Community Environmental Advocates FOUNDATION
PO Box 972, Cedar Ridge, CA 95924-0972
www.cea-nc.org / email: info@cea-nc.org

Mine Waste and Asbestos Impacts Comments on the Final EIR
March 14, 2023

Overview

Airborne asbestos is hazardous to inhale, leading to lung cancer and other diseases. The Idaho-Maryland Mine Final EIR does not provide enough data to determine the potential impacts of airborne asbestos, and the asbestos management plan (ASUR plan) for preventing hazardous emissions is inadequate.

Very limited asbestos testing was done, constituting less than 2/10,000 of the total rock to be mined over the project lifespan. As the Air Quality Board stated “It would be short-sighted to commit to the ASUR Plan for the entire life of the mine based on the few samples that have been tested so far.” (FEIR Page 2-360)

The ASUR plan was developed to limit emissions, but it is a flawed document that fails to provide the needed protections. Under the plan, if the asbestos concentrations on any 1000-ton lot of mined materials would put the 3-month rolling average asbestos concentration over a threshold of 0.01%, it would not be allowed to be exported.

A key problem is accurate and timely testing. It takes 2 weeks to get the results. The Final EIR has no provisions for stockpiling materials while waiting for results. And no temporary storage on the surface is provided. To avoid the need for stockpiling mined materials, the plan states that exploratory drilling tests will determine what can be mined in advance. Then grab samples will be taken as the rock is loaded into silos for deployment. But the testing is too sparse.

The loading into silos of 1000 tons of rock requires about 166 6-ton skip loads. This means that the grab test will only capture, on average, about 1 out of 55 skip loads, and even then, the three grab samples will be mixed together to form one combined test. And even accurate sample testing before shipping will not always prevent exceeding the safe average threshold.

Examination of how this system may fail reveals that large quantities of mine waste could pass through undetected. And though the ASUR plan talks about what happens when the delayed testing shows that the threshold was exceeded, it doesn’t actually provide a credible solution or adequate oversight.

Finally, it’s important to note that all exported Mine Waste from this mine must be classified as “Restricted Materials” (ASUR 9.2, p18) Aggregate suppliers in the region have indicated that they do not handle Restricted Materials because there is no market for them and there already are abundant aggregate sources regionally.

In conclusion, the Final EIR does not provide adequate data on asbestos concentrations, and fails to adequately address processing and disposal of asbestos-bearing mine waste.

A. Introduction

Asbestos is found in all the rock types within the Idaho-Maryland Mine in varying concentrations, though it is predominantly associated with Serpentinite, which can contain high concentrations. Airborne asbestos is hazardous to inhale. It can lead to mesothelioma cancer, asbestosis, and other diseases, and is closely regulated by the California Air Resources Board (CARB). The mine's "Asbestos, Serpentinite, and Ultramafic Rock (ASUR) Management Plan" (DEIR Appendix E.2) was developed to address the management of asbestos airborne emissions. Regulation of asbestos emissions falls under the jurisdiction of CARB and the Northern Sierra Air Quality Management District (NSAQMD). Management of asbestos to prevent hazardous emissions is complicated by the difficulties of accurately testing for it and by the fact that concentrations can be found close to gold ore.

B. Criteria

The FEIR Condition of Approval 3 (COA-3) and the ASUR Plan establish a limit of 0.01% asbestos by weight as the threshold for managing all mine waste that leaves the enclosed project structures or containment structures, such as the silos, conveyors, and processing facility. Under the ASUR Plan, if the asbestos concentrations on any 1000 ton lot of mined materials would put the 3-month rolling average asbestos concentration over 0.01%, then that lot would not be allowed to be sent out of the containment structures.

The Final EIR does not provide enough baseline data to determine whether the project can be mined while meeting this threshold. Very limited testing was done. Thirty-seven samples were taken, but they came from only 3 drill holes. (Drill Holes 1-18-11, 1-19-13, and 1-19-14, ASUR Plan, Appendix C, p55-57). Assuming that each sample provided a good estimate of the asbestos concentrations for a 2000 cubic foot volume (20' h x 10' w x 10' d), the tests constituted less than 2/10,000 of the total rock to be mined over 75 years. The criteria for sample selection was not specified and the sampling party was not named.

