, which is a sound practice. Each year's BMP Plan includes the certification statement required by the permit. However, the review of the BMP Plan is not always completed before January 31. This is not a substantive problem; the site is frozen during the winter. However, including the certification statement in the updated BMP Plan means that it is not sent to ADEC before the January 31 deadline. Therefore, we recommend that either the certification review occur in January and a certification statement is sent to ADEC before the deadline or that the BMP Plan is updated each year before January 31 and sent to ADEC.

4 Point Source Water Discharge

This section provides the results of the Fort Knox Environmental Audit with respect to the mine's point-source water discharge authorized by the ADEC.

4.1 Jurisdiction

ADEC regulates discharge into waters of the U.S. under delegated authority from the USEPA. With respect to point source discharge, ADEC authorized Fort Knox to discharge at two outfall locations: R001 and R002; both are channels of Fish Creek upstream from the wetland complex. The discharge authorization is conveyed in APDES Individual Permit AK0053643. The Permit became effective on June 1, 2018. Modification #1, which took effect on June 1, 2020, increased the allowable flow rates. The Permit and authorization expired on May 31, 2023. Fort Knox applied for the permit renewal on November 30, 2022 (which was within the appropriate window), and the current Permit has been administratively extended as documented by a letter from ADEC dated December 13, 2022.

APDES Permit AK0053643 authorizes both point-source and stormwater discharges. The audit results concerning stormwater are summarized in Section 3. The Permit requires Fort Knox to measure the effluent from the outfalls under several schedules, ranging from continuous to annual, as provided in Table 4-1.

Table 4-1. APDES Monitoring Schedule for Outfalls R001 and R002.

Parameter	Effluent limit or monitor?	Frequency
antimony, arsenic, chloride, nitrate & nitrate as N, sulfate	monitor only	quarterly
cadmium, copper, cyanide, lead, mercury, pH, zinc	effluent limit	weekly
WET test	monitor only	annually
Volume	annual limit	continuously

Fort Knox is also required to monitor receiving water for eight parameters at the freshwater reservoir spillway. Fort Knox has not discharged from Outfall R001 during the audit reporting period. Therefore, this audit focused on compliance documentation associated with Outfall R002.

Other permit requirements include[7]:

- An up-to-date Quality Assurance Project Plan (ongoing requirement).
- Discharge Monitoring Report (monthly)
- Annual Water Quality Monitoring Report (by March 1st of each year)
- Oral and written documentation of noncompliance (as necessary)

[7] The list includes only requirements active during the audit period from April 2019 to the present. One-time requirements, such as notifications due when the Permit was issued (i.e., before April 2019), are not included. The APDES Permit also requires a BMP Plan for control of stormwater. BMP Plan requirements are discussed in Section 4 of this report.

4.2 Document and Record Review

The primary proof of compliance with APDES point source requirements is the water quality reporting. Table 4-2 shows the APDES requirement and the sample records selected by the audit team for review during the field inspection.

Table 4-2. APDES Requirements and Samples Reviewed.

Requirement	Sample Reviewed by the Audit
A monthly report of the average and maximum metal concentration measurements made that month.	2 months for each of the 5 years of the audit: 2019-2024 (except three were reviewed in 2023).
Quarterly submission of the receiving water, water quality results	One submission for each year
Annual water quality report	2 of the 5 years
Annual WET test results	2 of the 5 years

The audit team picked monthly reports to review (Discharge Monitoring Reports [DMRs]) using a random number generator (e.g., picking a number from 1 through 12 for the reports submitted annually, 1 through 4 for the quarterly reports). For each of the monthly reports, the audit team then reviewed the lab report from the primary lab, ACZ Laboratories Inc (ACZ), for one of the weekly measurements in that month to ensure that the lab results matched the submission to ADEC and that the minimum quantification level was at or less than the water quality standard. The audit team also reviewed duplicate samples, which were submitted to a different lab (ALS Environmental [ALS]). Findings of this review determined that the ALS results were similar enough to the ACZ results. Chain-of-custody signatures were also inspected, and it was confirmed that the FGMI staff that collected the samples had received the appropriate training.

4.3 Interviews

The audit team interviewed Tim Pilon, Engineer 2 with the ADEC Division of Water. Mr. Pilon is responsible for ADEC permit issuance and analysis. Mr. Pilon confirmed the APDES permit and referred the audit team to ADEC's online Electronic Document Management System (EDMS) to access letters to and from Fort Knox/ADEC including inspection reports. The audit team also discussed APDES violations that occurred during the audit period (discussed below). When asked for specific concerns, Mr. Pilon suggested that the audit team review the financial assurance to ensure it is adequate, though he clarified that he did not have any specific concerns with the financial assurance.

ADEC has a policy of inspecting individual APDES permits, such as the Fort Knox discharge permit, once every 2 years. During the audit period, ADEC inspected the site on February 2, 2020 and May 16, 2022. Three violations occurred during that period:

- September 2019: An exceedance of weak-acid dissociable (WAD) cyanide and failure to correctly submit notices of non-compliance. The exceedance resulted in an ADEC NOV and eventually a Compliance Order by Consent (COBC), which became effective on November 12, 2020. The COBC included a fine of $15,071 and a requirement to submit three deliverables.

- May 2020: FGMI reported a copper exceedance in the outfall.
- April 2022: ADF&G and FGMI found five dead grayling in the receiving water 0.5 mile downstream from Outfall 2. FMGI paused the outfall, took water samples, and found a WAD cyanide exceedance in that area of the receiving water.

The COBC and other ADEC-required mitigation criteria have been met, and Outfall 2 was discharging during the site visit.

4.4 Field Review

The audit team observed Outfall 2, which was discharging at the time of the site visit. The reverse osmosis buildings were not entered during the audit.

4.5 Conclusion

4.5.1 Metals Reporting

The audit team did not find any anomalies or errors in the reporting. All lab reports and duplicates matched the submissions and were within permit effluent limits. The duplicate lab results matched the ACZ lab results within appropriate tolerances. The chains of custody were signed by employees with appropriate training.

4.5.2 WET Tests

For both annual WET test results that were reviewed, FGMI submitted two samples, though only one was required. In both cases, both samples were analyzed and passed. However, one sample included the notation that it was analyzed beyond the required holding time, though the report did not say how far beyond the holding time, and the other did sample did not have that notation.

The APDES Permit specifies (Section 1.4.4.2): “If logistical problems beyond the control of the permittee prevent the timely delivery of a sample to the laboratory, the permittee may collect only two samples for WET testing and the acceptable sample holding times can be extended from 36 to 48 hours.” Because the second sample was not subject to the holding time exceedance, the results appear to comply with quality assurance objectives. However, USEPA procedures allow a permittee to ask for an extension of the holding time up to 72 hours after making certain comparisons to ensure that the requested holding times do not bias the test.[8] Given that both WET test results had one sample analyzed beyond the holding time, we recommend that FGMI conduct the required comparisons and, if appropriate, request a variance to extend holding times to enable FGMI to consistently meet the schedule. From the audit team’s experience, WET test holding times are a common problem in Alaska because the water must be shipped out of state.

