COLORADO
Division of Reclamation, Mining and Safety
Department of Natural Resources

October 22, 2021

Jim Harrington
Colorado Legacy Land, LLC
12150 E. Briarwood Ave., Suite 135
Centennial, CO 80112

RE: Schwartzwalder Mine, Permit No. M-1977-300, 112d-2 Designated Mining Reclamation Permit Amendment Application (AM-6), Preliminary Adequacy Review

Mr. Harrington:

The Division of Reclamation, Mining and Safety (Division) has completed its preliminary adequacy review of your Amendment Application (AM-6) submitted for the Schwartzwalder Mine. All comment and review periods for the application began on July, 29, 2021, when the application was called complete for filing purposes. The decision date for the application is set for December 26, 2021.

The review consisted of comparing the application content with specific requirements of the Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal, and Designated Mining Operations. The Division has identified adequacy items in the application requiring clarification or additional information. These items are identified below under their respective exhibit heading, and are numbered sequentially.

Exhibit E – Reclamation Plan (Rule 6.4.5):

1) Please provide a detailed reclamation plan for all affected lands at the site, which correlates with the reclamation plan map provided in Exhibit F and the bond estimate provided in Exhibit L. Please be sure this plan addresses all surface disturbances and mine openings, mine pool management, and water monitoring. This plan must comply with all applicable requirements of Rule 3.1 - Reclamation Performance Standards and Rule 6.4.5 – Reclamation Plan.

2) Please provide a cross-section of the site showing the mine workings, mine pool level (at 150 feet below Steve Level), adjacent monitoring wells with screened intervals and measured water levels, Ralston Creek channel, and any significant fracture/fault systems and other potential groundwater migration pathways that intersect the mine workings.

3) Please provide a plan view map of the site showing the extents of the mine workings, adjacent monitoring well locations (shown in the cross-section requested above), Ralston Creek channel, any significant fracture/fault systems and other potential groundwater migration pathways that intersect the mine workings, and the point at which any such pathways intersect the creek system between the mine site and Ralston Reservoir.

4) On page 13, the operator states "Upon completion of the alluvial valley excavation project, this bypass pipeline shall be removed, and Ralston Creek will flow through its natural channel". If this is part of the proposed reclamation plan, additional details are needed. Please provide approximate dimensions for the pipeline to be removed, and any other associated structures/features which will require demolition and/or removal (e.g., bollards, upgradient cutoff wall, berms). Additionally, please describe any proposed changes to the creek channel for final reclamation. After the excavation project is completed, how will the valley floor be reconfigured to establish positive drainage to the creek? Lastly, with the removal of alluvial groundwater monitoring wells and sumps in the valley during the excavation project, how will the operator continue to monitor potential impacts to the creek and alluvial groundwater system once creek flows have been re-established across the mine site?

5) On page 14, the operator states " Maintaining the mine pool below the regulatory limit (150 feet below Steve Level) has led to (i) establishing a hydraulic gradient away from Ralston Creek in the permit area, and (ii) reducing the exposure of wall rock to oxygen, which minimizes uranium oxidation in the workings and translates to less mobile uranium to treat". The Division has the following comments regarding this statement:

   a. The "regulatory limit" for the mine pool was set by the modified Board Order, dated October 4, 2012, which required the operator to "reinitiate mine dewatering and water discharge treatment sufficient to bring the mine water table to a level at least 150 feet below the Steve Level, and sufficient to reestablish a hydraulic gradient away from Ralston Creek". While the regulatory level was initially set at 500 feet below Steve Level in the Board Order dated August 11, 2010, it was modified as a result of information provided in AM-4 (approved on April 29, 2013), which indicated dewatering to the level of 150 feet below Steve Level would re-establish a hydraulic gradient away from the creek in the permit area, and reduce the exposure of wall rock to oxygen in order to minimize uranium oxidation in the workings. At the time, the mine workings were flooded to the creek level, so the efficacy of the proposed dewatering level had not yet been validated. Now that the mine pool has been maintained below the 150 foot limit for some years, the efficacy of this limit can be evaluated based on data collected over this period. Please provide additional information demonstrating that maintaining the mine pool below 150 feet below Steve Level establishes a hydraulic gradient away from the creek. In accordance with Rule 3.1.6(1), this demonstration must address potential interaction between the mine pool and the creek not only within the permit area, but also downgradient of the permit area (between the mine site and Ralston Reservoir).

   b. One of the arguments made by Cotter Corporation, the former operator, against the initial 500 foot dewatering limit, was that pumping the mine pool down to such a deep level would expose a lot of wall rock to oxidation, thus increasing uranium concentrations in the mine pool. The modified 150 foot dewatering limit was meant to reduce the exposure of wall rock to oxidation. However, in recent years, the water treatment plant operation strategy has consisted of pumping the mine pool down much deeper than the 150 foot limit (to approximately 400 feet below Steve Level) to support seasonal operation of the plant. This strategy results in the repeated exposure and flooding of hundreds of vertical feet of mine workings. Please explain how this operating strategy is "reducing the exposure of wall rock to oxygen, which minimizes uranium oxidation

in the workings" as stated. Would maintaining the mine pool at a consistent level year-round result in a more chemically stable environment?

6) On page 15, the operator states "The WTP has been operating approximately 50% of the time for the last three consecutive years". However, according to Table E-3, the plant has operated for 50% or less of the time only in 2018 and 2020. In 2019, the plant operated for 66% of the year. Therefore, the data provided does not demonstrate the plant has been operating 50% of the time for the last three consecutive years. Does the operator have additional data which supports this statement?

7) On page 15, the operator mentions a malfunction with the 60-hp pump that occurred in April 2020, during which time, the 25-hp pump was brought into operation to dewater the mine pool. Please explain the cause of the malfunction, and what was done to correct this issue. Has the operator modified the mine pool dewatering program and/or infrastructure to help prevent this issue from occurring again? Does the operator intend to maintain the 25-hp pump in the Steve Adit as a back-up?

8) The current mine pool dewatering program includes shutting down the water treatment plant and pump for a portion of the year. In an emergency situation, what is the shortest amount of time it would take to safely bring the plant/pump back online to re-initiate mine dewatering?