Even so, of the 37 drill core samples from the mine that were tested, asbestos testing (TEM method) determined that 15 had asbestos, and 8 of those had asbestos over the 0.01 limit. A potential hazard clearly exists.

There are three test methods. Polarized Light Microscopy (PLM) is fast but not precise, being only valid for detecting above 0.25%. This method is not adequate for detecting the 0.01% threshold, but it is used to define the threshold for surfacing applications under the Airborne Toxic Control Measure (ASTM). The Transmission Electron Microscopy (TEM) process is more accurate, but takes up to 2 weeks to get a result. The TEM test is what dictates most of the management activities in the ASUR Plan to prevent asbestos emissions. (A third method, Phase Contrast Microscopy (PCM), is not valid for rock sampling but is used for air quality monitoring and provides a referential standard for TEM.) (ASUR, p8).

The FEIR has NO plans for the temporary stockpiling of mined materials. So, to avoid the need for stockpiling mined materials, the ASUR Plan states that samples from exploratory drilling will be tested for asbestos in advance of mining. If the anticipated rolling average asbestos levels exceed 0.01%, gold ore will not be mined and barren rock will either not be mined or mined using a dust collection system and materials will be disposed underground (ASUR, p9). However, the prescribed testing is sparse and could easily miss rock having higher asbestos levels. Just one combined test per 1000 thousand tons of mine rock is prescribed (1000 tons is approximately equal to an 8'x8'x170' block).

The mined rock will be lifted from the mine to the silos on the surface with skips. Gold ore will be dumped into a silo with 1000 tons of capacity and barren rock into two smaller silos with 400 tons of capacity. From the gold ore silo, material is fed into the processing facility via an enclosed conveyor.

The project plans to process about 1500 tons of rock per day, from which 1000 tons is expected to be mineralized rock (gold ore) and 500 tons is expected to be waste rock (barren rock). The gold ore will be run through the processing facility to extract a gold concentrate, leaving 1000 tons of fine sand tailings material which must be disposed.

About half of the sand tailings, 500 tons per day, will be mixed with cement to form a cement paste backfill material which will be put back into the mine. The other 500 tons per day of sand tailings will stockpiled to be loaded onto trucks with a front-end loader and trucked off. The 500 tons of barren rock that are mined daily will be moved via conveyors to the truck loading building for export.

C. Deficiencies of the Testing and Processing Plans

To prevent the 3-month rolling average of asbestos in rock from exceeding the 0.01% threshold, the ASUR Plan relies on developing an inventory of asbestos levels of un-mined rock through exploration and testing, and then avoiding mining the rock that would violate the threshold.

However, the critical test that monitors what will be exported is taken when the gold ore and barren rock are lifted and dumped into the silos. A minimum of three grab samples must be taken for each 1000 tons that are transferred. These three samples will then be combined to form a composite sample for a single test result. Each sample is added to the record which tracks the rolling average of exported materials.

The materials are lifted into the silos using skip carts that lift around 6 tons (ASUR, Fig 2). The processing of 1000 tons requires about 166 skip loads. Each grab test will only capture, on average, about 1 out of 55 skip loads, and even then, the three grab samples will be mixed together in a combined test. Because of the sparseness of the sampling, 1000 tons of mine rock, or about 50 truckloads worth, could contain excessive levels of asbestos and still pass through undetected.

Complicating that, the materials go into a split output stream, with a daily average of 1000 tons going to the processing facility and 500 tons going directly off-site as barren waste rock. It is not specified how the grab samples would be associated with the two output streams.

After processing, as described previously, the sand tailings are exported: 500 tons of the tailings will go off-site, and 500 tons will be transported back into the mine and used as cemented paste backfill. The plan should specify separate sampling criteria for each stream of materials which should follow those materials through the process phases.

The amount of required testing is inadequate to reasonably detect the asbestos levels of materials leaving the containment structures. The ASUR Plan does not even specify testing of the sand tailings after processing, and there are no provisions for the gold ore to be tracked to associate the specific test results with the 1000 ton loads as the material is sent through the processing facility. If a TEM grab test comes back with unexpectedly high asbestos values, how would the processing system determine which sand tailings from the processing output should be redirected to be used as cemented-paste backfill? This part of the plan is inadequate in assuring that higher-than-expected levels of asbestos are not being exported.