[8] USEPA. 2002. Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition (EPA/821-R-02-013). October. (Referenced in Section 1.4.4.2 of the APDES Permit. See Section 8.7.1 of the manual.)

4.5.3 Quality Assurance Project Plan

The audit team reviewed the current Quality Assurance Project Plan (QAPP) required by the permit: specifically, the August 2019 Quality Assurance Project Plan and Field Procedures Manual. The QAPP appeared to be adequate with quantification limits and procedures that match ADEC requirements. The audit team also interviewed one of the technicians who performs the water quality sampling. The technician was asked to describe the procedures she used to help the audit team ensure that the QAPP procedures were followed in the field. The sampler was able to describe the procedures in detail.[9] Her description is consistent with the QAPP and provided confidence that QAPP procedures were followed in the field.

4.5.4 Overall Conclusions

Based on discussion with ADEC personnel, interviews with FGMI personnel (including an interview with one of the sampling technicians), review of the permit, review of a sample of the submitted records and the internal FGMI records that support the submissions, and review of the QAPP, FGMI is in compliance with permit terms and procedures for the APDES point source discharge. The audit team reviewed the three NOVs, including with ADEC personnel, and confirmed that they had been successfully resolved with ADEC. One recommendation regarding extending the holding times for the WET test was provided in Section 4.5.4.

One component of the point-source discharge is worth emphasizing. FGMI pays for and works with ADF&G on a monitoring system that goes far beyond typical industry compliance monitoring. ADF&G conducts a biomonitoring system in the wetland complex and freshwater reservoir downstream from the mine's discharge point. The biomonitoring system monitors the health of the aquatic ecosystem by monitoring the health and populations of the fish and benthic environment. While ADEC and other agency monitoring determine whether Fort Knox is in compliance with the permits, the biomonitoring system determines whether permit standards protect the environment. This monitoring system is not required by any permit but is quite powerful. The specifics of the monitoring system were not reviewed.

5 Water Use

This section provides the results of the Fort Knox Environmental Audit with respect to water use authorizations issued by the ADNR.

5.1 Jurisdiction

ADNR regulates water withdrawal under the Alaska Water Use Act, AS 46.15.010-270. Under the Act, ADNR issues two types of authorizations: a water right, which is a property right to withdraw or divert water, and a

[9] The audit team also asked the technician if she performed the stormwater field inspections and sampling. She replied that she was not trained in those procedures and, therefore, could not conduct them. That response also gave the audit team confidence that the sampling was performed consistent with required procedures and training.

temporary water use authorization (TWUA), which is a temporary authorization to do the same. A TWUA is not a property right. TWUAs expire, while water rights do not.[10]

Both water rights and TWUAs carry generally applicable stipulations (e.g., Follow acceptable engineering practices...), and they may carry special stipulations relevant to that water withdrawal or diversion. The water rights also require FGMI to report water use to ADNR annually; the TWUAs do not carry this requirement.

This audit reviewed whether FGMI had submitted annual water use data when required, whether it complied with any special stipulations for that permit, and whether any active authorizations had expired.[11]

The audit team reviewed the authorizations identified in Table 5-1.

Table 5-1. Water Rights and Temporary Water Use Authorizations Reviewed.

ADNR File #	Expiration Date	Water Source	Maximum Withdrawal	Purpose/Use
Water Rights				
ADL 47229	Certificate Issued	Fish Creek	1,608.59 AFY	Fish Creek Water Reservoir for Millsite
LAS 13986	Certificate Issued	Fish Creek	456.57 AFY	Fish Creek Water Reservoir for Mining and Milling (Certificate also has maximum reservoir volume)
LAS 13987	Certificate Issued	Interceptor Wells	724 AFY	Mining and Milling
LAS 13988	Certificate Issued	Fish Creek	5,245.00 AFY	Mining and Milling including Heap Leaching
LAS 21760	Certificate Issued	Dewatering Well Field(s)	1,600.00 AFY	Mining and Milling
LAS 28158 Permit	8/23/27	Dewatering Well Field(s)	4,045.00 AFY	Mining and Milling Operations
LAS 28160 Permit	8/23/27	Drilled Wells	3,000.00 AFY	Mining and Milling Operations
LAS 28161 Permit	12/27/27	Tailings Storage Facility	13,255.00 AFY	Mining, Milling, and Heap Leach Operations
LAS 33002 Permit	1/13/30	Tailings Storage Facility	20,000.00 AFY	Tailings Storage Facility
Temporary Water Use Authorizations				
F2020-005	12/31/24	Several Creeks	14,400 gpd	Exploration Drilling and Trenching for Gil Exploration
F2020-006	12/31/24	Gil Main & Sourdough Wells	14,400 gpd	Exploration Drilling and Trenching for Gil Exploration
F2022-009	9/14/27	Twin, Pedro, and Deadwood Creeks	14,400 gpd	Exploration Drilling

5.2 Document and Record Review

The audit team reviewed each of the water use authorizations in Table 5-1. It also reviewed the annual use records submitted to ADNR to ensure that they were within the water right and TWUA limits. The water right use is reported in the Fort Knox annual report. The audit team reviewed the 2019, 2021, 2022, 2023, and 2024 annual

[10] ADNR may revoke a water right for nonuse.
[11] Authorizations also frequently include specifications to screen the withdrawal opening to avoid entraining or impinging fish. This requirement originates with ADF&G responsibilities and is usually carried on the ADF&G Title 16 permit for the same water withdrawal. Compliance with this requirement is covered in Section 10 of this report concerning ADF&G authorizations.

reports, which are available on the ADNR website. The 2020 annual report is listed on the website, but the actual linked report is the Fort Knox report to ADEC under the WMP, and the 2020 report does not appear to be available on the website.

FGMI reports water use by source in the annual reports. Multiple authorizations may authorize withdrawal from the same source. The review showed that water use for the 5 years reviewed was within the authorization limits.

5.3 Interviews

Two members of the audit team interviewed Jenny March, Natural Resource Specialist 3, with ADNR's Division of Mining, Land and Water, Water Section. One of the team members followed up with Ms. March by phone afterward. Ms. March is one of the ADNR staff who handles Fort Knox water use issues. Ms. March confirmed that the audit team had the correct authorizations and indicated that ADNR did not have concerns regarding FGMI's water use under those authorizations.

5.4 Field Review

The audit review for water use is solely a records review; no field inspections were conducted with respect to water use.

5.5 Conclusion

FGMI complies with its water rights and TWUAs. This conclusion is based on discussion with ADNR personnel, interviews with FGMI personnel, review of the water rights and TWUAs, and the water use records submitted to ADNR. The audit team has no recommendations for changes to comply with these authorizations.

6 Reclamation and Closure Plan and Financial Assurance

FGMI has prepared an updated RCP and amendments (Amendment 1 - Revision 1, May 2021 and Amendment 2 – Gil Project Addition, Revision 1, May 2021) in accordance with state and federal regulations. The RCP has been updated from previous versions to address changes to the mine plan and proposed closure strategies since the previous RCP submittal. FGMI has updated and revised the RCP to address reclamation, monitoring, and post-mining land use for the Fort Knox Mine. Specifically, Amendment 1 included expansion of the lease boundary with addition of the Victoria Creek Waste Rock Dump, and Amendment 2 included development of the Gil Project.

