

# EXTERNAL MEMORANDUM

**To:** Ms. Roberta Hudson  
SD DANR, Minerals & Mining  
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Pierre, SD 57501

**From:** Mr. Ken Nelson  
Mine General Manager  
Coeur Wharf  
10928 Wharf Road  
Lead, SD 57754

**Date:** October 13, 2022

**Subject:** Response to July 2022 DANR Comments on Wharf's Boston Expansion Large Scale Mine Permit

Wharf submitted a Large Scale Mine Permit to the South Dakota Department of Agriculture and Natural Resources (SD DANR) on June 13, 2022. Procedural completeness and technical comments were received from SD DANR in two letters dated July 13, 2022 and August 16, 2022. The revised application report and attachments are intended to address comments from both letters, while this response to comments memo specifically addresses comments from the July 13, 2022 letter. Wharf responses are in red.

1. Application Form: Please change the proposed summer 2022 starting date on the application. With the current application review timelines, the earliest the mine permit will be issued is the fall of 2022.

In addition, the size of area to be worked at any one time that is listed on the application form is 50 acres. However, in Section 5.2 of the Mine Plan, it states the area to be worked at any one time is 15 to 30 acres. Please clarify the correct size of area to be worked at any one time and revise the acreage on the application form and in Section 5.2 of the Mine Plan as necessary.

The application form has been updated to indicate the start date will be winter 2022 (pending permit issuance). The size of the area to be worked at any one time is correct in Section 5.2 and updated on the form.

2. Certification of Applicant Form: Please note that Wharf Resources will need to attach a sheet disclosing all notices of violation and enforcement actions issued to the company by the department during the life of the mine. Disclosures will not automatically result in denial of the application.

The list of notices of violations has been added to Appendix A.

3. SDCL 45-6B-6(4) and ARSD 74:29:02:03: On the mine permit application form, Homestake Mining Company is identified as a 50 percent mineral owner of the Precambrian. However, Homestake is not mentioned in Section 2.4 on page 13 of the Property Description. Please discuss the status of Homestake's mineral rights in this section. Also, a map showing mineral ownership, including Homestake's, is required to be submitted with the mine permit application.

The Homestake Mining Company is a 50 percent mineral owner of the Precambrian minerals, though no Precambrian rock is proposed to be mined. New Exhibit 4B shows mineral claims in the Boston Expansion area.

4. SDCL 45-6B-6(8(b), 8(c), and 8(d)), ARSD 74:29:02:04(1 through 6), and ARSD 74:29:07:14(2): Under Section 5.3.4 on page 72 of the Mine Plan, in addition to referring to the pit cross sections and the final elevation, please describe the total depth of the Boston Pit. In addition, please include more details on the mining sequence, including where waste rock from the Boston Pit will be disposed and a detailed timeline on waste rock disposal and pit backfill in the pit. Finally, please show on a labeled map the locations where waste rock and spent ore from the Boston Pit will be disposed.

The deepest pit floor will be at an elevation of 6,260 feet. The maximum pit depth of approximately 320 feet will occur in the Flossie area (south of Sunshine/Portland).

The majority of the Boston Expansion area will be mined concurrently with Portland (as it's a highwall pushback) so the last section of the Boston Expansion area will be mined out in 2029 (the end of mine life). Backfill would be concurrent with mining, following shortly behind the areas that have been mined out. For example, West Flossie is scheduled to be mined out in October 2023 and backfill would begin soon after that in approximately November 2023.

Waste rock will be placed within the entire full pit extent within the Boston Expansion shown on Exhibit 23, and labeled as backfill on cross-sections in Exhibits 32 through 37. No spent ore will be placed in the Boston Expansion; spent ore derived from the Boston Expansion project will be placed in the American Eagle POP as shown on new Exhibit 38.

Also, even though there is some discussion of the post mine topography, there is no narrative of the pre mining topography in Sections 5.3 and 5.4 of the Mine Plan. Please address the pre mining topography in either of these sections. Also, please identify the blasting agents to be used and discuss the storage of these agents in Section 5.3.5 of the Mine Plan.

The pre-mining topography of the Boston Expansion was discussed in Section 2.1. Reference to that section has been added to Section 5.3.4.

Blasting agents used and storage of these agents will be the same as is currently used at the Wharf Mine. Industry standard ammonium nitrate and fuel oil (ANFO) and emulsion is used as the blasting agent, with blasting conducted by a local licensed contractor.

In the fourth paragraph on page 69 of Section 5.2 of Mine Plan, Wharf references a 2021 slope stability analysis of the Boston Pit area conducted by Fritch and Haugen. Since a stability analysis for all critical earth structures is required under ARSD 74:29: 02:04(5), please include a copy of this analysis with the mine permit application. Also, does the Fritch and Haugen report contain an analysis of the stability of the backfilled Boston Pit?

A copy of the geotechnical stability report by Fritch and Haugen has been attached to Appendix P. The stability analysis conducted was for push-back or expansion of the Portland Pit south into the Boston Expansion area as well as the Green Mountain Pit. The report did not evaluate the stability of the backfilled pit; though based on general geotechnical engineering principals, because the highwall is predicted to be stable during excavation and mining, the highwall will have increased stability during and after backfilling.

5. SDCL 45-6B-7(4), (5), and (10): Please include a letter from Stan Michals of the Department of Game, Fish and Parks approving ICF as the wildlife survey consultant in the mine permit application. Also, the results of the spring 2022 bat emergence survey are required to be submitted as part of the Wildlife Survey before the application can be considered complete. In addition, please include a statement or paragraph summarizing any significant historic, archaeologic, geologic, scientific, or recreational features in the Boston Expansion area. Finally, please include a narrative and show on a map the location of any proposed reservoirs tailings ponds, tailings disposal, dams, dikes, and diversion canals. Exhibit 23 as referenced in Table 1-1 does not show these features.

A letter from the SD GFP approving the wildlife contractors is now attached to Appendix A. The results of the bat emergence survey are now attached to Appendix J. No significant historic, archaeologic, geologic, scientific, or recreational features occur in the Boston Expansion area; a bulleted list stating such was included in Section 2.5. The Boston Expansion project does not include any new reservoirs tailings ponds, tailings disposal dams, dikes or diversion canals. The reference to Exhibit 23 for statute SDCL 45-6B-7(10) in Table 1-1 has been removed.

6. SDCL 45-6B-8: Please discuss all areas of the Boston Expansion Loring Quarry that were disturbed by surface mining prior to July 1, 1971, and show the locations on a map. Only underground mine locations are addressed in the mine permit application.

Current Wharf staff are unaware of any surface mining in the Boston Expansion area prior to 1971. All areas disturbed by Wharf as part of the Boston Expansion will be reclaimed.

7. SDCL 45-6B-9: Please address the reclamation potential of the areas with underground workings in the Boston Expansion area. It would also be helpful if a map was included showing only the underground workings in the Boston Expansion area in addition to Exhibit 5 which shows all underground workings at the Wharf Mine.

There is not expected to be any reclamation potential of underground workings in the Boston Expansion area given the entire working mine disturbance will be backfilled. Exhibit 5 shows all of the historic underground workings at the Wharf Mine, including those within the Boston Expansion.

8. SDCL 45-6B-7(8), SDCL 45-6B-10, ARSD 74:29:01:17, ARSD 74:29:02:09 and ARSD 74:29:02:12: All maps in the mine permit application are required to comply with the requirements of SDCL 45-6B-10 and ARSD 74:29:02:12. Therefore, several revisions are required for the maps submitted with the mine permit application.

First, all maps in Appendix B need to identify the statute and regulation it is addressing. Also, the cross sections in Exhibits 7 through 10, Exhibits 17 through 19, and Exhibit 11 need a clearly identified scale. In the cross sections, we need something more clearly identifiable than the VE = 1 included on the map. In addition, Exhibits 11 through 16 and Exhibit 30 do not clearly show township, range, and section. Finally, Exhibit 31 needs a specific date the map was prepared. It currently has a date prepared as, "never".

To fulfill the requirement of ARSD 74:29:02:12(4), exhibits provided in Appendix B are included in Tables 1-1 and 1-2 to identify which statutes and laws the map is intended to fulfill. Some exhibits fulfill multiple requirements. A scale has been added to Exhibits 7-11, and 17-19. Section, township, and range are shown on Exhibit 30, and date has been added to Exhibit 31.