9) On page 15, the operator discusses entering the mine in October 2020 to verify the mine pool elevation and to calibrate the transducer used to measure the mine pool elevation. During this time, it was discovered the mine pool had been dewatered to 22 feet lower than the elevation of the transducer, which caused inaccurate measurements to be recorded. The transducer was then lowered to 354 feet below the Steve Level and recalibrated. When was the last time (prior to 2020) the mine pool elevation was verified and the transducer calibrated? Is this something that must be done on a regular basis? When was the current transducer installed in the mine? Given the importance of keeping the mine pool lowered below a specific elevation, has the operator considered installing an additional transducer or implementing other redundancies to ensure accurate measurements of the mine pool level are being recorded?

10) Please describe the cone of depression created when pumping down the mine pool with the 60-hp pump. Where is the transducer installed relative to the pump intake? Is there a chance the outer edges of the mine pool (outside of the pump capture zone) could be at levels higher than the regulatory limit even when the transducer readings indicate the mine pool is below this limit?

11) On page 15, the operator states "On the basis of historical refill trends, once the mine pool is dewatered at the end of the operating season, the natural groundwater recharge will take approximately six months before the mine pool approaches the regulatory limit". In discussing "historical refill trends", is the operator referring to the data presented on Figure E-1, which shows mine pool levels from January 2018 to April 2021? At what point after the 2012 Board Order, was the mine pool pumped down at least 150 feet below Steve Level? Did this occur prior to the September 2013 flooding? Does the operator have sufficient data to predict how the mine pool might be affected by a significant precipitation event such as what occurred in September 2013?

12) On page 16, the operator discusses how chemical stabilization of the mine pool has been accomplished through in-situ treatments, which are designed to create a sulfate-reducing environment for the reduction

of soluble uranium species to insoluble uranium species. The reducing environment is essential for the reduction of U(VI) to U(IV) to immobilize uranium and the precipitation of iron sulfides. In addition to the formation of insoluble uranium species, trace metals may coprecipitate with or adsorb on the surfaces of the iron sulfides. Please describe what happens to the precipitates that occur due to the in-situ treatments. Is it expected that these precipitates sink downward in the mine pool? Could the repeated raising and lowering of the mine pool hundreds of feet cause the precipitates (e.g., adsorbed to wall rock) to re-dissolve into the mine pool? Could the RO reject brine injected into the mine pool have any effect on the results of the in-situ treatments?

13) The Division has the following comments regarding Table E-1 – Observed Groundwater Gradients;

    a. Please explain why there is no mine pool elevation data available for Q1 and Q2 of 2019.

    b. Figure E-1 includes mine pool levels going back to January 2018. Why was this data not included on Table E-1 to compare with water levels from wells MW-15 and MW-18?

14) On page 19, the operator states "The in-situ treatment was interrupted by a 1,000-year rainfall event in September 2013 that prohibited access to the Schwartzwalder mine from September 2013 until the summer of 2015". Were mine pool levels monitored during this time? Since water quality data for the mine pool is presented for this period on Figures E-3 and E-4, it would appear the site could be accessed for water quality sampling during this time. This would imply that access to the mine was not "prohibited", and that some limited access may have been available. Please explain and/or correct this discrepancy. Additionally, please describe how the operator would handle an extended access-limiting/prohibiting event in the future. If Glencoe Valley Road was not available, could the site be accessed any other way? Can mine pool levels be monitored remotely?

15) On page 20, the operator states "there was not a significant decrease in uranium concentrations after the 2020 in-situ treatment as was seen in the previous in-situ treatments". The operator then lists some factors that may have contributed to these results. Does the operator expect there will be a point at which continued in-situ treatments is expected to have little to no effect on uranium concentrations in the mine pool, or possibly create other undesired effects (e.g., increased concentrations of other constituents of concern)? During the Division's last inspection of the site on September 14, 2021, the operator mentioned plans to perform an additional in-situ treatment the first week of October. Was this treatment conducted? If so, does the operator expect to observe similar results after this treatment as was observed after the last one?

16) On page 20, the operator discusses "suspect" data for mine pool uranium and molybdenum concentrations (shown on Figures E-3 and E-4) in the months preceding the 2017 in-situ treatment. The operator states "these data are suspect because in the nearly 10 years of data shown on these figures, uranium concentrations have not exceeded 25 mg/L and molybdenum concentrations have not exceeded 2 mg/L, with the possible exception of one sampling event in November 2017" and that "it is thought that there might have been either a mix-up in the labeling of the samples (or) the samples were collected from the wrong sample port". The operator then concludes "Regardless, the suspect data do not alter the conclusion that the mine pool has been chemically stable for the last three years". The Division has the following comments on these statements:

a. Nearly 10 years of data are not shown on Figures E-3 and E-4. While the earliest data shown is from mid-2012 (molybdenum) and late 2012/early 2013 (uranium), there is a small data gap between late 2014 and mid-2015, a larger approximately 2 year data gap between late 2015 and late 2017, and an approximate 6-7 month data gap between late 2019 and mid-2020. The Division estimates the data presented on these two Figures represents less than 6 years of data total. Does the operator have an explanation for the data gaps shown?

b. The "suspect" data appears to include 9-10 sampling events. It seems unlikely a labeling or sampling error would have been repeated that many times. It may be more likely, especially given the elevated concentrations observed around the same period but not included in the "suspect" data, the data in question actually represents mine pool conditions during that time. If this is the case, does the operator have an explanation for the significant uranium and molybdenum concentrations observed in the mine pool in 2017?

c. The operator believes the "suspect" data may be attributed to sampling or labeling errors. Please describe how the sampling procedure has been improved to prevent any such errors from reoccurring.

d. Please provide additional explanation of how the data presented in Figures E-3 and E-4 demonstrate the mine pool is chemically stable, given the data gaps on these figures, the "suspect" data for 2017, and the overall higher uranium concentrations observed in the post-2015 data compared with the 2013-2015 data.

17) On page 21, the operator refers to Figure E-5 which shows concentrations and linear regressions for uranium and molybdenum over three consecutive years. Please explain how the linear regression method was chosen for this analysis. Would another method be more appropriate for the type of data being analyzed? Additionally, there appears to be an approximate 6-7 month data gap between late 2019 and mid-2020. Therefore, the analysis represented on Figure E-5 does not cover a full 3 year period. Please include data collected since September 2020 in this analysis.