As part of this RCP, FGMI is required to develop an estimate of reclamation and closure costs. As noted in Section 5 of the RCP, and per AAC 97.400, FGMI is required to post a bond to demonstrate financial assurance. This bond corresponds to the largest probable liability based on current mine operations and plans for reclamation and closure. As of 2022 (approved by ADNR and ADEC in November 2022), FGMI holds a bond for the Fort Knox Mine and Gil Mine in the amount of $102,235,000.00. The financial assurance cost estimate, which serves as the basis for the bonded amount, was developed using the Standardized Reclamation and Closure Estimator (SRCE) software tool.

6.1 Jurisdiction

The following regulations apply to the RCP and financial assurance:

- ADNR, Division of Mining Under AS 27.19.010 et. seq. and 11 AAC 97.100 et. seq;
- ADEC, Division of Water, as required by Waste Management Permit 2014-DB0002, Modification #2; and
- U.S. Army Corps of Engineers (ACOE) as required by the Clean Water Act Section 404 Permit No. N-920574, Fish Creek.

6.2 Document and Record Review

The audit team reviewed the current RCP, the two amendments, and the Microsoft Excel-based SRCE spreadsheet files associated with the RCP and amendments. The findings of these reviews were the basis for determining field evidence of accuracy and completeness of the RCP and amendments. In addition to the document review, a representative sampling of operational records in support of the RCP and amendments was completed while on site and complemented with interviews of relevant areas of understanding.

Arcadis also reviewed the SRCE financial assurance model, including Appendix E of the RCP, Appendix B, for each of the two amendments and the three SRCE Excel-based workbooks associated with the RCP and both amendments. This review included a high-level evaluation of the overall adequacy of the financial assurance, including a review of each cost component included in the SRCE model, to ensure that the bonded amount is not grossly underestimated and that all major cost components are included. This review did not include a line-by-line verification and validation of the specific costs estimated by FGMI, as this detailed of a review was considered beyond the scope of the audit.

6.3 Interviews

FGMI employees and representatives from the FGMI Environmental Department were interviewed regarding the completeness and accuracy of the information in the RCP. FGMI employees included Brent Culleton, Eddie Packee, Muradur Rashedin, Jessie Dunshie, and David Stewart. Additional interviews were completed before the on-site audit with representatives from the ADNR, Division of Mining, Large Mines Program. ADNR representatives included William Grom, Aaron Cruz, and Carolyn Curley.

6.4 Field Visit

Multiple field visits were conducted during the on-site audit. These included all facilities in the process flow of the mining including mill and operational support facilities (maintenance shops, department offices and trailers, petroleum storage and dispensing, conveyors and stockpiles); TSF; decant and seepage water infrastructure; water reservoir; Walter Creek and Barnes Creek heap leach systems; open pit mine; waste rock dumps; haul roads; and the Gil Project site including open pit mines, waste rock dumps, truck shop, refueling and maintenance area and haul roads.

6.5 Conclusion

6.5.1 Reclamation and Closure Plan Document Observations

Based on the findings generated from the audit process (consisting of document and record review, interviews to further the understanding of the specific program parameters and field visit to identify evidence of compliance or non-compliance), the RCP and amendments appear to be accurate and complete. Minor differences consisting of omission or specificity of deleterious details are communicated and discussed during submittal of annual reports to ADNR Division of Mining, Large Mines Program or site visits and inspections by ADNR Division of Mining. The operations and management of the site appear to be well engineered and well maintained.

6.5.2 Financial Assurance Cost Estimate Review

Arcadis noted that the financial assurance estimates and associated bond were based on FGMI's assessment of the "largest probable liability" with respect to the project life. FGMI estimated the largest potential liability to correspond to a 2020 premature closure scenario (updated to 2021 with Amendments 1 and 2) because liabilities and costs were estimated to decrease as mining progressed. Specifically, the RCP includes ongoing closure to be conducted during operations, which are anticipated to offset additional liabilities associated with continued mining through 2027, milling through 2022, and heap leaching through 2030.

Arcadis believes that the 2021 premature closure assumption for developing the financial assurance was reasonable based on the plans and assumptions current as of the January 2020 RCP and the May 2021 amendments. We also believe that the financial assurance and bond estimate were reasonable at the time, with no major omissions that would have resulted in a significant underestimation of reclamation costs. However, based on additional project activities since 2021, and based on the future outlook for the Fort Knox and Gil Projects, it is evident that an update to the RCP (along with a re-evaluation of the financial assurance) is necessary. Arcadis understands that FGMI is fully aware of this need, and that FGMI is currently updating the RCP and financial assurance for submission to ADEC and ADNR in late 2024 or early 2025.

Arcadis provides the following observations based on review of the RCP, RCP amendments, and SRCE documents within the context of the on-site observations and conversations with FGMI staff during the audit. These comments should be considered when updating the RCP and financial assurance.

- Appendix E of the RCP, which outlines the components of the cost estimate, is light on specific detail of the cost components. The SRCE model itself is comprehensive, but it is challenging for the purposes of reviewing cost components because many of the details are spread among multiple tabs in the SRCE model. As an example, Arcadis and FGMI discussed the need for horizontal drilling to provide free drainage from the Walter Creek Heap Leach Pad to the open pit after closure. These cost components were found in the model; not in the “Solution Management” or “Heap Leach” tabs, but in the “Other User” tab, while Appendix E does not mention this component. Arcadis is not suggesting restructuring of the SRCE tool, but FGMI may consider including a more comprehensive table in Appendix E as a more intuitive way to evaluate the individual cost components. An example table is included below, which Arcadis developed when checking the SRCE model components.