Also, in Table 1-1, Wharf Resources identifies Exhibits 4 and 28 as maps that show the expected physical appearance of the affected land and the portrayal of the proposed final land use. Since Exhibit 4 is a surface ownership map and Exhibit 28 is a topsoil stockpile cross section, these exhibits do not address the requirements of SDCL 45-6B-7(8). Please refer to the correct Exhibits that address the requirements of the statute.

Table 1-1 has been corrected to identify Exhibits 31-37.

9. SDCL 45-6B-7(12) and ARSD 74:29:02:08: Wharf Resources is required to submit a detailed cost analysis showing how the \$45,400 reclamation cost estimate for the Boston Expansion area was determined. The detailed estimate should show a cost breakdown of backfilling the pit, grading backfilled material, placing topsoil, seeding, applying fertilizer and mulch, and other reclamation costs. A detailed estimate is also required for any areas where spent ore from the pit will be placed.

A new table with detailed reclamation costs for the Boston Expansion has been added. This data was derived from the SD DANR BONDALC spreadsheet program.

10. SDCL 45-6B-10(2) and SDCL 45-6B-44: Wharf Resources is required under SDCL 45-6B-44 to consult with adjacent landowners Ross and Amber Determan during development of the reclamation plan. The instrument of consultation can consist of a written receipt from the adjacent landowners stating that they received a copy of the reclamation plan.

Adjacent landowners, Ross and Amber Determan, have been provided with information regarding the reclamation plan. Confirmation will be forwarded to SD DANR.

11. SDCL 45-6B-32(1 through 8): Wharf Resources is required to address each subsection of this statute.

Each subsection of SDCL 45-6B-32 has been addressed within the mine permit application and referenced in Table 1-1.

12. SDCL 45-6B-33(1 through 8): Wharf Resources is required to address each subsection of this statute.

Each subsection of SDCL 45-6B-33 has been addressed within the mine permit application and referenced in Table 1-1.

13. SDCL 45-6B-37 and ARSD 74:29:07:04(1, 2, 3, 4, 5, and 7): Please address subsections 1, 2, 3, 4, 5, and 7 of ARSD 74:29:07:04.

In the grading plan in Section 6.2.1.1 of the Reclamation Plan, please describe in detail how the backfilled Boston Pit will be graded to slopes which are visually and functionally compatible, structurally stable, and suitable for the post mining land use.

Grading will occur after backfilling with waste rock. Grading is primarily completed with dozers and in a manner similar to established successful reclamation at other areas of the Wharf and Golden Reward mines.

In addition, please describe in detail how the regraded pit will blend in with the surrounding undisturbed area.

As shown on the post-reclamation contours in Exhibit 31 compared to the current topography in Exhibit 2, the final regraded pit contours will blend with the surrounding undisturbed area and closely mimic pre-mining topography. The western portion of the Boston Expansion that will be disturbed will be regraded to a similar pre-mining slope towards the southwest. The eastern portion of the Boston Expansion also currently slopes towards the southwest and will have a similar slope and drainage after reclamation.

Also, please describe in detail how grading will control erosion and sedimentation, how the existing drainage will be preserved during final grading, and how areas outside the affected land are protected from slides during final grading.

In general, temporary surface runoff diversions and erosion control structures (e.g. hay bales, wattles, and silt fencing) will be constructed in soils or unconsolidated materials and seeded as soon as practical. The topographic grading itself will help reduce erosion because the original drainages will be preserved. No perennial, intermittent, or ephemeral streams occur in the Boston Expansion. However, the southwest edge of the expansion currently has a draw that is oriented northwest in the Annie Creek watershed. No slides or earth movement are anticipated because the backfilled slopes are graded at 3:1 or less and backfilled material has proven stable in other areas of the mine.

In addition, please describe how landforms created by grading will be compatible with surrounding areas and if depressions will be created for the accumulation of water.

As discussed above, the topography or landforms created during grading of the Boston Expansion will be similar in slope and orientation as current, pre-mining topography, and as such will be compatible with surrounding areas. During final grading, minor undulations in topography will be randomly created on the landscape to promote the accumulation of water which will promote vegetation diversity and reduce runoff.

Finally, please include a timetable for grading during concurrent reclamation. Table 5-1 includes a timetable for overall reclamation, but not specifically grading.

For the Boston Expansion, reclamation including grading, will generally occur from east to west as the pit expansion occurs and mining progresses to the west.

14. SDCL 45-6B-39 and ARSD 74:29:07:06(1 and 4): In Section 6.2.1.3 of the Reclamation Plan and in Appendix Q, Wharf refers to January 2011 letters from the Lawrence County NRCS which was submitted for the Mine Permit 476 application and letters and emails concerning Lawrence County NRCS seed mix consultation for EXNI-438, which was referred to as the seed mix consultation for the Boston application. Even though the seeds mixes are similar, please note that Wharf cannot use these consultations as proof of consultation for the proposed Boston Expansion mine permit application since it is a new application. Therefore, please submit proof that the Lawrence County NRCS office was consulted during development of the seed mix for the Boston Expansion mine permit application.

Finally, please include details on which circumstances will determine whether spring or fall seeding timeframes will be used.

The proposed seed mix for the Boston Expansion was submitted to the Lawrence County NRCS office in September 2022. Proof of consultation will be forwarded to SD DANR upon receipt.

15. SDCL 45-6B-40 and ARSD 74:29:07:07(2, 3, 4, 6, 7, and 8): Section 5.3.3 of the Mine Plan states that 28,921 cy of topsoil is salvageable from the Boston Expansion area which is based on an average salvage depth over the proposed 48.2-acre disturbed area. However, the Soil Survey in Appendix E states that 29,275 cy is salvageable, which is based on field and other results. It appears that the salvage estimate in the Soil Survey should be more accurate than the estimate in Section 5.3.3. Therefore, please clarify the actual amount of topsoil that is available for salvage.

The soil salvage information in the application is correct and is based on an average salvage depth of 4.38 inches over the proposed disturbance of 48.2 acres. The soil survey in Appendix E was completed prior to finalization of the disturbance area boundary and used a slightly larger disturbance area of 49.75 acres.

Please discuss how Wharf Resources plans to label topsoil stockpiles during the mining operation. In addition, please discuss plans to remove large rocks, tree stumps, and other objects from topsoil prior to stockpiling. Also, please address whether amending suitable material for topsoil will be required for the Boston Expansion area.

During the entire Boston topsoil grubbing effort, topsoil will be placed in stockpiles and labeled with a placard saying "topsoil" as per normal operating practices. During this process, large boulders, trees, and rootballs will be segregated as much as possible and removed. Final segregation of any remaining large, non-soil components occurs during the dozer application of the topsoil veneer to reclaimed slopes, where the approximate 6-inch depth application forces any larger components out to the side.

The following sentence has been added to Section 3.12.1. "If reseeded reclamation areas do not show adequate growth after two years, fertilizer requirements of the placed topsoil will be conducted to determine soil nutrient levels and appropriate additional fertilization requirements."

Please address subsections 2 and 8 of this regulation regarding the temporary distribution of stockpiled topsoil and topsoil substitutes.

The following text was added to Section 6.4: "In accordance with ARSD 74:29:07:07(2), a portion of stockpiled topsoil may be used during interim reclamation; the productive capabilities will not be diminished, the soil will be protected from erosion by seeding, and the topsoil will be available for final reclamation."

As discussed in Section 5.3.3, a suitable amount of topsoil is available from the Boston Expansion for reclamation, therefore additional subsoil or a topsoil substitute is not anticipated for reclamation in the Boston area (ARSD 74:29:07:07(8)).

In addition, in the first paragraph in Section 5.3.3 on page 71 of the Mine Plan, Wharf states that topsoil will be stockpiled in the existing Juno or possible future Bald Mountain topsoil stockpile. The Juno topsoil stockpile is shown in Exhibit 27, but there is no map showing the Bald Mountain topsoil stockpile location. Since there is potential to use the Bald Mountain topsoil stockpile in the future, please submit a map showing the possible location of the stockpile. Also in this section, Wharf states in the third paragraph that topsoil and subsoil stockpiles are shown on Exhibit 27. However, Exhibit 27 is labeled as a topsoil stockpile map and only shows a topsoil stockpile. Where are the subsoil stockpiles on the map?