18) On page 21, the operator refers to Table E-2 which compares the pre-2017 sample data mean (calculated from mine pool data collected June 2000 to July 2007) to post-2017 sample data (calculated from mine pool data collected March 2018 to September 2020). The data presented in Table E-2 is meant to provide further demonstration that chemical stabilization of the mine pool has been achieved for the last three consecutive years. The Division has the following comments on Table E-2:

a. The post-2017 data presented in this table only covers a period of 31 months, not quite a full three year period. Has the operator considered including data collected over the past year (since September 2020) in this analysis? Would adding this data change the results?

b. Without further demonstration, the Division does not accept that the 2017 data (considered to be "suspect") is unrepresentative of the actual mine pool chemistry. Therefore, it may be appropriate to include this data in the analyses presented in Table E-2 as well as Figure E-5.

c. Given the fairly wide range in post-2017 concentrations for some of the constituents of concern (e.g., total uranium minimum = 2.87 mg/L and maximum = 23 mg/L), is comparing the mean values of this dataset to the mean values of the pre-2017 dataset (which may also have a large range) the best method for comparing these two datasets?

d. There appears to be several errors in the post-2017 data presented, in which, the mean value is lower than or equal to the minimum value, including for: bicarbonate as CaCO3, calcium, conductivity, pH, potassium, sodium, temperature, dissolved aluminum, dissolved magnesium, dissolved zinc, total antimony, total copper, total zinc, and dissolved radium 226. Please correct these errors and update the analysis accordingly.

e. Please provide further discussion on the increases observed in post-2017 data for chloride, iron, and arsenic. Does the operator have any idea what might be causing these increases? Could the in-situ treatments and/or the injection of RO reject brine into the mine pool have any effect on these constituents?

19) Please provide a graph which plots all available data collected since 2012/2013 for uranium, molybdenum, chloride, iron, and arsenic concentrations in the mine pool. Please include available mine pool elevation data, dates for in-situ treatments, and the date the operation began injecting RO reject brine into the mine pool. Please provide a discussion of the relationship and any trends observed between these plots.

20) On page 24, the operator provides a section titled "Physical and Chemical Stabilization Conclusion". The Division has several comments in this letter requesting additional information and/or evaluation regarding the mine pool water quality data presented, in-situ treatments, sampling procedures, water treatment plant/dewatering operations, and potential groundwater migration pathways at the site. Based on the information provided, this section may need to be updated.

21) On page 25, the operator provides a brief summary of the conclusions made based on the tracer test results. The Division has several comments in this letter requesting additional information regarding the tracer study. Based on the information provided, this section may need to be updated.

22) On pages 25-26, the operator discusses the proposed water treatment plant operating strategy. Current plans include operating the plant seasonally for approximately 6 months to manage the mine pool, and possibly less than 6 months if supported by additional data. During operations, the 60-hp pump will be used to dewater the mine to approximately 400 feet below Steve Level. During the period the plant is shut down, in-situ treatment of the mine pool will be conducted as needed to maintain chemical stabilization. The criteria for in-situ treatment of the mine pool will be when the annual concentration of dissolved uranium indicates an increasing trend as compared to the prior year. The Division has the following comments regarding this section:

a. What is the target mine pool level (in feet below Steve Level) at which, the water treatment plant and pump are brought back online?

b. On average, how long does it take to bring the water treatment plant and pump back online?

c. Please provide more details on how the mine pool levels are monitored throughout the year, and what kind of alert system(s) are in place.

d. Is the 25-hp pump still maintained in the Steve Adit as a potential back-up in the event the 60-hp pump is not functional?

e. How will an "increasing trend" in dissolved uranium concentrations in the mine pool be determined for in-situ treatments?

23) The Division has the following comments regarding Figure E-1:

a. Please update this graph to include data collected since March or April of 2021.

b. Please adjust the mine pool elevations prior to October 8, 2020 to conform with the transducer recalibration.

c. Please indicate times the water treatment plant was online and offline.

d. Please include the dates that in-situ treatments were performed.

24) The Division has the following comments regarding Figure E-2:

a. This figure depicts the backfill slurry (RO reject brine) as filling the bottom of Shafts #1 and #2 and partially filling drifts connected to these shafts. Does the operator have any idea how the backfill slurry is actually deposited in the mine workings? Is there a chance the slurry could be filling or partially filling upper workings rather than sinking to deeper portions of the mine? If so, how would this impact the water pumping and treating operations? Could this scenario result in an isolated mine pool which can no longer be properly sampled or treated? Could this scenario result in contaminated groundwater being redirected toward Ralston Creek?

b. Please describe all water treatment and management infrastructure installed inside the Schwartzwalder Mine. Will all existing infrastructure remain for final reclamation? How frequently must this infrastructure be inspected and repaired/replaced?

c. Please provide additional details on the process for injecting the RO reject brine into the mine, including whether the brine is immediately injected into the mine after the treatment process, or temporarily stored at the surface. If the brine is temporarily stored at the surface, please specify where it is stored, the approximate maximum volume that is stored at the surface at any given time, and the average length of time it is stored at the surface prior to being injected into the mine.

d. Does the operator have an emergency plan for disposing of the RO reject brine in the event the infrastructure used to transport this waste to the mine workings is not functional, but pumping must continue?

25) The Division has the following comments regarding Figure E-3:

    a. Please explain the increased variation between total and dissolved uranium concentrations observed in data collected from 2017 to 2020 compared with the closer values observed in the data from 2013 to 2015.

    b. Please explain how the "suspect" data was chosen. Was this selection based on the data points plotting above 25 mg/L? If so, how does the operator explain the data points within the same timeframe (not included in the "suspect" data) which also show elevated concentrations (compared to the rest of the post-2012 data provided)?

    c. Please include data collected since September 2020.

    d. Please include mine pool levels.