- While on site, FGMI and Arcadis discussed the need for buttressing the Walter Creek Heap Leach Pad to enhance the stability of the pad in the event of an earthquake up to magnitude 7.5. Although the SRCE model is very detailed with respect to earthwork requirements for covering waste rock, heap leach pads, and the TSF, the cost for earthwork for installation of the heap leach pad buttress do not appear to be explicitly included in the model.
- The current financial assurance model assumes that long-term water treatment will not be required. Specifically, although water quality within the open pit would not meet water quality standards in the short term during filling with discharge of heap leach pad draindown and TSF pumpback, the RCP assumes that constituent concentrations within the open pit will be below water quality standards by the time the open pit fills to the point of overflow to the alluvium. Although this has historically been a reasonable assumption, the most recent Pit Lake Study has suggested some uncertainty in the long-term concentrations of some constituents including antimony and arsenic. There is, therefore, a possibility that some water treatment may be required in the future, depending on (for example) the nature and volumes of additional mill feeds to Fort Knox, which may affect pit lake chemistry as mill tailings are deposited in the pit.
- The SRCE model includes costs for demolition of buildings and foundations with surface reclamation (including growth media placement). However, costs are not explicitly included for cleaning/decontamination, hazardous waste disposal, or disposal permitting. It is unclear whether the building/wall/slab demolition line item ($3.91 million) includes this cost. This component will be required, particularly for any equipment contacting cyanide.
- The March 31, 2023, POA (Manh Choh Satellite Mine Ore Processing) included installation of new infrastructure at the mill. These components are an example of what will need to be included in the updated RCP and financial assurance.
- The 2020 RCP and amendments suggest that there is currently a surplus of growth media for covering mine site disturbances. However, during the audit, FGMI staff suggested that there may not be enough growth media at Fort Knox to meet the demand. Although FGMI stated that any shortage could be made up with additional growth media from Gil, the cost for transport of growth media may need to be incorporated in the updated financial assurance.
- The geologic description of the Gil Project (RCP Amendment 2) describes the greater abundance of pyritic material, including arsenopyrite, relative to Fort Knox. FGMI acknowledges the potential for lower-quality waste rock (with potential for metals leaching) at Gil relative to Fort Knox. However, at the time of submission of Amendment 2 for the Gil Project, the geochemical characterization study for Gil was not yet complete, and Amendment 2 (Section 4.2) states: "*…pending results of the waste rock analysis, the water management scheme, waste rock storage and pit water management may be modified to address potential water impairment. The cost for physical reclamation for haul roads and waste rock facilities will likely remain similar, however long-term water management and treatment costs could increase… The treatment assumption will be revisited when the potential for ARD and ML is determined.*" During the audit, FGMI stated that the geochemical characterization study was not yet complete but was being completed in late 2024. The need for water treatment at Gil will need to be evaluated. Arcadis noted during the audit that reverse osmosis (RO) is currently being used for localized water treatment at the site. Importantly, if water treatment does become necessary at Gil, RO would likely not be a suitable technology due to the lack of long-term, sustainable options for brine disposal, and alternative treatment and/or waste rock segregation strategies may be required.

- Finally, the following additional minor points were noted for inclusion in the updated RCP and financial assurance in late 2024/early 2025:
  - The outcome of wetland permitting for the Gil Project, as these wetland permits were not in place at the time Amendment 2 was approved. Specifically, Section 3.1 states: “Wetlands have been identified and mapped in the development footprint and the surrounding area… FGMI is currently working with the Corps of Engineers on permit and mitigation measures.”
  - During the audit, multiple structures were observed associated with the Gil Project; however, Amendment 2 did not include details and costs for demolition of these structures. For demolition, the Amendment 2 SRCE model only includes removal of fuel tank distribution pipe. The updated RCP and financial assurance should include demolition of Gil structures (including decontamination and/or hazardous waste disposal and permitting as necessary).
  - The Haul Materials tab of the SRCE model assumes that rip rap for drainage channels can be derived from Gil waste rock. However, based on the poor rock type and geotechnical properties of the majority of the Gil waste rock, this assumption may need to be revised.

The audit team conducted a quality control check on the individual cost items within the SRCE model. The first 13 out of 24 components of the review are included in Table 6-1 (the categories in this table are the same as those in Table 8-1 of the RCP). This check confirms that individual line items properly add up to the summed total in the “Acct Code” SRCE model tab. As noted above, a more detailed table such as this may be useful for inclusion in the financial assurance appendix of the updated RCP.

Table 6-1. Financial Assurance Components from the SRCE Model (Not Comprehensive).

		Reclamation Cost Item	Estimated Cost	SRCE Model Tab
1	Waste Rock Dumps			
		Yellow Pup, Fish Creek, and Barnes Creek (Labor, Equipment, Materials)		
		Recontouring to 3:1 slopes (actually 2 to 2.5)	$4,515,244	Waste Rock Dumps
		12" growth media cover placement.	$3,139,989	Waste Rock Dumps
		Scarifying/Ripping	$228,791	Waste Rock Dumps
		Revegetation	$465,860	Waste Rock Dumps
		Summed	$8,349,884	
		Value from Acct Codes Tab	$8,349,884	Acct Codes
2	Heap Leach Pads			
		Walter Creek and Barnes Creek (Labor, Equipment, Materials)		
		Solution management from HLPs covered under Item 3.		
		Walter Creek + Barnes Creek regrading	$296,525	Heap Leach
		12" growth media cover placement.	$2,338,997	Heap Leach
		Scarifying/Ripping	$158,776	Heap Leach
		Revegetation	$322,910	Heap Leach

		Reclamation Cost Item	Estimated Cost	SRCE Model Tab
		Summed	$3,117,208	
		Value from Acct Codes Tab	$3,117,208	Acct Codes
3	Solution Management			
		Pumping (incl labor)	$4,223,063	Solution Mgmt
		Excavate trench for 12" pipe for solution management - Walter Creek	$5,795	Other User
		Install 12" pipe for solution management - Walter Creek - buried	$188,570	Other User
		Cover trench for 12" pipe for solution management - Walter Creek	$5,795	Other User
		Install 12" pipe for solution management - Walter Creek - HDD	$150,856	Other User
		Horizontal drilling for solution management pipe - Walter Creek - drill through fill	$578,088	Other User
		Horizontal drilling for solution management pipe - Walter Creek - drill through hard rock	$1,536,980	Other User
		Horizontal drilling for solution management pipe - Barnes Creek - drill through fill	$115,618	Other User
		Horizontal drilling for solution management pipe - Barnes Creek - drill through hard rock	$461,094	Other User
		Remote monitoring of TSF seepage to pit (2023-2054)	$330,000	Other User
		Pipe installation costs - TSF North Pond to South Pond - 2020 - diameter 8 in.	$190,993	Other User
		Pipe installation costs - TSF South Pond to Pit - 2020 - diameter 16 in.	$1,041,517	Other User
		Pipe installation costs - HLP Draindown - Walter Creek HLP - 2020 - diameter 8 in.	$298,054	Other User
		Pipe installation costs - HLP Draindown - Barnes Creek HLP - 2020 - diameter 8 in.	$917,109	Other User
		Pipe installation costs - TSF seepage to Pit - 2020-2022 - diameter 4 in.	$560,979	Other User
		TSF seepage to Pit - 10-year pipeline replacement - 2030	$280,490	Other User
		TSF seepage to Pit - 10-year pipeline replacement - 2040	$280,490	Other User
		TSF seepage to Pit - 10-year pipeline replacement - 2050	$280,490	Other User