The materials' processing is a stream, but the ASUR Plan tries to manage the materials by testing blocks of un-mined rock. Materials from multiple sites within the mine will be transported, crushed to 6" maximum size and lifted for processing. Most of the materials will then be sent via conveyors to the processing facility, and the resultant sand tailings will be conveyed and accumulated for hauling out. The testing procedure is poorly suited for tracking the materials through the processing system. How will the process keep track of which final outputs were from a given block of un-mined rock?

In addition, under certain conditions as described in ASUR Plan Section 6.0-7i (ASUR, p8), gold ore with high asbestos levels would be processed, which means introducing gold processing tailings with known exceedances into the same system.

D. Deficiencies in the Moving Average Approach

Exceeding the 0.01% threshold would only be detected in hind-sight once the TEM tests are processed. In addition, a series of many individual loads in excess of 0.01% could be shipped out and still not exceed the 3-month rolling average if the average started out low. Given that there is no plan for on-site storage, the possibility is real that, during the 2 week testing lag time, many additional 1000-ton batches of materials exceeding 0.01% asbestos would be processed. Taken together, many weeks' worth of mine waste with high levels of asbestos could be shipped out.

We noted above that one test from 3 grab samples is sparse and can likely give inaccurate results. But even if testing accurately measures the asbestos levels per day, it does not assure that the 3-month rolling average won't end up exceeding the 0.01% threshold. For example, the following test results would result in a 0.024% average asbestos concentration on Day 120 even after an operations shut down on day 106.

Threshold Exceedance Example

Day 105:
- 75 days exported averaging 0.008%
- 15 days exported averaging 0.02% ((75x0.008)+(15x0.02)) /90 = **0.01% average. OK**
- 15 days exported (test results not back yet, avg 0.03%)

Day 106:
- 74 days exported averaging 0.008%
- 15 days exported averaging 0.02%
- 1 day exported at 0.03% (74x0.008)+(15x0.02) + (0.03) /90 = **0.0102% average, SHUT DOWN**
- 14 days already exported (test results not back yet, avg 0.03%)

:

Day 120:
- 60 days exported averaging 0.008%
- 15 days exported averaging 0.02%
- 15 days exported averaging 0.03% ((60x0.008)+(15x0.02)+(15x0.03))/90 = **0.024%**

Results in 15 days exceeding the 0.01% rolling average!

In the Threshold Exceedance Example, the 90 day average asbestos level ends up at 0.024% even while complying with the ASUR Plan by shutting down on the first day of exceedance (Day 106). Plus, in total, 30 individual days of output exceeded 0.01% asbestos concentration.

The ASUR plan to prevent the asbestos levels from exceeding the 0.01% threshold is inadequate.

E. Surface Exposures of Airborne Asbestos at the Engineered Fill Sites

There will be about 500 tons per day of sand tailings exported from the ore processing plant. This represents approximately one half of 1000 tons of tested gold ore from the silo. The sand tailings from the gold ore processing is stockpiled inside a containment structure to be loaded onto trucks with a skip loader and shipped off. Operations run for 24/7 but materials are only shipped off 16 hours per day and may have weather related days of no shipping, accumulating the sand tailings, which are loaded into trucks outside the structure (FEIR Page 2-543). Conceivably, the 30 days of gold ore that were processed in the Threshold Exceedance Example could produce sand tailings exceeding the 0.01% threshold.

How would it be determined which sand tailings came from the contaminated materials that end up in the sand tailings containment structure?

After the sand tailings are delivered to the planned Engineered Fill dumping sites at the Centennial site, and later the Brunswick site, they will be mixed with the barren rock in the open air by "on-site blending of blast rock and sand tailings" (DEIR Centennial GeoTechnical Report, p13). Using the Threshold Exceedance Example, thirty days of materials exceeding the asbestos threshold - equivalent to 1500 truck loads - could be mixed in the open air on the Engineered Fill sites, in clear violation of the ASUR Plan goals for reduction of airborne asbestos.