26) The Division has the following comments regarding Figure E-4:

    a. Please explain why this figure includes two data points for molybdenum concentrations prior to November 2012, whereas this data is not available for uranium concentrations.

    b. Please explain how the "suspect" data was chosen. Was this selection based on the data points plotting above 3.0 mg/L? If so, how does the operator explain the data points within the same timeframe (not included in the "suspect" data) which also show elevated concentrations (compared to the rest of the data provided)?

    c. Please include data collected since September 2020.

    d. Please include mine pool levels.

27) The Division has the following comments regarding Figure E-5:

    a. Please explain why the linear regression method was chosen for this analysis. Would another method, perhaps the Mann-Kendall test, be more appropriate for the type of data being analyzed?

    b. Please include additional tick marks on the vertical and horizontal axes to make it easier to determine the concentration and sample date for the data points.

    c. Please expand this analysis to include data collected since September 2020.

28) The Division has the following comments regarding Appendix 1 – Conceptual Site Model:

    a. This Conceptual Site Model (CSM) is dated November 2018. Please provide an updated CSM that incorporates the data collected since that time, and reflects current conditions and site knowledge.

b. Because no page/slide numbers are provided in the CSM, the Division will refer to the slide title for its comments. However, the operator is encouraged to add page/slide numbers to the CSM for future reference (and revision).

c. On the slide titled "A Brief History", the operator might consider updating the timeline to include significant events that have occurred at the site since mining ceased (e.g., mine pool pumped down 150 feet below Steve Level, new RO water treatment plant brought online, new 60-hp pump installed).

d. On the slide titled "Key Reclamation Issues", in the list of Current Issues, the operator includes "hydraulic connection(s) between the mine workings and Ralston Creek". Please explain what studies have been done to investigate this issue. Additionally, please explain what is meant by the Future Issues "Non-tributary water potential" and "Potential for using mine pool for long-term storage".

e. On the slide titled "Infiltration", the data presented is from 1978-2005. Please update this slide to incorporate more recent data.

f. On the slide titled "Surface Runoff", the operator states Ralston Creek flows vary from 2.1 cfs (baseflow) to 32.4 cfs (May) just upstream of Ralston Reservoir". Please revise this information to reflect recent data, if needed. This slide also states "Some uncertainty as to whether RC is gaining or losing in the mine area". Please clarify whether this information is still unknown. Has the operator collected any additional data since 2018 that might shed some light on this matter? If so, please update this slide accordingly.

g. On the slide titled "Water Treatment Plant", please update this slide to reflect current conditions with only one sump in operation. Additionally, please describe how the brine is "amended" prior to being injected into the deep mine workings.

h. On the slide titled "Reverse Osmosis and Brine Injection", please provide an estimated volume of brine generated from the WTP on an annual basis. Additionally, this slide refers to "density stratification" in the mine pool, while in Appendix 2 – Tracer Test, the operator describes the mine pool as being "sufficiently mixed". Please explain this contradictory language. When referring to the mine pool as mixed, is the operator referring to only the upper portion of the mine pool?

i. Slide titled "Clean Water Management" includes "Conditioning and/or polishing before discharge". Please describe the type(s) of conditioning and/or polishing that is done prior to discharge. Additionally, please explain what type(s) of "beneficial use" for the WTP discharge are being contemplated.

j. Please update the first slide titled "Water Capture and Diversion" to reflect that only one sump remains on site. Does the operator have any plans to install additional sumps in the valley once the excavation project concludes and clean fill has been placed, in order to monitor any potential

impacts to the alluvial groundwater system from site facilities (e.g., waste rock piles, mine pool, water treatment plant)?

k. Please update the third slide titled "Water Capture and Diversion" to reflect that only one sump remains on site.

l. Please update the slide titled "Alluvial Groundwater Flow" to reflect that alluvial water is currently only being intercepted by one sump. Please describe how the operation is managing stormwater/runoff that comes into contact with any exposed contaminated alluvial soils temporarily stockpiled on site during the valley excavation project. Is any water retained in the valley for more than 72 hours pumped to the water treatment plant for treatment prior to discharge?

m. The first slide titled "Bedrock Groundwater Flow" includes "...potential connections to RC via joints/fractures" and "Illinois Fault System". Has the operator performed any studies to better characterize the hydrogeology in the area, particularly with regard to bedrock groundwater flow through joints/fractures, pegmatites, and/or major fault systems that intersect the mine workings?

n. The second slide titled "Bedrock Groundwater Flow" includes "Historical observed uranium concentrations suggest a hydraulic connection from the mine pool to Ralston Creek" and "Timing suggests flow from the mine pool to RC correlates to increases in mine pool elevation". These statements appear to contradict the Environmental Protection Plan (EPP; last revised in 2017 through TR-23 approval), which states "Ralston Creek does not appear to be in strong hydraulic connection with the Schwartzwalder Mine based on stream flow rates, mine pumping rates, and isotopic comparison of mine water and surface water". Please provide additional clarification on these statements.

o. On the first slide titled "GW Inflow to the Mine", the second figure labeled "Mine Water level During Intermittent WTP Operation" includes data for an approximate 2 month period in 2017-2018 when the mine pool was pumped down to an elevation of approximately 6,424 feet msl, then allowed to refill to an elevation of approximately 6,447 feet msl prior to reinitiating pumping (elevation difference of approximately 23 feet). Please explain how this figure demonstrates "efficient seasonal drawdown for WTP operation". Does the operator have any recent data collected since 2018 to support this concept? If so, please update this information accordingly. Lastly, please describe the shortest amount of time it would take to safely lower the mine pool from completely flooded conditions to the regulatory limit of 150 feet below Steve Level.

p. The second slide titled "GW Inflow to the Mine" includes a cross section showing the mine workings, faults, and underground water sample locations. Please explain the "underground water quality sample locations" shown on this figure. When were these samples obtained, and for what purpose? Additionally, it appears the CV Glory Hole depicted on this figure (in which contaminated alluvial soils have been placed), connects to the Steve Level. Is this accurate? Lastly, please provide some discussion on whether the faults, pegmatites, and "Schwartz Trend" depicted on the figure are considered primary sources of groundwater inflow into the mine, and

whether any of these features might act as migration corridors for mine water downgradient of the site.