		Reclamation Cost Item	Estimated Cost	SRCE Model Tab
		Heat trace installation	$84,362	Other User
		Heat trace operations costs - closure period	$68,055	Other User
		Heat trace operations costs - post-closure period	$725,925	Other User
		Long-term solution management technician (InfoMine p. A6, water treatment plant operator IV)	$1,344,043	Human Resources
		Summed	$13,668,364	
		Value from Acct Codes Tab	$13,668,364	Acct Codes
4	Pit			
		Safety Berm	$39,449	Pits
		Revegetation	$48,302	Pits
		Pit signage	$33,882	User 09 Pit signs
		Pit lake water quality prediction updates (assumes 7)	$175,000	Closure Planning
		Pit Pre Strip Area: Scarifying	$20,053	Yards, Etc.
		Pit Pre Strip Area: Revegetation	$23,241	Yards, Etc.
		Summed	$339,927	
		Value from Acct Codes Tab	$339,927	Acct Codes
5	Yards			
		Assumes no regrading needed		
		Fish Creek Area Regrade: Growth media haul to placement	$428,577	Yards, Etc.
		Fish Creek Area Regrade: Growth Media	$332,048	Yards, Etc.
		Scarifying/Ripping	$108,155	Yards, Etc.
		Revegetation	$121,796	Yards, Etc.
		Summed	$990,576	
		Value from Acct Codes Tab	$990,576	Acct Codes
6	Roads			
		Regrading	$26,575	Roads
		Scarifying/Ripping	$22,468	Roads
		Revegetation	$48,242	Roads
		Regrading	$8,949	Expl. Roads & Pads
		Scarifying/Ripping	$1,385	Expl. Roads & Pads
		Revegetation	$6,011	Expl. Roads & Pads
		Summed	$113,630	
		Value from Acct Codes Tab	$113,630	Acct Codes

		Reclamation Cost Item	Estimated Cost	SRCE Model Tab
7	Borrow Area			
		Scarifying	$32,546	Yards, Etc.
		Revegetation	$36,839	Yards, Etc.
		Summed	$69,385	
		Value from Acct Codes Tab	$69,385	Acct Codes
8	Tailings			
		Regrading (surface)	$21,697	Tailings
		Growth media haul to placement	$5,388,698	Tailings
		Growth media (surface + embankment)	$2,993,721	Tailings
		Revegetation	$243,894	Tailings
		Dam Security Gate Install	$6,565	Other User
		TSF Phase 1 Causeway Breach	$989,079	Other User
		Pearl Creek Causeway Breach	$31,651	Other User
		Summed	$9,675,304	
		Value from Acct Codes Tab	$9,675,304	Acct Codes
9	Buildings			
		Text assumes offsite disposal		
		Building/wall/slab demo	$3,908,721	Foundations & Buildings
		Growth media	$35,446	Foundations & Buildings
		Scarify & reveg	$12,912	Foundations & Buildings
		Summed	$3,957,079	Foundations & Buildings
		Value from Acct Codes Tab	$3,957,079	Foundations & Buildings
10	Other Demo			
		Misc; hours for labor and equipment only	$596,045	Other Demo & Equip Removal
11	Sediment and Drainage Control			
		This is described as "Channels" (Section 2.16) in the report.		
		Conveyance Channels for North Wetland System	(summed below)	Sediment & Drainage Control
		TSF Channel	(summed below)	Sediment & Drainage Control
		WC-1 Channel	(summed below)	Sediment & Drainage Control
		WC-2 Channel (riprap >18')	(summed below)	Sediment & Drainage Control
		BC-1 Channel	(summed below)	Sediment & Drainage Control

		Reclamation Cost Item	Estimated Cost	SRCE Model Tab
		BC-2 Channel	(summed below)	Sediment & Drainage Control
		BC-3 Channel	(summed below)	Sediment & Drainage Control
		C-1 Channel	(summed below)	Sediment & Drainage Control
		YP-1 Channel	(summed below)	Sediment & Drainage Control
		Excavation	$61,182	Sediment & Drainage Control
		Rip rap install	$9,331,838	Sediment & Drainage Control
		Revegetation	$7,881	Sediment & Drainage Control
		Wetland ponds (fish creek restoration)	$45,245	Sediment & Drainage Control
		Blasting for Riprap	$2,127,213	Other User
		Generic Material Hauling	$1,361,993	Haul Material
		Summed	$12,935,352	
		Value from Acct Codes Tab	$12,935,352	Acct Codes
12	TSF Spillway			
		Diversion ditch installation	$46,501	Sediment & Drainage Control
		Riprap (labor, equipment, material)	$2,870,628	Sediment & Drainage Control
		Summed	$2,917,129	
		Value from Acct Codes Tab	$2,917,129	Acct Codes
13	Linear Structures			
		Culvert & Buried Pipe	$5,814	Misc. Costs
		Surface Pipe Removal	$1,028,587	Misc. Costs
		Power Line/Substation	$565,722	Misc. Costs
		Substation removal	$50,000	Other User
		Summed	$1,650,123	
		Value from Acct Codes Tab	$1,650,123	Acct Codes

7 Millsite Lease

This section provides the results of the Fort Knox Environmental Audit with respect to the current Millsite Leases issued by the State of Alaska acting by and through the ADNR.

7.1 Jurisdiction

The State of Alaska has jurisdiction of the Millsite Leases:

- ADNR, acting by and through the Division of Mining, Land, and Water pursuant to AS 38.05.255; and
- Alaska Mental Health Trust Authority, a public corporation within the Alaska Department of Revenue (AS47.30.011 et seq) acting by and through the Mental Health Trust Land Office within ADNR pursuant to AS 37.14.009(a)(2) and AS 38.05.801.

7.2 Document and Record Review

The following documents and records were reviewed during the audit:

- Fairbanks Gold Mining, Inc., Millsite Permit Fort Knox Mine Project, ADL Nos. 414960 and 414961, February 15, 1994;
- Fairbanks Gold Mining, Inc., Amended and Restated Millsite Lease, Fort Knox Mine Project (amending and restarting the Millsite Permit effective as of February 15, 1994, as amended and supplement), ADL Nos. 414960 and 414961, July 8, 2002;
- Fairbanks Gold Mining, Inc., Addendum to Amended and Restated Millsite Lease, Fort Knox Mine Project (amending the Millsite Lease that was effective January 1, 2002), ADL Nos. 414960 and 414961, July 3, 2007;
- Fairbanks Gold Mining, Inc., Addendum to Amended and Restated Millsite Lease, Fort Knox Mine Project (amending the Millsite Lease that was effective January 1, 2002), ADL Nos. 414960 and 414961, July 3, 2007;
- First Amendment to Millsite Lease ADL 414960 and 414961, December 31, 2007;
- Second Amendment to Millsite Lease ADL 414960 and 414961, May 23, 2011;
- Third Amendment to Millsite Lease ADL 414960 and 414961, June 1, 2011;
- Change 1 to Third Amendment to Millsite Lease ADL 414960 and 414961, May 16, 2019; and
- Fairbanks Gold Mining, Inc., Gil Millsite Lease ADL 233700 May 26, 2021.

7.3 Interviews

Interviews conducted specifically for the Millsite Leases were based on those conducted during the other programs audited and documented in this report.

7.4 Field Visit

Multiple field visits were conducted during the on-site audit. These included all facilities in the process flow of the mining including mill and operational support facilities (burn pit, waste storage facility, maintenance shops,

department offices and trailers, petroleum storage and dispensing, conveyors and stockpiles); TSF; decant and seepage water infrastructure; water reservoir; Walter Creek and Barnes Creek Heap Leach systems; open pit mine; waste rock dumps; haul roads; and the Gil Project site including open pit mines, waste rock dumps, truck shop, refueling and maintenance area and haul roads.