F. Exported Mine Waste is Classified as "Restricted Materials"

All mine waste, aka "Engineered Fill" or "sand tailings and barren rock," from the Idaho-Maryland Mine is considered "Restricted Materials" under 17 CCR 93106(d)(1). (ASUR Plan, p16-17).

The Restricted Materials can be separated into two groups, one group being below the 0.25% threshold under the ASTM rule, and the other group being equal or above that threshold.
For materials below 0.25% asbestos using the PLM test, the material can be transported and used for Engineered Fill or surface applications, but "*Any person who transports Engineered Fill (considered a restricted material) must maintain a copy of all receipts with the material at all times during transit and application*" (ASUR p16).
The following receipts must be provided:

A. The amount of restricted material that was sold or supplied;
B. The date that the restricted material was sold or supplied;
C. The dates that the restricted material was sampled and tested; and
D. A statement that the asbestos content of the restricted material is less than 0.25 percent.

Because the ASUR plan establishes a threshold of 0.01% for the rolling 3-month average using TEM testing, it is probable that most of the mine waste that is output from the facility would fall below 0.25%. However, it is worth noting that some 1000 ton daily outputs could exceed 0.25% and still not cause the rolling 3 month average to exceed 0.01%. (For example, 89 days with an average of 0.007% and 1 day with 0.25% asbestos concentration by weight equals a rolling average of less than 0.01%.)

For materials at or above 0.25% asbestos, the mine waste is classified as "Asbestos Containing Material" under ATCM for Surfacing Standards. For Engineered Fill materials detected at or above 0.25% using the PLM test, strict usage requirements are imposed to prevent exposure or possible future

disturbances. ATCM requires that "*the material shall not be used for surfacing applications pursuant to 17 CCR 93106*" (ASUR p16).

In the case of at or above 0.25%, it cannot be used for surfacing, but it may be used for operations that assure the materials will be handled under strict conditions. All materials in this classification must be accompanied with the following written receipt:

> **WARNING!**
> **This material may contain asbestos.**
> *It is unlawful to use this material for surfacing or any application in which it would remain exposed and subject to possible disturbances.*
> *Extreme care should be taken when handling this material to minimize the generation of dust.*
>
> *Any person who transports Engineered Fill (considered a restricted material) must maintain a copy of all receipts with the material at all times during transit and application.*

Of course, the three-month rolling average must also be less than 0.01% to even be shipped out.

G. The "Restricted Materials" classification may severely limit off-site sales.

As the ATCM rules make it clear:
"**All aggregate extracted from the Idaho-Maryland** *underground mine, including barren rock and mineralized material sent for processing,* **is considered Restricted Material** *under the ATCM for Surfacing Applications*" (ASUR 9.2, p18).

Aggregate suppliers in the region have indicated that they do not handle Restricted Materials because there is no market for them.

H. Unapproved Underground Dumping May Violate Water Board Standards

The ASUR Plan does not address how the mine waste which might be diverted to underground storage because of high asbestos levels would be tested to conform with the Water Board's requirements to prevent pollution of ground and surface waters through leaching of hazardous chemicals. Because the Final EIR did not include adequate testing of the mine rock for possible water contamination, the Water Board is requiring continuous testing to determine whether the materials conform to Group C mine waste, which is required for off-site use, or whether the Water Board will require special processing as the more hazardous Group A or Group B mine waste.

I. The ASUR Plan is Ambiguous and Self Contradictory

1) Ambiguous Terms

The ASUR Plan discusses the processing and testing of mine waste by utilizing the euphemism "Engineered Fill," eventually describing it on page 13 in the statement: "...asbestos content of Engineered Fill (barren rock and sand tailings) placed and compacted..." Since there is an intent to simply sell the the mine waste, "Engineered Fill" doesn't seem to mean the applicant is including the "placement and compacting." Hence, the document seems to define Engineered Fill simply as "barren rock and sand tailings."

The use of the term “engineered fill” is ambiguous when there are statements such as ““the remainder of the *sand tailings* will be used for *engineered fill*.” Substituting the words “barren rock and sand tailings” for “engineered fill” in this statement then reads thus: “the remainder of the *sand tailings* will be used for *barren rock and sand tailings*.”