q. The slide titled "Historical Facilities" includes the waste rock piles and the mine pool. Would the fill placed in the valley near the mine also be considered an "historical facility" with respect to potential contaminant sources? Please update this slide as needed.

r. Please update the second slide titled "Historical Waste Rock" to reflect the new diversion ditch constructed on the NWRP and the removal of all but one of the site sumps.

s. Please update the first slide titled "Mine Pool" to reflect current pump depths of the mine pool and any other constituents of concern elevated in the mine pool (the last revised EPP includes sulfate, antimony, arsenic, iron, thallium, and radium 226; Section E.5.2.4 in Exhibit E of this application also includes chloride).

t. The second slide titled "Mine Pool" includes information on the in-situ treatment test conducted in 2013. The Division is aware of at least three other in-situ treatments which have been conducted at the site since that time. Please update this slide to incorporate all results from the in-situ treatment program. In Exhibit E, the operator indicates the mine pool may have reached equilibrium with respect to uranium concentrations and that fewer treatments may be needed moving forward. Please update this slide accordingly. How long might the in-situ treatments be a viable option for reducing uranium concentrations in the mine pool? Is there a point at which other undesired effects might occur with the continuation of this program (e.g., increased concentrations of other constituents of concern)?

u. Please update both slides titled "Groundwater Monitoring" to reflect the current approved groundwater monitoring program. These slides state "a few of (the monitoring wells) are dry". Please specify which of the "dry" monitoring wells have been dry since installation, and which ones dried up after the mine pool was dewatered. Please specify any background wells. Please specify any compliance wells (the last revised EPP states the original compliance well was MW-8, which was replaced with MW-12 in 2008). Were any numeric protection levels set for the compliance well? Please include the approved sampling frequency.

v. The slide titled "Surface Water Monitoring" shows the 13 surface water monitoring locations on Ralston Creek. Please include the approved sampling frequency. Additionally, please include some language that addresses the 6-7 monitoring locations located adjacent to mine facilities which are not sampled due to the creek flows being routed around the mine site. Please specify the compliance monitoring location (SW-BPL).

w. Please update the slide titled "Mine Reclamation" to include reclamation activities conducted at the site since 2018/2019.

x. The slide titled "High Mine Pool Alternative" describes a scenario in which the mine pool is allowed to rise above the creek elevation. Is this scenario still being contemplated for final reclamation? Please provide additional information on the "collection systems", "lower flow

treatment", "mine outflows and potential short-circuits" and "tracers". Please include some information regarding the wetland study recently conducted at the site. Did the results indicate this treatment system has potential for its use in final reclamation at the site?

y. The two slides titled "Data Issues – Hydrology" include a list of issues requiring additional evaluation, including the gaining/losing reaches of the creek, future flood impacts on waste dumps and other facilities, the Illinois Fault Zone as a "significant connection between the mine area and Ralston Creek", infiltration/groundwater recharge, mine inflows, seasonality effects on mine inflows, and the mine area capture zone and recharge area. Please update these slides to incorporate any studies that have been conducted to evaluate these issues, including what findings have come from any such studies.

z. Please update the slide titled "Data Issues – Chemistry" to incorporate any studies that have been conducted on the issues listed, including what findings have come from any such studies. Additionally, please explain the item "Uncertainty in upgradient (background) groundwater concentrations of U (i.e., MW-11)". Why is there uncertainty pertaining to the upgradient groundwater data? Also, the upgradient monitoring well at the site is MW-00, and not MW-11. The current approved monitoring program does not include MW-11. Please correct this slide accordingly.

aa. Please update the slide titled "Next Steps" to reflect activities that have been completed and any new activities planned.

29) The Division has the following comments regarding Appendix 2 – Tracer Test:

a. On page 117, the operator mentions "likely upward advective flow in both the #2 Shaft and the Jeffrey Shaft, driven by deeper groundwater inflow to the mine and water going into storage within open voids at the rising water table". Does the operator have any idea of the approximate portion of mine refill that can be attributed to deep groundwater infill versus that attributed to infill from the upper workings?

b. On page 117, the operator states "no tracers left the mine/WTP system as confirmed by sampling of the WTP treated-water discharge". Please explain how sampling of the WTP discharge confirmed that no tracers left the mine/WTP system. Did the operator also sample for the tracers at any of the groundwater or surface water monitoring locations?

c. On pages 119-120, the operator provides two possible scenarios to explain the marked changes in tracer concentrations observed (a dramatic drop in Fluorescein and an increase in Rhodamine WT) when the 60-hp pump was started in the Jeffrey Shaft in early June. The first scenario is a volume of lower concentration Fluorescein existed in the deeper portion of the #2 Shaft, advected into the Jeffrey Shaft, and reached the 60-hp pump. The second scenario is a volume of higher Rhodamine WT concentration existed in the deeper portion of the #2 Shaft and reached the 60-hp pump via the Jeffrey Shaft. Please provide additional explanation of these scenarios, including a graphic depiction of each. Do these results indicate that mine pool water quality samples (derived from the Jeffrey Shaft) may not be representative of the actual mine pool water quality?

d. On pages 121 and 123, under the "Mixing zone (Jeffrey shaft from 1100' to 410')" section, the operator states "Nearly all the tracer originally placed is not migrating towards the 60-hp pump or has somehow degraded within the system." Please describe the conditions under which the types of tracers used would be expected to degrade so quickly. Is there a chance the tracers may have reacted in some way with the WTP backfill slurry in the mine pool, causing them to degrade more rapidly or removing them from the "recycle/mixing system"?

e. On page 124, the operator states "During the duration of the tracer test, there was no flow leaving the mine as confirmed by the mine pool elevation being consistently below the regulatory limit of 150 ft below the Steve level". The 150 foot regulatory limit for the mine pool was established to create a hydraulic gradient away from Ralston Creek in the mine area. Has the operator conducted any studies to investigate potential migration pathways (e.g., fractures/faults, pegmatite veins, old exploratory drill holes) to the creek downgradient of the mine site?

f. On page 124, the operator states "The addition of sump water to the mine pool as previously discussed may have also contributed to the dilution/dispersion of the tracers". It is the Division's understanding that all sumps, besides Sump #1, had been taken offline at the time of the tracer study, and Sump #1 is dry much of the year. Please provide some additional discussion of how the minor volume of sump water added to the mine during the tracer study could have sufficiently diluted the mine pool in a manner that impacted tracer detection.