7.5 Conclusion

Based on the findings of the audit process (consisting of document review, interviews to further the understanding of the specific program parameters, and field visit to identify evidence of compliance or non-compliance), the Millsite Leases, amendments, and changes appear to be accurate and complete and are supported by the compliance of the other audited programs in this report. It should be noted the audit did not review tax records or confirm that Lease fees have been paid and are current.

8 Dam Safety

This section provides the results of the Environmental Audit with respect to jurisdictional dams authorized by ADNR.

8.1 Jurisdiction

ADNR regulates the construction and operation of dams under the Alaska Dam Safety Act, AS 46.17, and regulations 11 AAC 93.150-201. Fort Knox has five jurisdictional dams: the Tailings Facility Dam, the Freshwater Reservoir Dam, the Walter Creek Heap Leach Dam, the Barnes Creek Heap Leach Dam, and the Pearl Creek Causeway.[12] Of these, only the TSF is classified as a Class I, high-hazard dam. Because of time constraints, this audit team concentrated its focus on the Tailings Dam.

The Fort Knox Tailings Dam (NID ID#AK00212) began operation in 1996, and it will remain in place at the end of mine life. It is a zoned earthfill and rockfill dam. It has been subjected to several raises, and FGMI is preparing for another raise.

8.2 Document and Record Review

The audit team reviewed the Operations and Maintenance Manual (Rev. 8, August 2019) to help guide the records review. It reviewed samples of the inspection reports and data for the highest-priority maintenance records for the dam. Specifically, the team reviewed the following: a randomly selected sample of weekly tailings dam inspections (two inspections in 2023 and two in 2024), the monthly record of stability monument survey (2019 audit), the interceptor well and pumpback well records (note that seepage monitoring is a calculated value

[12] The Pearl Creek Causeway is intermittently classified as a dam. It is currently classified as a dam, though the water behind the dam can flow through culverts to the main tailings facility. It is regulated as a dam because tailings stacked upgradient of the causeway within the tailings facility could cause a cascading failure on the main tailings dam if the tailings were to slump into the tailings facility lake. Once the main tailings dam is raised, that will no longer be the case, and the causeway will once again cease to be a regulatory dam. This is the causeway's second temporary classification as a dam.

from those records), the compilation of piezometric data (2021 audit), and periodic annual inspections and safety inspections (2021 through 2023).[13]

8.3 Field Visit

The audit team completed a field visit to the Tailings Dam and Pearl Creek Causeway. The audit team did not complete a detailed field inspection of the dam, but a field visit showed no obvious areas of concern.

8.4 Conclusion

Based on the records review and short field visit, the audit determined that the Tailings Dam fully complies with its requirements and that FGMI follows all procedures and adequately documents information required by the ADNR permit and Operations and Maintenance Manual.

9 Fish Permits

This section provides the results of the Fort Knox Environmental Audit with respect to Fish Passage Permits under the jurisdiction of ADF&G.

9.1 Jurisdiction

Under AS 16.05.841, ADF&G requires a permit for facilities and activities within the ordinary high-water mark of resident and anadromous fish streams. There are no anadromous fish streams on the Fort Knox property, and ADF&G's regulatory activities at Fort Knox are focused on ensuring fish passage for resident fish consistent with the statute. Specifically, the Department's main regulatory focus is that culverts are installed and maintained to "be kept open, unobstructed, and supplied with a sufficient quantity of water to admit the passage of fish freely through it" (§841), and that water withdrawal is sized and screened so that the withdrawal will not impede fish passage or entrain or impinge juvenile fish in the intake.

9.2 Document and Record Review

Permits. Based on the information provided by ADF&G, the audit reviewed the permits listed in Table 9-1.

Table 9-1. ADF&G Permits Active from April 2019 to August 2024.

Permit Number	Issue Date	Exp Date	Purpose
FH18-III-0039	2/27/18	When Culverts removed	Culvert
FH18-III-0039-A1	9/9/19	When Culverts removed	Culvert
FH18-III-0039 Amendment 2	4/22/21	When Culverts removed	Culvert

[13] A period safety inspection occurs every 3 years and doubles as the annual inspection when it occurs.

Permit Number	Issue Date	Exp Date	Purpose
FH21-III-0076	4/22/21	When Culverts removed	Culvert
FH21-III-0076-Amendment 1	7/30/21	When Culverts removed	Culvert
FH21-III-0111	5/14/21	12/31/26	Water Withdrawal
FH21-III-0111-Amendment 1	5/24/22	12/31/26	Water Withdrawal
FH20-III-0026	5/20/22	12/31/24	Water Withdrawal
FH20-III-0026-Amendment 1	5/20/22	12/31/24	Water Withdrawal
FH18-III-0118	5/21/18	12/31/22	Water Withdrawal
FH18-III-0118 Amendment 1	8/25/22	8/31/27	Extended expiration date
FH15-III-0219	10/26/15	When Culverts removed	Culvert
FH15-III-0219-Amendment 1	4/22/21	When Culverts removed	Culvert
FH15-III-0219-Amendment 2	8/1/22	When Culverts removed	Culvert
FH15-III-0219-Amendment 3	8/26/22	When Culverts removed	Culvert
FH17-III-0181	10/4/17	12/31/27	Beaver Dam Removal
FH15-III-0218-Amendment 1	4/22/21	When Culverts removed	Culvert
FH15-III-0218-Amendment 2	7/22/21	When Culverts removed	Culvert

Review of Trip Reports. ADF&G personnel come to Fort Knox primarily to conduct biomonitoring in the wetland complex and the water storage reservoir. The Trip Reports document ADF&G biomonitoring and measurements; they are not regulatory inspection reports. Nevertheless, they would document problems that affect water movement and fish habitat such as beaver dams and the fish issue referenced in Section 4.

The audit team reviewed the 19 Trip Reports provided by ADF&G for the period from April 2019 through August 2024. The dates of the trips are provided in Table 9-2.

Table 9-2. ADF&G Trip Date Ranges.

Year	Date	Year	Date
2024	4/9/24	2021	4/13/21
2024	4/29/24 through 5/10/24	2021	4/15/21
2023	4/14/23	2021	4/30/21 through 5/12/21
2023	5/8/23 through 5/19/23	2021	6/4/21
2023	9/17/23 through 9/20/23	2020	4/10/20
2022	4/5/22	2020	4/24/20 through 5/9/20
2022	4/14/22	2020	5/29/20 through 10/9/20
2022	4/14/22 and 4/22/22	2019	6/25/19 through 6/27/19
2022	5/2/22 through 5/17/22		
2022	8/25/22 and 8/26/22		
2022	9/6/22 through 9/16/22		

The Trip Reports did not describe out-of-compliance regulatory issues, though it identified the single fish issue referenced in Section 4.

9.3 Interview

Two members of the audit team interviewed Audra Brase, Fish and Game Coordinator for the Interior Region of the Habitat Section with ADF&G. In addition to authority over ADF&G regulatory issues at Fort Knox, Ms. Brase is the supervisor for the biomonitoring program for the wetland and freshwater complex downstream of the mine. She printed the permits that are open or were issued since April 2019 and the Trip Reports for field visits that occurred since that time.