At this time, Wharf does not anticipate a Bald Mountain area topsoil pile due to distance. Additionally, no subsoil stockpiles are planned. The text in the application has been revised.

In the second paragraph on page 71 of Section 5.3.3, Wharf states there will likely be surplus topsoil after all of it is salvaged and used in reclamation. However, in the last paragraph of this section on page 72 of the Mine Plan, Wharf discusses the success of revegetation in subsoil at the reclaimed Bald Mountain Historic Tailings. Please discuss the relevance of including Bald Mountain Tailings subsoil revegetation in this section since there appears to be adequate topsoil for final reclamation. If Wharf plans to salvage topsoil and subsoil, separate the reclamation uses for each and where these soils are proposed to be utilized in reclamation.

The last paragraph of Section 5.3.3 has been deleted as the Bald Mountain Tailings subsoil revegetation is not directly relevant to the Boston Expansion.

16. SDCL 45-6B-41, ARSD 74:29:02:11(8, 9, 11, and 13), ARSD 74:29:07:08(1, 2, 3, 6), and ARSD 74:29:07:09: A more detailed sedimentation and erosion control plan needs to be submitted showing the dimensions, locations, spacing, and design of sediment and erosion control structures for the Boston Expansion area and a detailed plan to remove these structures after final reclamation is completed. The plan can be considered conceptual at this time. Wharf can include sections from its Stormwater Pollution Prevention Plan in addressing these items.

Please show on a map the location of the diversion ditch around the Boston Pit as described in Sections 3.4.4 and 6.2.1.4, which will be constructed to limit water drainage to the bottom of the pit. Also, in the second paragraph on page 94 of Section 6.2.1.4, please address whether diversion channel slopes excavated in rock will be stable, if any culverts will be required, and whether the diversion channel will be constructed to carry the flow from a minimum two-year, six-hour storm event.

No permanent sediment or erosion control structures are planned. Language about a diversion ditch has been removed. Wharf is, and will continue to remain, consistent with the site storm water pollution prevention plan (SWPPP).

In addition, please address whether Wharf Resources has obtained the proper water rights permits to temporarily impound water in the Boston Pit. Also, please address whether any dredge and fill permits will need to be obtained from the US Army Corps of Engineers during the project.

Wharf does not anticipate there to be any impound water in the Boston Expansion area, therefore no water rights permitting is required. The minimal occurrences of pooled water at the pit bottom would be a result of meteoric events. If the pooled water does not readily infiltrate into the ground, it would be pumped out if necessary or as required. The Boston Expansion project does not entail the dredging or filling of material in wetlands or other surface water bodies. A permit from the US Army Corp of Engineers is not required for this project.

In Section 3.5.6 on page 42 under Baseline, please include a more detailed meteorological plan. Even though meteorological data is associated with air quality monitoring discussed in section 3.5, a meteorological monitoring plan is required under the hydrologic balance requirements of ARSD 74:29:02:11 and should be addressed under hydrologic monitoring instead of air quality monitoring.

The meteorological monitoring program discussion has been relocated under hydrologic monitoring instead of air quality monitoring (ARSD 74:29:02:11). The section has also been slightly expanded.

In Sections 3.3 and 3.4, regarding the discussion of project water requirements, please include a discussion on the potential impacts to the quality and quantity of the water resource. Also, please address whether any pollution control facilities are required for the Boston Expansion project.

Potential impacts to groundwater have been added to Section 3.3 and discussed further in the Boston Expansion groundwater characterization study (Appendix F). No pollution control facilities are anticipated for the Boston Expansion project. Impacts to surface water are anticipated to be minimal as discussed in Section 3.4.

Wharf also needs to include the results of the 2022 spring survey before the application can be considered complete.

The spring survey memo is already provided in Appendix F, sub-Appendix J. A summary of the spring survey has also been added to Section 3.3.4.

17. SDCL 45-6B-46: Please address each subsection of this statute.

The subsections of this statute have now been addressed in Section 6.6 Seeding.

18. SDCL 45-6B-91: In Section 6.10.2 of the Reclamation Plan, please address treatment of tailings, such as spent ore, from the Boston Expansion area during the postclosure period. Also, in Section 6.10.2.7, Wharf needs to discuss what changes will be needed to the current postclosure bond as a result of the Boston Expansion project. Any calculations associated with the changes need to be included.

Wharf does not anticipate the need for treatment of spent ore from the Boston Expansion during post closure. No changes to the post closure bond are anticipated as there are no projections for treatment or additional monitoring for the Boston Expansion.

19. SDCL 45-6B-92: Please address the following comments on critical resources listed in Section 3.12 under Baseline:

1. Wildlife – Wharf needs to include details on bat mitigation measures in Section 3.12.5 since bats are considered a critical resource in the Boston Expansion area;

A discussion on the bat minimization was added to Section 3.12.5.

2. Aquatic Resources – Wharf needs to discuss cold water fish life mitigation in Section 3.12.6, including additional water quality parameters besides nitrate that will need to be monitored to assess impacts;

As noted in Section 3.12.6, no impacts to cold water fisheries are anticipated.

3. Vegetation – Wharf needs to include detail on mitigating impacts to mountain huckleberry in Section 3.12.4 since mountain huckleberry is considered a critical resource in the Boston Expansion area;



Mountain huckleberry transplant efforts and reference to the associated memorandum have been added to Section 3.12.4.

7. Cultural Resources – Wharf needs to mention in Section 3.12.7 that site 39LA0376 is eligible for the National Register of Historic Places;

The site eligibility has been added to Section 3.12.7.

9. Noise – Please explain in Section 3.12.8 why noise is only being monitored through 2022; and

Wharf intends to continue to monitor noise for the foreseeable future. For clarity, the section has been edited to remove the note about continued monitoring throughout 2022.

10. Land Designated as Special, Exceptional, Critical, or Unique – Please add a subsection to Section 3.12 that addresses the department's designation that the Boston Expansion area was not eligible for the Preliminary List of Special, Exceptional, Critical, or Unique Lands.

New Section 3.12.10 was added per DANR recommendation. Note that such information was and is also contained in Section 2.5.

20. ARSD 74:29:02:01: Table 1-1 and Table 1-2 have numerous errors and omissions that need to be corrected. They are as follows:

Table 1-1:

- a. SDCL 45-6B-6: Since SDCL 45-6B-6 refers to the application form, Appendix A should be listed as the primary Permit Application Reference for subsections 1, 2, 3, 4, 5, 9, and 10 of this statute since these items are on the form. Wharf can include the other items listed for each subsection as support documentation.
- b. SDCL 45-6B-7(5): This statute requires a statement of any characteristics of the affected land of historic, archaeological, geologic, scientific, or recreational significance. In the Permit Application Reference for this statute, Wharf does not reference a statement, but makes reference to Section 2.3 which has nothing to do with the requirements of this statute. It also refers to sections with details on Geology, Cultural, and Recreation. Wharf needs to include a reference to the statement required by this statute and remove the reference to Section 2.3. Wharf can refer to the Geology, Cultural, and Recreation sections to support the statement.
- c. SDCL 45-6B-7(6): Wharf needs to change the Permit Application Reference from Section 6.2 to Chapter 6.0 since each statute referred to by this statute is addressed throughout the reclamation plan in Chapter 6.
- d. SDCL 45-6B-7(7): In the Permit Application Reference, you refer to Section 5.3.4 which addresses pit development and sequencing. There is nothing in Section 5.3.4 that addresses how the reclamation plan will rehabilitate the affected land. Section 5.3.4 pertains to the reclamation plan, not the operating plan. Please remove the reference for this statute.