Another confusing example is the use of the term “Asbestos Containing Materials.” This term is explicitly defined in the document to mean materials having over 0.25% asbestos under the ASTM rule. However, materials having asbestos exceeding 0.01% are also referred to as “asbestos containing materials,” as seen on ASUR Plan page 20.

The ASUR Plan document contains numerous ambiguous statements which distort the meaning and validity of the document.

2) Aggregates, Surfacing and Loopholes

Rock aggregates that are used in the construction industry include a wide range of materials mostly consisting of specific crushed rock sizes that are generally screened or filtered to within certain size limits (e.g. ¾” Class II road base) and many also require washing. The barren rock that is produced by the mine will be mixed crushed rock 6 inches or less in size and would need to be recrushed to the right sizes, screened, and sometimes washed to meet most aggregate market demand. The sand tailings are fine sand or silt size granules which have very limited use. (See https://www.gohbe.com/index.php/rock-masonry.) However, the ASUR Plan mistakenly treats Engineered Fill and surfacing materials interchangeably. Engineered Fill made of barren rock and sand tailings is not suitable for surfacing applications. Sand tailings have little use and the barren rock would first need additional processing, which requires facilities that the mine does not provide.

The word “aggregate” is commonly known but is not specifically defined in the ASUR Plan. In Section 8.4 (p16), the term is used to describe regulatory restrictions: “*If a composite sample determines that aggregate is not Asbestos-Containing Material, a written receipt must be provided to the recipient of the Engineered Fill.*” This statement is ambiguous in that it is not clear that the Engineered Fill being referred to is the “aggregate” used in this sentence, or some additional materials.

The ASUR Plan repeatedly refers to surfacing materials as if they are equivalent to Engineered Fill. For example, the statement in Section 6.0 -Item 7(i):
“*If planned mining is projected to result in insufficient material available for Surfacing in Engineered Fill Placement Plan:*
i. An operational plan will be prepared and approved….”

Item 7(i) in section 6.0 also describes ambiguous conditions about “insufficient materials” which seemingly allow mining of Asbestos Containing Material if it is gold ore.
Then the subsequent Item 8(i) in Section 6.0 then states that if the 0.01% threshold would be exceeded, gold ore will not be mined. *(ASUR, p9)* This is in direct contradiction to Item 7(i)!

3) Operations Oversight

The ASUR Plan lacks clearly defined oversight for the management of the asbestos materials. Nor are guidelines for approval of changes to operations or procedures provided. Here the responsibility is given to an unspecified “geology department.”

“*If the three-month rolling Asbestos Inventory for materials hoisted to surface exceeds 0.01% asbestos by mass of PCM equivalent units the geology department will immediately investigate the source of the*

asbestos containing material and halt mining in the area of concern until a revised mine plan is prepared in compliance with the ASUR Plan" (ASUR, p20).

This is inadequate. To provide reasonable safeguards, an independent party should be responsible for overseeing monitoring, investigations, reporting, and corrective actions. What constitutes a valid report should be defined. And guidelines for subsequent actions should be explicitly defined and authorized by the County and NSAQMD, and not be done by employees of the mine.

The ASUR Plan was written by Rise Gold (ASUR, p1).

Conclusion

The Final EIR does not provide adequate data on asbestos concentrations in mine rock to determine the potential impacts under CEQA. In addition, the ASUR Plan fails to adequately address processing and disposal of asbestos-bearing mine waste to meet its stated goals, and the ASUR Plan is internally inconsistent and ambiguous, providing numerous loopholes in regulatory oversight.

The potential for hazardous airborne pollution from the mine project is a significant health concern which is inadequately addressed in the Idaho-Maryland Mine Final EIR. This Final EIR should be rejected.

The appended figure is from page 106 of Rise Gold's "Technical Report On The Idaho-Maryland Project" (https://www.risegoldcorp.com/uploads/content/I-M_Tech_Report.pdf). It shows the Morehouse Fault and the location of gold ore in close proximity to surrounding Serpentinite rock beds. Serpentinite is generally high in asbestos. The purple shows Serpentinite, the orange shows Gabbro, and the red line shows the gold-quartz ore vein. The region near the bottom of the figure is a primary target for the proposed project.

Geology Cross Section from Rise Gold Technical Report