Ms. Brase described an excellent working relationship with Fort Knox personnel. She had no concerns relevant to the audit. She also noted there had been one incident wherein a contractor had hit and killed a moose with their truck while traveling at the site. In a second incident, documented in one of the 2022 Trip Reports, ADF&G found an unhealthy Arctic grayling downstream of Outfall 2. (This is described further in Section 4).

9.4 Field Review

The audit team field inspected a sample of the facilities authorized by the permits including two culverts and one water withdrawal site. The team reviewed a culvert authorized by FH18-III-0039-A1 and one authorized by FH21-III-0076-Amendment 1. At each site, there did not appear to be any issues (no settling or jacking, and water was flowing through unimpeded). At the water withdrawal site authorized by FH21-III-0111-Amendment 1, the audit

team was able to see the water intake from shore. The intake was in a screened box with closely spaced screening as required by the permit, though the team did not pull the intake from the water to confirm the mesh size.

9.5 Conclusion

Based on discussion with ADF&G personnel, review of the permits and Trip Reports, and a field review of a sample of the authorized facilities, FGMI is in compliance with ADF&G permits and has been in compliance throughout the audit period.

The biomonitoring conducted by ADF&G downstream of the Fort Knox discharge points is not required by any agency's permit or regulations and is outside the scope of this audit. Nevertheless, it is a powerful tool for identifying potential problems (or lack of problems) with the mine's discharge. The monitoring, frequent visits by ADF&G personnel, and the focus on the health of the downstream aquatic ecosystem can identify compliance issues as a backup to the formal ADEC compliance monitoring. It also documents whether the permit terms adequately protect the environment. The permit terms are intended to protect the downstream ecosystem; the biomonitoring confirms whether the permits' "promise" has been fulfilled.

10 Air Quality

FGMI operates under two air quality permits issued by the ADEC Division of Air Quality: Title V Air Quality Operating Permit and Title I Air Quality Control Minor Permit. FGMI's compliance with these permits and other applicable State of Alaska and federal regulations was reviewed during the audit.

10.1 Jurisdiction

The ADEC, under the authority of AS 46.03, AS 46.14, 6 AAC 50, 18 AAC 15, and 18 AAC 50, administers the air permitting program in Alaska. FGMI operates under two air quality permits issued by the ADEC Division of Air Quality: Title V Air Quality Operating Permit (No. AQ0053TVP04) issued on August 14, 2023 and Title I Air Quality Control Minor Permit (No. AQ0053MSS04) issued on December 17, 2012. These permits authorize operations at Fort Knox. According to a technical memorandum prepared by Air Sciences, Inc., the Gil Project is considered to be its own distinct stationary source due to its distance from Fort Knox. This memo also determined that potential emissions from Gil Project operations (primarily oil-fired heaters and diesel-fired generators) are below the new stationary source minor permit thresholds listed under 18 AAC 50.502 (c)(1); therefore, a permit to construct and operate was not required.

Title I Air Quality Control Minor Permit No. AQ0053MSS04

Fort Knox operates under Minor Permit Number AQ0053MSS04. Regulated fuel-burning equipment at the source includes diesel electric generators, fuel oil-burning boilers, waste oil-burning boilers, heaters, and associated fuel storage tanks that provide power, heat, process steam, and waste reduction services to the stationary source operations. Stationary source operations include rock crushers, a reclaim tunnel, lime silos, an induction furnace, and a carbon regeneration kiln. The minor permit imposes limits that reduce allowable emissions of all regulated pollutants to below 100 tons per year.

Title V Air Quality Operating Permit No. AQ0053TVP04

Although Fort Knox's allowable emissions of criteria pollutants are less than Title V major source thresholds, the facility also operates under Title V Permit No. AQ0053TVP04 because it is subject to the National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart EEEEEEE for Gold Mine Ore Processing and Production Area Sources. Per 40 CFR 63.11640 (d), the owner or operator of a source subject to NESHAP Subpart EEEEEEE must obtain a Title V air permit. Per 40 CFR 70.3 (c)(2) and 40 CFR 71.3 (c)(2), a Title V permit for a stationary source that is an area source and not subject to Title V permitting for reason other than NESHAP applicability only needs to include the requirements of the NESHAP subpart in the Title V permit and any other appliable requirements that apply to emissions units affected by the subpart. All other emission units can be excluded from the Title V permit. The affected units at Fort Knox are four 125-cubic-foot (ft^3) electrowinning cells, one 75 ft^3 electrowinning cell, one induction furnace, one carbon regeneration kiln, and two activated carbon bed adsorption vessels. The activated carbon bed adsorption vessels are used to control mercury emissions.

Fort Knox operates only carbon processes without mercury retorts and does not have any ore pretreatment processes, carbon processes with mercury retorts, or non-carbon concentrate processes. Fort Knox produces about 25 tons of electrowinning concentrate annually.

10.2 Document and Record Review

Arcadis reviewed the following documents to determine Fort Knox's compliance with the Title I Minor Permit, Title V Operating Permit, and applicable federal and state regulations:

- Monthly baghouse inspection records (induction furnace, primary & cone crusher and reclaim tunnel, lime silos);
- Daily differential pressure logs (induction furnace, primary & cone crusher, and reclaim tunnel);
- Monthly opacity readings (lime silos and carbon regeneration kiln);
- Visible emissions corrective action/deviation/maintenance logs (induction furnace, primary & cone crusher and reclaim tunnel, lime silos);
- Fuel sulfur content records;
- Emergency generator operating hours;
- Fuel oil usage for boilers and heaters;
- Used oil usage for boilers and heaters;
- Visible emissions observations for Generators 4, 5, 6, and 7;
- Visible emissions reports for Generators 4, 5, 6, and 7;
- Monthly fugitive emission visual survey records;
- Ambient Air Boundary signage semi-annual inspection records;
- Ambient Air Boundary Surveillance Plan;
- Maintenance records for MEM Heaters 1 through 5, ALPM Heaters 1 and 2;
- Ductwork/exhaust system inspections for leaks;
- Open burning records;
- Neighbor complaint log;
- Excess Emission and Permit Deviation Reports;
- Semi-Annual Operating Reports (Minor Source);
- Semi-Annual Operating Reports (Title V);

- NESHAP Subpart EEEEEEE mercury stack testing reports and emissions calculations;
- NESHAP Subpart EEEEEEE inlet temperature monitoring records;
- NESHAP Subpart EEEEEEE Semi-Annual Reports;
- Title V Annual Compliance Certifications; and
- Refrigerant records and training certifications.

10.3 Interviews

FGMI employees and representatives from the FGMI Environmental Department were interviewed regarding the facility's air compliance program and adherence to permit and regulatory requirements. FGMI employees included Brent Culleton, Eddie Packee, Muradur Rashedin, David Stewart, Ruby Campbell, and Ding Zhang. Representatives from the ADEC were not interviewed as a part of this audit.