- e. SDCL 45-6B-7(8)(a) and (b): This statute requires Wharf to submit maps showing the expected physical appearance of the affected land after final reclamation and portrayal of the proposed final land use. However, in the Permit Application Reference, Wharf instead refers to the surface owner map and mine plan map. Please revise the references so they refer to the maps required under this statute.
- f. SDCL 45-6B-7(10)(4): In the Permit Application Reference, you refer to Exhibit 23 which is supposed to show proposed reservoirs, tailings ponds, tailings disposal sites, dams, dikes, etc. However, there are no facilities shown on these maps. Please revise the reference so it refers to the correct map. Also, please list the reference for a narrative describing these facilities.
- g. SDCL 45-6B-8: Wharf needs to refer to a narrative of surface mined lands prior to 1971 and a map showing those lands.
- h. SDCL 45-6B-9: Wharf references Section 6.1, which is the introduction to the Reclamation Plan. However, this section does not address reclamation of underground workings.
- i. SDCL 45-6B-10(4): Exhibit 3 does not show the items required under this statute. The maps in Appendix G should also be added as a reference.
- j. SDCL 45-6B-12: The reference should be changed from Section 2.2 to 2.4. Section 2.2 addresses adjacent land use, not surface ownership.
- k. SDCL 45-6B-19: In the Permit Application Reference, you list Section 6.10.1 which discusses the estimated bond calculation as confidential. During DANR and Wharf's April conference call on the draft application, we told Wharf that bond calculations are not confidential. Therefore, remove Section 6.10.1 from the Permit Application Reference.
- l. SDCL 45-6B-20.1 needs to be added to the table which deals with cyanide spill bonds.
- m. SDCL 45-6B-32: Please list each subsection of this statute and the applicable reference in the Permit Application Reference.
- n. SDCL 45-6B-33: Please list each subsection of this statute and the applicable reference in the Permit Application Reference.
- o. SDCL 45-6B-37: The reference for Section 6.7 should be changed to Section 6.7.1. Also, Exhibit 23 does not show the final topography. Finally, Wharf should also refer to the post mine contour cross sections.
- p. SDCL 45-6B-39: Wharf should also reference Appendix Q.
- q. SDCL 45-6B-41: Wharf should reference the entire Sections 3.3 and 3.4 since these entire sections address the hydrologic balance. It should also reference Appendices F and G.
- r. SDCL 45-6B-43: Wharf should refer to the noxious weed control plan in Appendix Q.
- s. SDCL 45-6B-45: There is no Section 6.2.2.2 in the mine permit application, so that reference should be removed. Also, the reference to Chapter 6 needs to be narrowed down to include only the sections that deal with the rangeland post mine land use.
- t. SDCL 45-6B-46: Please list each subsection of this statute and the applicable reference in the Permit Application Reference. In addition, for the Permit Application Reference, you refer to Section 6.5, which only addresses seed mixes and timetables. For this statute, Wharf is required to address the timetable for all aspects of final reclamation, not only seeding. Therefore, please refer to the portion of the reclamation plan that discusses the comprehensive reclamation timetable, and not merely the seeding timetable.
- u. SDCL 45-6-91(1): In the Permit Application Reference, you list Section 6.10.2.5 as addressing treatment of tailings during the postclosure period. However, this

- section only addresses sediment control. Please list the section that addresses treatment of tailings in the postclosure plan.
- v. SDCL 45-6B-91(4): In the Permit Application Reference, you list 6.10.2.4 as addressing procedures for maintaining the final cover, erosion and fugitive dust during the postclosure period. However, this section only addresses vegetative monitoring. This reference should be changed to Section 6.10.2 since the entire section addresses the requirements of this statute.
  - w. SDCL 45-6B-92(1): Please refer to Section 3.12.5 instead of Section 3.7 since that section discusses wildlife critical resources.
  - x. SDCL 45-6B-92(2): Please refer to Section 3.12.6 instead of Section 3.8 since that section discusses aquatic critical resources.
  - y. SDCL 45-6B-92(3): Please refer to Section 3.12.4 instead of Section 3.6 since that section discusses vegetation critical resources.
  - z. SDCL 45-6B-92(4): Please refer to Section 3.12.2 instead of Sections 3.3 and 3.4 since that section discusses water critical resources.
  - aa. SDCL 45-6B-92(5): Please refer to Section 3.12.9 instead of Section 3.3.11 since that section discusses visual critical resources.
  - bb. SDCL 45-6B-92(6): Please refer to Section 3.12.1 instead of Section 3.2 since that section discusses soil critical resources.
  - cc. SDCL 45-6B-92(7): Please refer to Section 3.12.7 instead of Section 3.9 since that section discusses cultural critical resources.
  - dd. SDCL 45-6B-92(8): Please refer to Section 3.12.3 instead of Section 3.5 since that section discusses air quality critical resources.
  - ee. SDCL 45-6B-92(9): Please refer to Section 3.12.8 instead of Section 3.10 since that section discusses noise critical resources.
  - ff. SDCL 45-6B-92(10): Special, Exceptional, Critical, or Unique critical resources needs to be address in Section 3.12.
  - gg. SDCL 45-6B-96: Please change the Information Required from "Additional permits" to "Mine permit history".

Comments for Table 1-1 have been addressed.

Table 1-2:

- a. ARSD 74:29:01:17(1): The CUP boundary is referred in Exhibit 4 in the mine permit application instead of Exhibit 3 as shown in Table 1-1.
- b. ARSD 74:29:02:04(2): In the Permit Application Reference, you refer to Exhibit 23, which is the mine plan map. However, this map does not show pre or post mining contours. Please revise the reference so it refers to the maps required under this statute.
- c. ARSD 74:29:02:04(3): In the Permit Application Reference, Exhibit 6 is not a cross section drawing. Also, Exhibits 32 through 37, which show post mine cross sections, are not included in the Permit Application Reference. Please revise the reference so it refers to the correct cross sections.
- d. ARSD 74:29:02:04(4): In the Permit Application Reference, you refer to Exhibits 2 and 23 which are supposed to show proposed spent ore facilities, waste facilities, ore stockpiles, and other mine spoil. However, there are no facilities shown on these maps. Please revise the reference so it refers to the correct maps.
- e. ARSD 74:29:02:04(5): In the Permit Application Reference, you refer to Section 6.7.1 as addressing stability analysis. However, there is no mention of stability analysis in this section. Please remove or revise the reference.
- f. ARSD 74:29:02:04(6): In the Permit Application Reference, please add Section 5.3.5 which also addresses blasting.

- g. ARSD 74:29:02:05: Section 3.1.2 does not address a timetable for future exploration and should be removed from the references for this regulation.
- h. ARSD 74:29:02:06: Even though the Cultural Report is considered confidential, please add Appendix L to the reference for Historic or Archaeological Significance. For public copies, a note can replace the report in Appendix L stating that the report is confidential.
- i. **BLANK**
- j. ARSD 74:29:02:10: Please list each subsection of this regulation and the applicable reference in the Permit Application Reference.  
**This regulation is addressed in the application; however there appear to be no subsections of this regulation.**
- k. ARSD 74:29:02:11(3): Wharf needs to refer to a map that shows current topography with streams and drainages labeled for baseline. Exhibit 21 shows post mine topography with no streams or drainages labeled. Also, for a surface water inventory map, Wharf should be referring only to Appendix G and not Appendix F. Finally, Wharf should cite the Figure in Appendix G that shows the surface water inventory. Also, Wharf needs to refer to Appendix J for updated spring survey information on Lost Camp.
- l. ARSD 74:29:02:11(4): Wharf should also refer to Exhibit 20 for this regulation.
- m. ARSD 74:29:02:11(5): Please refer to the figure in Appendix F that shows the potentiometric surface.
- n. ARSD 74:29:02:11(9): Section 5.3.5 refers to blasting, not erosion and sediment control.
- o. ARSD 74:29:02:11(13): Since no new pollution control facilities are planned for the Boston Expansion Project, Wharf can refer to previously approved facilities.
- p. ARSD 74:29:05:01: Wharf should also refer to Section 5.5.
- q. ARSD 74:29:05:02: Since this regulation addresses reclamation of mill sites only, Wharf cannot refer to the sections of the application that deal with reclamation of the Boston Expansion area. It can refer to the approved reclamation plan for the Process area covered under other mine permits.
- r. ARSD 74:29:05:03: Wharf should also refer to Section 5.5.
- s. ARSD 74:29:05:04: Wharf should also refer to Section 5.2.
- t. ARSD 74:29:05:05(1-6): Wharf should also refer to Section 5.2 and 5.5.
- u. ARSD 74:29:05:06: Section 6.10.2.5 address erosion and sediment control, not treatment of tailings.
- v. ARSD 74:29:06:02: Please list each subsection of this regulation and the applicable reference in the Permit Application Reference.
- w. ARSD 74:29:07:02(6): Preventive measures to minimize harmful impacts to wildlife should be removed from the Big Game discussion in Section 3.7.5 and placed in its own section. These preventive measures apply to other species besides big game.
- x. ARSD 74:29:07:04(2): Section 5.3.5 addresses blasting, not erosion control. Also, the reference to Section 6.2.1 should be changed to 6.2.1.1 since that section primarily addresses grading.
- y. ARSD 74:29:07:04(3): The reference to Section 6.2.1 should be changed to 6.2.1.1 since that section primarily addresses grading. Also, Table 5.1 addresses a timetable for reclamation in general and not specifically for grading.
- z. ARSD 74:29:07:04(1a-1d), (4), (5), and (7): The reference to Section 6.2.1 should be changed to 6.2.1.1 since that section primarily addresses grading. Also, the "Information Required" title for subsection 7 should be changed to "Blending in landforms", which more accurately addresses the requirements of the subsection.
- aa. ARSD 74:29:07:05: Please change the reference for Section 5.3 to Section 5.3.9 since that section specifically addresses rubble disposal.
- bb. ARSD 74:29:07:06(3): Please include this subsection in the table.