g. On page 124, the operator concludes "Regardless of the reason why only a small fraction of the tracers was not observed in the recycle/mixing system, it appears the mine pool has been sufficiently mixed, and the water quality samples are representative of the mine pool". Please provide additional explanation of how the results from the tracer study indicate the mine pool is "sufficiently mixed". Additionally, please explain how this determination correlates with the CSM which indicates the mine pool is stratified. Is the operator referring to only a particular portion of the mine pool being "mixed"? Has the operator considered other potential explanations for the tracer study results, including unaccounted for groundwater outflows, interactions between the tracers and the backfill slurry, and/or isolated portions of the mine pool which are not always in communication with the shaft(s) in which pumping occurs?

h. On page 124, the operator concludes "on the basis of the no tracer leaving the mine, the mine is a hydrologic sink, e.g., mine pool water is not exiting the mine". Based on the results presented, the Division is not convinced this study fully demonstrated the mine is a "hydrologic sink". In fact, the results seem to indicate the mine pool has more complex dynamics than originally thought, which may require additional investigation. Does the operator have plans to perform any additional studies to better characterize the mine pool and/or to investigate any significant migration pathways that may connect the mine pool to the creek downgradient of the mine site?

Exhibit F – Reclamation Plan Map (Rule 6.4.6):

30) Please provide an updated reclamation plan map which correlates with the reclamation plan provided in Exhibit E and the bond estimate provided in Exhibit L, if there are any proposed changes from what was approved in AM-5.

Exhibit L – Reclamation Costs (Rule 6.4.12):

31) The operator states "The revisions in Table L-1 reflect the reclamation plan presented in Exhibit E of this document…". However, Exhibit E did not include a reclamation plan that correlates with the bond estimate provided in this exhibit. Please be sure the information provided in this exhibit correlates with the reclamation plan provided in Exhibit E.

32) Each line item must be broken down to show how the unit cost was determined. This information can be provided on a separate table/sheet, if needed.

33) The Division has the following comments specific to the Water Treatment Plant Operations section:

    a. The RO system operation and stand-by costs must continue to cover a full 20-year period. Please adjust these costs accordingly.

    b. The discharge permit sampling costs must continue to cover a full 20-year period. Please adjust these costs accordingly.

    c. This section includes $30,000 for demolishing the water treatment plant. Please explain how this value was derived. Additionally, please ensure the reclamation plan in Exhibit E includes a detailed description of all components of the plant and associated infrastructure which would require demolishing and/or removal for reclamation, and the anticipated disposal location(s) for these materials.

    d. Please add costs for maintaining and operating the 60-hp pump for 6 months per year over a 20-year period.

    e. Please ensure costs for the regular replacement and disposal of components in the water treatment plant (e.g., filters, membranes) are included in this section. For materials that are hauled up to the Minnesota Mine for disposal, please ensure costs for doing this are incorporated into this line item.

34) The Division has the following comments specific to the In-Situ Treatment section:

    a. The in-situ injection costs must continue to cover a full 10-year period. Please adjust these costs accordingly.

    b. Please explain how the operator anticipates only 4 additional injections will be needed over the 10-year period.

    c. The mine pool sampling costs must continue to cover a full 10-year period. Please adjust these costs accordingly.

d. The mine pool sampling costs are based on 5 additional injections. However, the in-situ injection costs are based on 4 additional injections. Please make the necessary correction to ensure these items are consistent.

35) The Division has the following comments specific to the Alluvial Valley Excavation section:

a. This section does not include mobilization costs due to "Heavy equipment already onsite". Please be advised, the bond estimate must include all costs the State would incur in the event it had to take over reclamation liability of the site. Therefore, please add mobilization costs for the type and number of equipment needed to complete reclamation. Please be sure these costs are for mobilizing the equipment from the nearest rental facility which is known to have the equipment needed.

b. This section includes a line item for "Excavate contaminated soils". However, the Division could not find a line item for disposing of this material. Please include costs for this task which factor in the approximate haul distance for the disposal location(s).

c. The fill soil costs are for 1,889 cy of fill soil derived from on site, and hauled less than 1,000 feet for placement on 25,500 square feet (0.585 acre) of disturbance with an average depth of 2 feet. Please describe where exactly the operation intends to obtain this fill material from on site. Additionally, please clarify whether the estimated 0.585 acre of disturbance requiring fill pertains only to the South Zone. Based on the Division's last inspection conducted on September 14, 2021, it appeared the entire excavated area will require fill. Lastly, how did the operator choose an average depth of 2 feet when the excavation depth in the valley is said to vary from 0 to 10 feet?

d. The topsoil/plant medium costs are for 236 cy of topsoil derived from on site, and hauled less than 1,000 feet for placement on a disturbance of 25,500 square feet (0.585 acre) at an average depth of 3 inches. Please describe where exactly the operation intends to obtain this topsoil/growth medium from on site. The Division does not recall observing any topsoil stockpiles on site during inspections. If any topsoil will need to be imported to the site for reclamation, costs for this task must be incorporated into the bond estimate. Additionally, please clarify whether the estimated 0.585 acre of disturbance covers all disturbed areas in the valley which will require topsoil replacement. Lastly, please explain how replacing only 3 inches of topsoil will be sufficient to achieve successful revegetation at the site. Based on the Division's experience, a topsoil replacement depth of less than 6 inches is typically not sufficient to achieve successful vegetation.

e. The seed mix costs are for the "Seed mix shown in Table E-1 of Application Amendment #5" to seed a total disturbance of 12.7 acres. Firstly, please be sure to include this seed mix in the reclamation plan provided in Exhibit E. Additionally, please explain why the bond estimate includes costs for retopsoiling only 0.585 acre, but seeding 12.7 acres. The acreages for these tasks should correlate, unless a portion of the 12.7 acres has already been retopsoiled.