10.4 Field Visit

Multiple field visits were conducted during the onsite audit. These included all facilities in the process flow of the mining including the mill and operational support facilities (maintenance shops, department offices and trailers, petroleum storage and dispensing, conveyors and stockpiles); TSF; decant and seepage water infrastructure; water reservoir; Walter Creek and Barnes Creek Heap Leach systems; open pit mine; waste rock dumps; haul roads; and the Gil Project site including open pit mines, waste rock dumps, truck shop, refueling and maintenance area, and haul roads.

10.5 Conclusion

Based on the audit process consisting of document and record review, interviews to further the understanding of the specific program parameters and field visits to identify evidence of compliance or non-compliance, Fort Knox has a robust air quality program and is generally in compliance with permit and regulatory requirements. Fort Knox's Title V and Minor Source permits each have numerous recordkeeping and reporting requirements compiled into Semi-Annual Operating Reports and submitted to the ADEC. For requirements associated with voluminous records (e.g., daily differential pressure logs), Arcadis discussed the process for obtaining the required information and reviewed a sampling of the records. Table 10-1 details the observed deficiencies and recommendations for improvement.

Table 10-1. Air Quality Program Deficiencies and Recommendations.

Regulation or Key Document Reviewed	Evaluation of Compliance	Description	Situation and/or Regulation Specific to Finding/Observation	Facility
40 CFR 63 Subpart ZZZZ 40 CFR 60 Subpart IIII (RICE MACT and NSPS)	On-site interviews and record reviews	Fort Knox has several emergency and non-emergency generators which are considered stationary sources and are subject to the RICE MACT/NSPS. The requirements for each engine vary based on the engine's age, size, type of fuel(s), and emergency/non-emergency status. It is recommended that FGMI prepare a regulatory matrix that outlines the specific requirements for each engine. Any Gil engines that remain onsite (while there is a pause in operation at Gil) should be included in this matrix. The matrix can be used to track/document if the Gil engines (any that remain onsite) are properly designated as either stationary or portable.	40 CFR 63 Subpart ZZZZ 40 CFR 60 Subpart IIII	Fort Knox and Gil engines
Minor Source Permit AQ0053MSS04	On-site interviews and record reviews	Differential pressure gauge calibration records were not available for review at the time of the audit. Differential pressure monitoring is required for the induction furnace, primary and cone crusher, and reclaim tunnel. According to the facility the maintenance team checks and records the differential pressure gauge reading once a month. If there are any deviations/faults identified during that check, the gauge is repaired or replaced.	Permit AQ0053MSS04 Section 9 Condition 36 (Recordkeeping Requirements) requires records of all monitoring required by this permit including: 36.2a Calibration and maintenance records Section 3, Condition 4.3b requires monitoring differential pressure for the induction furnace, primary and cone crusher, and reclaim tunnel	Fort Knox - Induction Furnace (EU 28), Primary and Cone Crusher, and Reclaim Tunnel (EUs 30, 31, and 32)

Regulation or Key Document Reviewed	Evaluation of Compliance	Description	Situation and/or Regulation Specific to Finding/Observation	Facility
Title V Permit AQ0053TVP04	On-site interviews and record reviews	Temperature gauge calibration records were not available for review at the time of the audit. The temperature at the inlet to each activated carbon bed (EU 28A and 29A) is monitored as required by the Title V permit; however, the gauges are not calibrated.	Permit AQ0053TVP04 Section 7 Condition 32 (Recordkeeping Requirements) requires records of all monitoring required by this permit including: 32.2a Calibration and maintenance records Section 4, Federal Requirements, NESHAP Subpart EEEEEEE Monitoring Requirements Condition 5.6 requires monitoring the gas stream temperature at the inlet to the carbon adsorber for each process unit (EU 28A and 29A)	Fort Knox - Activated Carbon beds (EU 28A and 29A)
40 CFR Part 63 Subpart ZZZZ RICE MACT	On-site interviews and record reviews	Emergency and non-emergency generator maintenance records (e.g., oil change, inspections) were not available for review during the audit.	40 CFR 63 Table 2 outlines requirements for existing stationary RICE located at Area Sources of HAPs. These requirements include changing the oil and filter, inspecting the air cleaner, and inspecting hoses and belts every 1,000 hours (or 500 for hose/belt inspections) or annually, whichever comes first.	Various emergency and non-emergency generators located at Fort Knox
Minor Source Permit AQ0053MSS04	On-site interviews and record reviews	Arcadis reviewed Method 9 opacity monitoring logs for affected equipment. The form did not indicate if the unit was operating during the Method 9 reading. Based on discussions with the technicians that conduct this monitoring, staff is aware that observations should be made when the equipment is running, but there is not a procedure or training to document this practice.	Permit No. AQ0053MSS04 Section 3 Condition 4 requires visible emissions monitoring for Unit IDs 28, 29, 30, 33, 31, 32, 33, and 68 Section 5 Condition 19 requires visible emissions monitoring for Unit IDs 1 through 4, 58, 64, and 65	Fort Knox mill/associated operations

Regulation or Key Document Reviewed	Evaluation of Compliance	Description	Situation and/or Regulation Specific to Finding/Observation	Facility
		Arcadis recommends that FGMI update the opacity monitoring forms to include a check to confirm and document that the equipment was running during the inspection. The technicians performing this monitoring should be trained on this procedure and the update to the form.		
18 AAC 50.502	Records review	A technical memorandum prepared by Air Sciences, Inc. (April 13, 2021) included a Minor Source Permit Analysis that concluded that the potential emissions from Gil Mine operations (primarily oil-fired heaters and diesel-fired generators) are below the new stationary source minor permit thresholds listed under 18 AAC 50.502 (c)(1); therefore, a permit to construct and operate was not required. Although operations at Gil were paused soon after the audit, it is recommended that the potential to emit calculations be updated if operations at Gil recommence. This document can be kept on file at the facility.	18 AAC 50.502 (c)(1) "The owner or operator must obtain a minor permit under this section before: (1) beginning actual construction of a new stationary source with a potential to emit greater than (A) 15 TPY of PM-10; (B) 40 TPY of nitrogen oxides; (C) 40 TPY of sulfur dioxide; (D) 0.6 TPY of lead; (E) 100 TPY of carbon monoxide within 10 kilometers of a carbon monoxide nonattainment area; or (F) 10 TPY of direct PM-2.5 emissions…"	Gil Mine

Notes:
RICE = Reciprocating Internal Combustion Engine
MACT = Maximum Achievable Control Technology
NSPS = New Source Performance Standard
HAPS = Hazardous Air Pollutants Standard

11 Environmental Audit Conclusions

Based on the findings from audit team's review of documents and approvals, as well as observations made during the on-site inspection, FGMI is generally adhering to the environmental requirements set out in the Fort Knox Mine authorizations and permits, with specific minor exceptions, observations, and findings noted within this report. In addition, it appears that the operations and closure plans developed by FGMI and approved by ADEC and ADNR are accurate and complete, and that the financial assurance is adequate as of its approval in 2020 (with approval of amendments in 2021). Specific observations based on the items included in the Environmental Audit are detailed in the individual Conclusions subsections provided in Sections 2 through 10 of this report.

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