- cc. ARSD 74:29:07:06(1), (2), and (4): Please also include Appendix Q in the Permit Application Reference for these subsections.
- dd. ARSD 74:29:07:07(3) and (6): Please include these subsections in the table.
- ee. ARSD 74:29:07:07(2): This subsection does not address interim reclamation, so it needs a new title in the Information Required column. It only addresses the temporary distribution of topsoil to stabilize lands during periods of temporary cessation and interim reclamation. Also, the references in the Permit Application Reference needs to reflect this.
- ff. ARSD 74:29:07:07(8)(a) and (b): Please include each subsection of this regulation in the table. Also, this regulation only partially addresses the segregation of topsoil and subsoil. The main focus of this regulation is whether topsoil substitutes will be needed. Therefore, the title in the Information Required column needs to reflect this.
- gg. ARSD 74:29:07:08(1-6): Please list each subsection of this regulation and the applicable reference in the Permit Application Reference column.
- hh. ARSD 74:29:07:09(1-8): Please list each subsection of this regulation and the applicable reference in the Permit Application Reference column.
- ii. ARSD 74:29:07:10: Please change the reference for Section 6.2.1 to Section 6.2.1.4 since that section specifically addresses hydrologic balance.
- jj. ARSD 74:29:07:11: Section 5.4 addresses pit backfill, not tailings impoundments. However, it appears that tailings impoundments are addressed in Section 6.2.1.4.
- kk. ARSD 74:29:07:14(1): There are no labels on Exhibits 2 or 23 that show the location of spoil piles. Also, Section 6.2.1 does not address spoil pile locations.
- ll. ARSD 74:29:07:15: Please also reference the weed control plan in Appendix Q in the Permit Application Reference for this regulation.
- mm. ARSD 74:29:07:16: Please clarify the reference for this regulation since it appears it is better addressed in Section 6.7.1 instead of Section 6.2.1.
- nn. ARSD 74:29:07:18: Section 6.1 does not address the competence of the individuals developing the reclamation plan.
- oo. ARSD 74:29:07:20: Please list each subsection of this regulation and the applicable reference in the Permit Application Reference column. Also, there is no Section 6.2.2.1 in the mine permit application.
- pp. ARSD 74:29:07:27: Please include this regulation in the table.
- qq. ARSD 74:29:10: Since the special, exceptional, critical, or unique analysis is a process separate from the mine permit application, and since our special, exceptional, critical, or unique determination is addressed in other portions of the application, this regulation can be removed from the Permit Application Reference

Comments for Table 1-2 have been addressed.

- 21. ARSD 74:29:02:05: In Section 3.1.3, in addition to the exploration activity in the southwest corner of the Boston Expansion area, please address the potential for future exploration after the end of mining in the Boston Pit.

After mining in the Boston Expansion is complete, there are no planned exploration activities in or immediately adjacent to the Boston Expansion due to the close proximity of housing and infrastructure.

- 22. ARSD 74:29:02:11(3): The application indicates a spring survey will be completed in spring 2022 and the results provided. However, the spring survey results are already provided in Appendix F, sub-Appendix J. There needs to be a discussion on the spring survey in the application.

A summary of the spring survey has been added to Section 3.3.4.

23. ARSD 74:29:02:11(6): Please include a discussion on the geochemical characteristics of the eastern portion of the Boston Expansion area.

The geochemistry of ore and waste rock material within the entire Boston Expansion, inclusive of the eastern portion of the expansion, is discussed in Section 3.1.4 and shown on Exhibits 11 through 15. Geochemistry data is provided in Appendix D.

24. ARSD 74:29:05:02: This regulation addresses the reclamation of mill sites only. Therefore, instead of referring to the reclamation plan for the Boston Expansion area, Wharf should address the previously approved reclamation plan for the Process area.

Reference to previously approved plans is mentioned in Section 6.8.3.

25. ARSD 74:29:06:02: Please address each subsection of this regulation.

The subsections for this regulation have been added to Table 1-2 and are addressed in the referenced sections of Chapter 6.0.

26. ARSD 74:29:07:01(3): Please address subsection 3 of this regulation.

The regulation has been added to Table 1-2 and addressed in Section 6.11.

27. ARSD 74:29:07:02(1, 2, 3, 6, 7, 9, and 10): Please address the following subsections of this regulation:

1. In addition to the discussion of concurrent reclamation in Section 6.2.1, please discuss how the Boston Pit will be stripped in small increments to minimize surface disturbance.

ARSD 74:29:07:02(2) is discussed in Sections 5.3.2 and 6.3.

2. In Section 5.3.2, please discuss in detail how many acres will be stripped during each phase of the Boston Pit.

Wharf anticipates three phases of stripping of approximately 16 acres each, weather permitting.

3. Please submit a cross section of the eight-foot berm that will be placed along the southern portion of the Boston Pit.

The proposed berm is of simple geometry, therefore a cross-section does not provide more information than a simple written description. The berm will be approximately eight-foot high and 12 to 14 feet wide at the base, constructed at the angle of repose or no steeper than 3:1. There may be minor variability due to terrain.

6. In Section 3.12.5, please discuss details of mitigation of impacts to bats and aquatic species.

Discussion on mitigation to bats is provided in Section 3.7.3 and is now added to Section 3.12.5. Based on annual aquatic monitoring, ICF concludes that current mining activities at the Wharf Mine are not directly impacting aquatic resources; further there are no identified impacts or needed mitigation of aquatic species as a direct result of the Boston Expansion.

7. Since waste rock and spent ore disposal facilities are not marked on Exhibit 23, please submit a map showing where waste rock and spent ore from the Boston Pit will be placed. Also please submit a map showing the location of the potential Bald Mountain topsoil stockpile. Finally, in the last paragraph on page 82 of Section 6.2.1, please explain in detail how the Juno and Bald Mountain topsoil stockpiles are in close proximity to the Boston Pit.

Waste rock will be placed within the entire full pit extent shown on Exhibit 23, and labeled as backfill on cross-sections in Exhibits 32 through 37. No spent ore will be placed in the Boston Expansion; spent ore derived from the Boston Expansion project will be placed in the American Eagle POP as shown on new Exhibit 38. The statement in Section 6.2.1 was revised for clarity.

9. In Section 6.2, please discuss in detail how the mine design is compatible with other land uses in the Boston Expansion area, such as the Terry Peak ski area and the Lost Camp development.

As discussed in Section 6.2.1, the mine design and location of facilities for the Boston Expansion are compatible with surrounding land uses (ARSD 74:29:07:02(9)). Mining presently occurs to the north of the expansion and there are no new processing facilities associated with the project. The Lost Camp subdivision occurs just south of the expansion and Terry Peak ski area is located to the southeast. The expansion mine plan was designed to include a buffer between Wharf's property boundary and active mining operations as well as a berm so that once the upper mining bench is complete, visual and noise impacts to Lost Camp subdivision will be reduced. The expansion will have little to no impact, including visual impact, to recreation opportunities including the Terry Peak ski area.