f. This section includes costs for "Riparian trees for Phase 1 mitigation" (174 trees) and "Willow stakes for Phase 1 mitigation" (615 willows), described as "Remaining habitat restoration above the cutoff wall and 18" creek bypass pipeline". Firstly, please be sure to include this plant mix in the reclamation plan provided in Exhibit E. Secondly, please specify exactly where this "Phase 1 mitigation" area is located (and be sure to identify it on the Exhibit F reclamation plan map). Additionally, please provide an estimated acreage to receive these riparian and willow tree plantings. Lastly, please list the species, number of species per acre, and specify if the trees/willows will be transported as tublings, bare root seedlings, or containers.

g. This section includes costs for "Riparian trees for Phase 2 mitigation" (147 trees) and "Willow stakes for Phase 2 mitigation" (482 willows), described as "Habitat restoration below the cutoff wall and 18" creek bypass pipeline". Firstly, please be sure to include this plant mix in the reclamation plan provided in Exhibit E. Secondly, please specify exactly where this "Phase 2 mitigation" area is located (and be sure to identify it on the Exhibit F reclamation plan map). Additionally, please provide an estimated acreage to receive these riparian and willow tree plantings. Lastly, please list the species, number of species per acre, and specify if the trees/willows will be transported as tublings, bare root seedlings, or containers.

h. This section includes a line item for hydromulching, but no costs are included due to "Only required on 2H:1V and steeper slopes, which are not present in the valley". Will areas to be revegetated in the valley require any mulching? If so, please include costs for this item, and specify the type of mulch to be used, the application method, and the application rate per acre. Please also include an estimated acreage to receive the specified mulch application.

i. This section includes line items for "Excavator", "Loader", "Dozer", and "Haul truck", but no costs are included due to "Equipment costs included in unit cost ($/cy) for soils". Please be advised, all bond estimates must include costs for mobilizing and demobilizing the necessary equipment to the site (from the nearest rental facility that sells this equipment) to complete all reclamation, in the event the State had to take over reclamation liability of the site. These costs should be separated from any operational costs. The operator may include a separate equipment mobilization/demobilization line item for each applicable reclamation section presented in the bond estimate, or include one combined equipment mobilization/demobilization line item at the end of the estimate. Please be sure to specify the type and number of equipment needed.

36) The Division has the following comments specific to the Environmental Monitoring section:

a. The surface water monitoring costs must continue to cover a full 10-year period. Additionally, these costs must be based on the required quarterly sampling frequency (worst-case scenario), regardless of whether the creek is dry or inaccessible some months in the year. Please adjust these costs accordingly.

b. The groundwater monitoring costs must continue to cover a full 10-year period. Additionally, these costs must be based on the required quarterly sampling frequency (worst-case scenario), regardless of whether any wells are dry or inaccessible some months in the year. Please adjust these costs accordingly.

c. This monitoring well abandonment costs are for abandoning 13 wells at $2,000 per well. Please be sure to describe how monitoring wells will be sealed in the reclamation plan provided in Exhibit E. Additionally, please explain how the $2,000 estimate was derived. Given the various depths of the monitoring wells on site, the abandonment costs could vary fairly significantly. Therefore, it may be more appropriate to split this line item into two separate tasks, including an average abandonment cost for alluvial wells and an average abandonment cost for bedrock wells.

d. The sump removal/abandonment costs are for abandoning/removing 5 sumps at $2,000 per sump. Please be sure to describe how any sumps will be abandoned/removed in the reclamation plan provided in Exhibit E. Additionally, it is the Division's understanding that only one sump remains in operation at the site, as the others were to be removed during the valley excavation project. Are there currently four additional sumps which have not yet been removed from the valley? Lastly, please explain how the $2,000 estimate was derived.

37) The Division has the following comments specific to the Mine Opening Closure: Minnesota, Sunshine, & Steve Adits, Gate Closure section:

a. No costs are included for closure of the Minnesota, Sunshine, and Steve Adits due to "Gate closure already in place". Please be sure to describe how these mine openings are sealed in the reclamation plan provided in Exhibit E. Additionally, please explain why a backfill closure is not planned for these mine openings, as is planned for the Pierce Adit, CV/Charlie Adit, and Black Forest openings.

38) The Division has the following comments specific to the Mine Opening Closure: Pierce Adit & CV/Charlie Adit, Backfill Closure section:

a. This section includes costs for backfilling, retopsoiling, and revegetating the Pierce and CV/Charlie Adits (similar to what was approved for the Black Forest mine openings in AM-5). While the revised reclamation plan map approved in AM-5 indicates these openings will be backfilled, a detailed reclamation plan for reclaiming these mine openings was not provided. Please be sure to describe how these mine openings will be reclaimed in the reclamation plan provided in Exhibit E.

b. The fill soil costs are for 60 cy of soil derived from on site, with a haul/push distance of less than 1,000 feet. Firstly, please describe where exactly the operation intends to obtain this fill material from on site. Additionally, please explain how the volume of fill material required for reclaiming both of these adits, which are located approximately 1,400 feet apart, is exactly the same as the volume of fill material required for reclaiming the Black Forest mine openings.

c. The topsoil/plant growth medium costs are for 161 cy of topsoil derived from on site, with a haul/push distance of less than 1,000 feet. The total cost provided for this task ($145.00) is inaccurate based on the operator's estimate of 161 cy x $14.50/cy, which should give a total of $2,334.00. Please correct this error. Please describe where exactly the operation intends to obtain this topsoil/growth medium from on site. If any topsoil will need to be imported to the site for reclamation, costs for this task must be incorporated into the bond estimate. Additionally, please

explain how the volume of topsoil required for reclaiming both of these adits is exactly the same as the volume required for reclaiming the Black Forest mine openings. Lastly, please provide an estimate acreage to receive topsoil replacement and the approximate replacement depth.

d. The seed mix costs are for seeding 0.1 acre with the "Seed mix shown in Table E-1 of Application Amendment #5". Please be sure to include this seed mix in the reclamation plan provided in Exhibit E.

e. Please explain how the quantity of hydromulch (10 cy) is exactly the same for reclaiming both of these adits as the quantity required for reclaiming the Black Forest mine openings.

f. Please explain how the volume of rock fill (4 tons) is exactly the same for reclaiming both of these adits as the volume required for reclaiming the Black Forest mine openings.