28. ARSD 74:29:07:14(1): In Section 6.2.1.5, please address whether waste rock will block intermittent or ephemeral streams. Also, spoil piles are not labeled on Exhibits 2 and 23.

There are no intermittent or ephemeral streams within the Boston Expansion. Waste rock from the Boston Expansion will not block streams. Waste rock will be placed within the entire full pit extent shown on Exhibit 23, and labeled as backfill on cross-sections in Exhibits 32 through 37.

29. ARSD 74:29:07:18: Please discuss whether the individuals developing the reclamation plan have experience in developing reclamation plans.

Comment addressed.

30. ARSD 74:29:08:01 and 02: Instead of referring to the final reclamation plan, Wharf needs to add a section in the Reclamation Plan that addresses concurrent reclamation. We realize that some elements of the concurrent and final reclamation plans will be the same, but Wharf needs to separate reclamation activities conducted during mining from those activities that will be conducted after mining is completed in the Boston Pit, which constitutes final reclamation.

Also, in Section 6.3, please change all references from "Interim Revegetation" to "Interim Reclamation". Wharf Resources is required under ARSD 74:29:08 to submit an Interim Reclamation Plan, not an Interim Revegetation Plan. Interim Reclamation is also defined in the regulations as reclamation performed during a mining operation to stabilize affected land **by regrading** as well as revegetation. Also, please remove the reference to Wharf conducting interim reclamation under its EXNI's in the Boston Expansion area. This reclamation is considered final reclamation under the EXNI's only and is not related in any way to the mine permit application. Wharf can also modify the statement to briefly summarize the final reclamation work conducted under the EXNI's.

New Section 6.3 has been added to specifically address concurrent reclamation. The section heading and references in that section have all been changed to "interim reclamation" as requested. The statement about the EXNI reclamation has been deleted.

Wharf Resources should also be aware of the following general comments and questions concerning the permit application:

1. As discussed during earlier meetings, Wharf Resources does not need to include the Large Scale Mining/Milling Permit Operating and Reclamation Plan Guidelines with the mine permit application. Even though they are attached to the large scale mine permit application form, the guidelines are only included to help you complete the mine permit application and do not need to be returned to our office.

Comment acknowledged.

2. ARSD 74:29:06:01: The department concurs with Wharf Resources, who is also the surface owner, that rangeland is an appropriate post mine land use.

Comment acknowledged.

3. ARSD 74:29:01:07. Regarding the determination of procedural completeness, within 30 days after submission of an application, the department shall notify the applicant in writing whether the application is procedurally complete. An application is considered filed on the final day of the initial 30-day review period if it is procedurally complete; if the application is procedurally incomplete, the department shall identify in the notification the items required to complete the application. The department shall determine the adequacy of the applicant's response to the notice of deficiencies and shall notify the applicant in writing of the adequacy of the response within 7 days after receipt of the response. If the response is adequate, the application is considered filed. If the response is inadequate, the applicant may do one of the following:

- a. Submit additional information necessary to complete the application;
- b. Request in writing that the application be considered filed; or
- c. Withdraw the application.

Comment acknowledged.



4. ARSD 74:29:01:10. The department will begin drafting a summary document for the permit application after we received the final copy of the mine permit application. We will provide the summary document to Wharf Resources for review and comment at a later date.

Comment acknowledged.

We also have the following technical comments:

1. Section 2.0, Property Description, page 12: In the last sentence of this section, please change, "The permitted-to-affected land ratio is 1:1.03" to "The permit boundary to permitted affected acreage ratio is 1:1.03", which more clearly reflects the ratio.

Comment addressed.

2. Section 2.3, County Conditional Use Permit Boundary/Zoning, page 13: Exhibit 4 does not appear to show the Lawrence County CUP boundary. If it is coincident with the proposed mine permit boundary, it is not mentioned in the map legend. Also, Wharf should refer to the copy of the CUP in Appendix A. Wharf should also include a copy of the CUP conditions in Appendix A.

The CUP boundary is coincident with the proposed mine permit boundary; the legend in Exhibit 4 has been edited to note the CUP boundary. The copy of the CUP is referenced in Section 2.3. The Planning and Zoning staff report, which includes the CUP permit conditions, has been added to Appendix A.

3. Section 2.5, Determination of Special, Exceptional, Critical, or Unique Lands: At the end of this section is a bulleted list of items providing a summary of the findings of this Request for Determination. In the fourth bullet Wharf should separate bats into a separate bullet from the raptors.

Comment addressed.

4. Section 3.1.4, Geochemical Characterization of Ore and Waste Rock and Appendix B: In the second paragraph of this section Wharf reports new labs performed ABA, nitrate and humidity cell tests for the Boston expansion area. However, in Appendix D, only the Standard Operating Procedures for the historic tests were provided. Please also include the testing and standard Operating Procedures for the new labs.

Additional standard operating procedures and information from new labs used for geochemical testing have been added to Appendix D Geochemistry.

5. Section 3.1.4.1, Acid-Base Accounting Test Results, page 18: In the third paragraph, Wharf only refers to acid neutralizing potentials above 3:1. It should also discuss ratios that are less than 3:1.

The classification text about AGP potential, including the definition of ratios less than 3:1, was moved from Section 3.1.4.7 to Section 3.1.4.1 to coincide with the discussion of the California Standard Ratio.

6. Section 3.1.4.1.2, Upper and Intermediate Deadwood: Wharf states, "However, this unit, in all combinations of ore versus waste and in pit versus outside pit, has a low acid generating potential and a high neutralization potential." How was this determined? Was consideration given to just ore

as it is separated from wastes? Is there any acid generating potential in these materials? If yes, is it primarily in ore or waste rock? What would be the primary blending source for any potentially acid generating materials? The statement provided is very general and does not provide any technical supporting information that may explain how this determination was made.

This quote is also made in Sections 3.1.4.1.1, 3.1.4.1.3, and 3.1.4.1.4. Please provide better clarification in all sections.

The statement about the overall unit having a low acid generating potential is based on review of acid base accounting tests that were performed for all samples within a rock unit (inclusive of both waste rock and ore). As discussed in Section 3.1.4.1, the interpretation of acid-generating potential / neutralization potential is based on the California standard ratio. Samples with a NNP less than 20 and ANP:AGP less than 3:1 were classified as moderate to high AGP. The statements in the large scale mine permit application as supported by the raw data in Appendix D. A summary table of ABA results has been

ABA samples were obtained on a 100-ft spacing grid and any marginal or negative net neutralizing potential samples are scrutinized by additional testing of surrounding materials. For the entire Boston Expansion, a small number of acid generating potential samples occur, located primarily in ore and small narrow mineralized zones. Given the small, localized zones of potentially acid generating material, adjacent material would be suitable for blending based upon the baseline geochemical grid.

7. Section 3.1.4.1.2, Upper and Intermediate Deadwood: The last paragraph in this section indicates the use of the California Standard Ratio which is described in Section 3.1.4.1 and then also provides a statement about the Net Neutralizing Potential (NNP) of the material, which isn't described in any way until Section 3.1.4.7--this is confusing. It would be less confusing if you provide a more detailed description of the NNP of materials near the start of the section with the first discussion on the California Standard Ratio to prevent confusion.

The classification text about AGP potential was moved from Section 3.1.4.7 to Section 3.1.4.1 to coincide with the discussion of the California Standard Ratio.

8. Section 3.1.4.3, Meteoric Water Mobility Tests: For clarification, this is the only section noted that refers to sub-ore grade rock. Is this waste rock or is this rock that may be stockpiled for possible future processing as ore? How is this material being accounted for in the assessment for mine tons of material?

In this context, sub-ore grade rock is waste rock; the term was changed to waste rock for clarity.

9. Section 3.1.4.4, Humidity Cell Test Results: Only nine of the ten reported test results are discussed in this section. Please include a full discussion of all test results.

The tenth humidity cell test is located outside of the proposed Boston Expansion boundary, though additional discussion of those results has been added to Section 3.1.4.4.

10. Section 3.1.4.6, Conclusions and Additional Testing: Wharf states, "In addition, the ARD Management Plan at Wharf Resources is a proactive procedure/system that delineates the mining bodies in advance of mining, and this process is successful and has not shown any ARD potential in the other rock units to be mined." While the department agrees that the current ARD Management Plan has been successful, stating that there has not been mining of material with ARD potential is

incorrect. Wharf reports all possible ARD generating materials and how the ARD management plan is followed to the department on a quarterly basis and has reported several instances of potentially acid generating material in three of the four quarters in 2021.

The sentence has been edited to remove the phrase "and has not shown any ARD potential in the other rock units to be mined".

11. Section 3.1.4.7, Mitigation Plan for Acid-Generating Potential Rock: This section seems to include the existing ARD Management Plan. However, in the mine permit application the description seems very convoluted and verbose compared to the existing plan, and as a result seems to change portions of the existing plan or confuses what actions occur. Consider simplifying the description of the plan, and including the existing ARD Management Plan as reference in Appendix D.

The existing ARD management plan has been added to Appendix D.

12. Section 3.1.4.7, Mitigation Plan for Acid-Generating Potential Rock: Wharf states, "In addition, the mapping, observation, geochemical testing, and the known geology from past mining in adjacent pits of Trojan, Deep Portland, Foley, Harmony, and Liberty Pits have realized no significant ARD zones" and, "In the almost 40 years of mining, the adjacent Trojan, Foley, and Portland Pits at Wharf Resources and the Liberty and Harmony Pits at Golden Reward have not had any ARD issues." The Harmony Pit at Golden Reward is a source of materials that produced acid. In 1997, Golden Reward was forced to pull back material from rock depositories that were highly acid generating and place that material in the bottom of West Liberty pit, encapsulating those materials in a plastic liner. The pit itself was also capped with a plastic liner, however, persistent water quality concerns at SM-01A and then SM-01B resulted in Wharf Resources installing a new cap in 2014-2015 on the West Liberty Pit to help further mitigate acid rock generation issues from this pit. Therefore, the above quoted statements in the mine permit application are incorrect.

The incorrect statements have been addressed by removing discussion of the Harmony and Liberty Pits at Golden Reward. The Boston Expansion does not contain nor is it immediately adjacent to Golden Reward.

13. Section 3.1.4.7, Mitigation Plan for Acid-Generating Potential Rock: The paragraph starting with "The summary of the geochemical analysis..." on page 25 of the application appears to be misplaced. There is a detailed description paragraph above discussing sulfur content impacts to evaluation of potential ARD materials, and the paragraph afterwards provides a description of ABA analysis. This generic paragraph does not fit at this location.

The noted paragraph has been removed. Current quarterly reported is completed by averaging values to determine blending volumes so this paragraph is not necessary.

14. Section 3.1.4.7.1: The Portland Ridgeline Base Amendment material tonnages noted in Table 3-3K are significantly greater than those that had been reported previously in the Flossie geochemistry analysis provided in 2020 for the same material. Please confirm the amount of base amendment materials noted in this table. Also, there is no statement of the blend ratio for ore in this discussion.

Table 3-3 shows both the tonnage available and the tonnage needed to blend out the potential special handling. The base amendment data in Table 3-3 is provided to demonstrate blending material that will be available so that if there is more special handling material identified, Wharf can take remedy it. The base amendment material is selected by the mining sequence in the mine plan.

The data presented in the 2020 plan addressed potential special handling zones in Flossie and base amendment as both were available in that mine plan. The 2020 numbers for blending are what is needed to meet the mixing requirement. However, the 2020 data from the Flossie plan is irrelevant to the Boston Expansion as that material has been mined out and reported on in the quarterly reports to SD DANR. Therefore, the data provided in Table 3-3 is correct and no changes to the table were made.

A statement and reference to the blend ratio has been added to Section 3.1.4.7.2, General Blending of Mined Material.

15. Section 3.1.4.7.4, Ore Management Plan: There is no discussion or referral to previous discussion on the blending calculations or blending requirements that are specific to ore as part of the Acid Mitigation Plan. Please include this here.

The blending ratio for ore of 4:1 and a reference to the 2002 ARD plan has been added to this section.

16. Section 3.1.4.7.6: The first sentence of this section is incomplete. Also, there is no timeline provided for the placement of amendment material on pit and highwall locations with potentially acid generating material on it.

Comment addressed.

17. Section 3.2.2: In the first paragraph of this section, it states that Grizzly very gravelly silt loam covers 9% of the total area and has 0% of the topsoil volume. Three paragraphs later the description of this soil indicates it is a fair source of topsoil to two inches in depth. These two statements are contradictory. Please clarify.

The Grizzly very gravelly silt loam map unit is a fair source of topsoil to 2 inches based on average sample locations within the 2010 expansion area, though based on sample locations falling within the smaller Boston Expansion area the Grizzly series has a topsoil salvage depth of 0 inches. Topsoil salvage depth for the other two series within the Boston Expansion Area was also calculated in this same manner. Section 3.2.2 has been edited for clarity.

18. Section 3.3.1, Groundwater Occurrence: In the second paragraph of this section the well map is indicated to be present in Appendix F. Please provide better clarification and state the well map is Exhibit 20 of Appendix F.

Comment addressed.

19. Section 3.3.1, Groundwater Occurrence: Wharf states the groundwater elevation based on the potentiometric map may range from 5,800 feet to 6,250 feet. The mine plan also indicates the deepest pit floor will be at an elevation of 6,260 feet. This is a potential of only 10 feet of difference between the groundwater elevation and the pit bottom. This section would benefit from a better discussion of differences between pit bottom elevation and groundwater elevation for the two primary expansion areas.

The following has been added to Section 3.3.1. "The regional potentiometric map is approximate and may vary, though no exploration borings in the area have encountered the groundwater table."

20. Section 3.4.3 and 3.4.4: These two sections seem to negate potential impacts that water in pits may have on both ground water and surface water. Water that comes into contact with waste rock and spent ore will pool into backfilled pits and seep out into surrounding aquifers. Water that comes into contact with waste rock and spent ore also has the potential to enter into surface waters through springs. Please expand the discussion to address this potential.

No spent ore will be disposed of in the Boston Expansion. The potential for water contacting waste rock to seep into aquifers has been noted in Section 3.3.5 and a callout to Appendix F, the groundwater characterization study, have been added. The potential for water contacting waste rock to enter surface water through springs has been added to Section 3.4.3.

21. Section 3.4.3: Wharf states, "...the surface-water standard of 50 parts per million (ppm) nitrates for a cold-water fishery will not be exceeded as a result of this project." Please note that the surface water quality standards for a cold-water fishery are more extensive than simply nitrates and are outlined in ARSD 74:51:01:32, 45, 46, and 55 as well as Wharf's NPDES permits.

The additional applicable administrative rules listed have been added to Section 3.4.3. The discussion about nitrate was modified to state "the surface-water standards for biological oxygen demand (BOD), ammonia, chlorides, dissolved oxygen, hydrogen sulfide, pH, total suspended solids (TSS), temperature, or toxic pollutants...".

22. Section 3.5.5, Meteorological Stations and 3.5.6, Proposed Air-Quality and Meteorological Monitoring Program: The last paragraph of Section 3.5.5 seems to discuss collection of meteorologic data, which should be discussed in Section 3.5.6 as per title of the section.

As per complete comment 16 above, the meteorological monitoring program discussion has been relocated under hydrologic monitoring instead of air quality monitoring (ARSD 74:29:02:11).

23. Section 3.5.7, Air Quality – Impacts to Terry Peak, Barefoot Condominium and Lost Camp Areas: This section should address dust control on haul roads in addition to blasting.

The following sentence has been added to Section 3.5.7: "Haul roads are sprayed with water and a chemical treatment (magnesium chloride) to maintain acceptable dust levels; the normal road-watering season runs from May through October."