39) The Division has the following comments specific to the Mine Opening Closure: Black Forest Mine, Backfill Closure section:

a. The total costs provided for reclaiming the Black Forest mine openings is $9,276.00, which is $2,189.00 less than the direct costs approved for this project in AM-5 ($11,465.00). The Division believes this is due to an error with the topsoil/plant growth medium costs, which are listed as $145.00, but should be $2,334.00 based on 161 cy x $14.50/cy. Please adjust these costs accordingly.

40) The Division has the following comments specific to the Cost Total section:

a. The subtotal of direct costs provided in this section is $3,531,618.80. However, based on the costs provided in the bond estimate, the Division calculates the subtotal of direct costs to be $3,550,170.80 (which is $18,552.00 more than the operator's estimate). The Division realizes some of the costs in the bond estimate may change in the revised application. Therefore, please be sure the subtotal of direct costs is accurate in the updated bond estimate.

b. The grand total provided in this section is $3,858,293.54, which is based on the addition of 9.25% indirect costs. Firstly, the Division's indirect costs typically range from 22.5% to 24.5%, which far exceeds the 9.25% estimated by the operator. Additionally, as mentioned above, the subtotal of direct costs provided does not appear to be accurate based on the costs provided in the bond estimate, which means the grand total provided is not accurate. [According to the Division's calculations, the grand total would be $3,878,561.60, based on the addition of 9.25% indirect costs (a difference of $20,268.06).] The Division realizes some of the costs in the bond estimate may change in the revised application. Therefore, please be sure the grand total is accurate in the updated bond estimate.

41) Please add a section to the bond estimate that includes costs for removing/demolishing and disposing of all structures proposed to be removed for final reclamation (besides the water treatment plant and associated structures, as this information is requested under the Water Treatment Plant Operations section). This section should correlate with the reclamation plan provided in Exhibit E. For example, if

the operator is proposing in Exhibit E to remove the bypass pipeline and re-establish creek flows across the site, costs should be provided for removing/demolishing and disposing of all structures associated with the pipeline, including the pipeline itself, any safety bollards holding the pipeline in place, the upgradient cutoff wall, etc.

42) Please add a section to the bond estimate that includes costs for reclaiming the equipment storage area (estimated to be approximately one acre in size) located north of the creek. For example, are there any permanent structures to be removed/demolished from this area? Will this area be ripped, retopsoiled, and revegetated for final reclamation? This section should correlate with the reclamation plan provided in Exhibit E.

Exhibit U – Designated Mining Operation Environmental Protection Plan (Rule 6.4.21):

43) The operator states "This information is presented in Technical Revision 23, Attachment B Schwartzwalder Mine Environmental Protection Plan (Whetstone Associates Inc., 2016) and was updated in the 2021 Mine Plan Amendment 5". The Division reviewed the last approved Environmental Protection Plan (EPP) for the site, which was submitted with TR-23 (approved on March 17, 2017), and found several sections to be out-of-date. This exhibit was not updated through AM-5. According to the general description of this amendment (on page 5 of the application form), updating the EPP is intended to be part of this application (to meet Condition #2 of SO-1 approval). Therefore, please review the last approved EPP and provide (in this exhibit) updated information for all applicable sections. The EPP must conform to all requirements of Rule 6.4.21.

44) Rule 1.1(21) describes an Environmental Protection Facility (EPF) as "a structure which is identified in the Environmental Protection Plan as designed, constructed and operated for control or containment of designated chemicals, uranium, uranium by-products or other radionuclides, acid mine drainage, or toxic or acid-forming materials that will be exposed or disturbed as a result of mining or reclamation operations". At this time, only the two existing waste rock piles have been considered EPFs at the Schwartzwalder Mine. However, based on the definition provided above, the Division has determined the water treatment plant and the bulkheads installed in the Steve and Pierce Adits should also be considered EPFs. Therefore, please ensure the updated EPP incorporates these additional EPFs. Because these facilities have already been constructed, the requirements of Rules 7.3 and 7.4 pertaining to design and construction requirements and facility certification and inspection do not apply. However, the operator will need to provide a detailed description of these facilities and demonstrate how they have been designed to prevent impacts to surface and groundwater systems. The operator will also need to provide a list of all chemicals and/or hazardous materials used or stored in these facilities.

Emergency Response Plan (Rule 8.3):

45) The operator states "This exhibit has not changed from 2012 Mine Plan Amendment 3". AM-3 (approved on June 11, 2012) did include a copy of the Surface Facility Emergency Response Plan associated with The Cotter Corporation's Radioactive Materials License, revised on July 19, 2010. Per Rule 8.3.2, operators that are required to submit an Emergency Response Plan, may submit all or portions of a plan required by another state, local, or federal agency that has been required of the operator, if it substantially conforms to the minimum requirements (listed in this Rule). However, the Emergency Response Plan

submitted in AM-3 is out of date and does not reflect the current operator, site personnel, and facilities. Therefore, please submit an updated Emergency Response Plan for the site which meets the requirements of Rule 8.3.

Additional Item(s):

46) Please describe how you intend to address the jurisdictional issues raised by City of Arvada and Denver Water in their objection letters (sent to you on September 15, 2021).

This concludes the Division's preliminary adequacy review of AM-6. Please ensure the Division sufficient time to complete its review process by responding to these adequacy items no later than three weeks prior to the decision date, by **December 5, 2021.** If additional time is needed to respond, you must submit an extension request to our office prior to the decision date.

Please remember that, pursuant to Rule 1.6.2(1)(c), any changes or additions to the application on file in our office must also be reflected in the public review copy which was placed with the County Clerk and Recorder. Pursuant to Rule 6.4.18, you must provide our office with an affidavit or receipt indicating the date this was done. This "proof" should be submitted with your adequacy response.

If you have any questions, you may contact me by telephone at 303-866-3567, ext. 8129, or by email at amy.eschberger@state.co.us.

Sincerely,

Amy Eschberger
Environmental Protection Specialist

Cc: Paul Newman, Colorado Legacy Land, LLC
Eric Williams, Colorado Legacy Land, LLC
Elizabeth Busby, Ensero Solutions US, Inc.
Billy Ray, Ensero Solutions US, Inc.
Michael Cunningham, DRMS