24. Section 3.12.1, Soils, page 59: In the last sentence of this section, Wharf states fertilizer is not recommended because native species typically grow without amendments in soils around the Wharf Mine. Even though the species may grow, the department has expressed concerns over sparse vegetative growth in some reclaimed areas—this includes sparse vegetative growth not attributed to drought. In the past, Wharf did use fertilizer as areas were seeded, and it appeared to help first year growth become established. Instead of basing fertilizer requirements on visual vegetation observations only, Wharf needs to analyze stockpiled topsoil to determine current soil nutrient levels and fertilizing requirements.

Wharf commits to sampling stockpiled topsoil associated with the Boston Expansion to determine soil nutrient levels prior to reclamation. The following sentence has been added to Section 3.12.1. "Fertilizer requirements will be based on analysis of stockpiled topsoil to determine soil nutrient levels and appropriate fertilization requirements."

25. Section 3.12.6: As noted in above in the comment for Section 3.4.3, this section again only comments on nitrate concentrations being maintained as part of ARSD 74:51:03:01 for cold water fisheries. However, surface water quality standards for cold water fisheries are defined in ARSD 74:51:01:32, 45, 46, and 55 as well as in Wharf's NPDES permits and address more potential pollutants than nitrates.

The additional applicable administrative rules have been added to Section 3.12.6.

26. Section 4.2, Fiscal Trends Affecting Lawrence County: The first section of this paragraph is worded improperly. Wharf states, "Fiscal impacts of Wharf Mine operations include the community of Lead, Lawrence County, and other communities where Wharf employees reside." These communities may be subject to fiscal impacts from Wharf's mining operation but are not fiscal impacts of the mining operation.

Comment addressed.

27. Section 5.2, General Mine Planning and Design, page 70: In the last paragraph of this section, Wharf should also state that existing facilities and ponds covered under existing mine permits will be used to process ore from the Boston Pit.

Comment addressed.

28. Section 5.3.3, Soil Salvage Handling Plan: The last two paragraphs appear to read more as a plan for vegetative success than soil handling. Please provide some further explanation or better clarity on why these two paragraphs are in this section.

The discussion in Section 5.3.3 focusing on an example of vegetative success has been moved to Section 6.2.1.3, Revegetation.

29. Section 5.3.5, Blasting and Vibration: Wharf states, "Wharf will use blasting agents and techniques that are standard for the mining industry and are currently in practice at Wharf Mine." Please clarify.

The sentence has been rewritten.

30. Section 5.3.5, Blasting and Vibration: Wharf states, "Wharf will use similar blast procedures within the Boston Expansion and expects similar noise and vibration levels at adjacent properties." Similar to what?

The statement has been clarified to note that blast procedures at the expansion will be similar to present blast procedures as well as that noise and vibration levels will be similar.

31. Section 5.3.6, Water Management and Erosion Control, page 74: In the first paragraph of this section, Wharf states no permanent erosion control structures are planned because all precipitation will drain into the pit and only temporary sediment control structures such as hay bales, wattles, and silt fencing will be used. This contradicts Section 3.4.4, which states drainage to the pit bottom will be minimized using diversion methods such as berms, water bars, or drainages. Also, Section 6.2.1.4 states that unchanneled surface water will be diverted away from the operation when possible. This paragraph needs to be revised so that the erosion control discussion reflects that covered under Sections 3.4.4. and 6.2.1.4.

During active mining operations, the majority of precipitation falling on the Boston Expansion would drain into the pit and only temporary sediment control structures are planned. The statements in Sections 3.4.4 and 6.2.1.4 have been edited for clarity.

Also, in the last paragraph of this section, Wharf states areas that are conducive to planting will be prepared and seeded. Based on our inspections of the Boston Expansion area and a review of the Vegetative Survey, all disturbed areas affected under the new mine permit should be conducive to planting and should be prepared for seeding. This statement needs to be modified to reflect this.

The sentence has been reworded and removes the statement of "conducive to planting".

32. Section 5.4, Pit Backfilling, pages 76 through 78: If the Boston Pit will only be backfilled with waste rock, the spent ore discussion in this section should be removed and placed into a separate section to avoid confusion that spent ore will also be used as backfill material. Also, a map should be added showing the POP zones where spent ore will be disposed.

The text on spent ore has been removed from Section 5.4 and moved to new Section 5.8, Spent Ore Disposal. Spent ore from the Boston Expansion area will be placed within the southern portion of the American Eagle POP. The location will roughly coincide with subpit/zone 32 in the last groundwater model update [Hocking and Meuzelaar, 2021].

33. Section 6.2.1.1, Grading and Erosion Control Measures, page 82: In the first sentence of this section, Wharf states that grading and backfilling will be completed to achieve visually and functionally compatible contours when technically and economically feasible. After reviewing the Reclamation Plan, it appears all the proposed grading and erosion control plan is technically and economically feasible. Therefore, the statement "technically and economically feasible" should be removed from this sentence.

Comment addressed.

34. Section 6.2.1.7, Final Reclamation and Post-Mining Land Use, page 84: In the second sentence of the second paragraph in this section, Wharf refers to a Section 6.2.2.1. There is no Section 6.2.2.1 in the mine permit application. Also, if the Boston Expansion area is being reclaimed to rangeland only, why is there a discussion on recreational opportunities in the third paragraph of this section?

The section callout has been corrected to Section 6.2.2 and discussion on recreational opportunities has been deleted.

35. Section 6.2.2, Specific Postmining Land-use Types: The term ADB is used in this section but there is no corresponding description for this term until several pages later. Please include that in this section to prevent confusion.

The acronym ADB has been spelled out in Section 6.2.2.

36. Section 6.3, Interim Revegetation, page 86: In the first paragraph of this section, Wharf states that interim reclamation methods will entail direct seeding areas without using supplemental topsoil which has proven to be effective at the Wharf Mine. Please list the areas where this has been effective as the department was unaware that Wharf was using this practice on interim reclaimed areas.

Also, in the same paragraph, Wharf states that the past two years with low precipitation has limited vegetation response on interim reclaimed areas. The department is aware of drought impacts on some recent final reclamation, but not interim reclamation. Which interim reclaimed areas have been impacted by drought conditions?

Examples of interim reclamation methods have been added to Section 6.3 and include areas such as temporary exploration trails, portions of utility corridors, etc. The statement about drought impacts on interim reclamation has been removed from this section as it is more applicable to final reclamation.

37. Section 6.5.3, Woody Species Revegetation, pages 88 and 89: Please submit a map showing potential tree and shrub clump locations. Also, to differentiate between planted trees and shrubs and native tree and shrub transplants, please refer to the native transplants as tree pods instead of tree clumps.

Wharf voluntarily plans to transplant some trees and shrubs sourced from the Boston expansion area to provide visual diversity. Potential tree and shrub locations have not yet been determined but will be determined based on timing of the grubbing activity and status of nearby disturbance suitable at that time, therefore no map of potential locations has been generated. The term "tree clumps" has been revised to "tree pods".

38. Section 6.7.1, Pit Bench and Backfill Reclamation, page 91: In the last paragraph of this section, Wharf refers to the broad flattened or gently rolling nature of the pit bottom. After reviewing the post mine cross sections, it appears there will not be a pit bottom after backfilling is complete. Please clarify if a pit bottom will remain after backfilling is complete.

The text about "pit bottom" was removed as there will be no pit bottom after backfilling is complete.

39. Section 6.9.1, Vegetation: In the last paragraph of this section, Wharf states that average versus above average versus below average precipitation will be determined based on recorded precipitation between 1948 and 2020 from the NOAA weather station in Lead. Please note that it will be a number of years before forage production will be able to be determined for the reclaimed Boston Expansion area. The precipitation patterns in the years immediately before the forage production is determined should be the data used instead of average precipitation from 1948 to 2020. Wharf should consider revising this sentence to reflect how Cedar Creek used precipitation to determine dry year-wet year-normal year forage production, or eliminate the sentence.

As suggested, the sentence about precipitation has been deleted.

40. Section 6.9.3, Final Reclamation Review, pages 92 and 93: We assume the discussion in this section is related to the reclamation of the entire mine site. However, please separate the Boston Expansion area from the remaining mine site since this application is for that area.

Section 6.9.3 has been edited to clarify this discussion is associated only with the Boston Expansion.

41. Section 7.0 Proposed Technical Revision Permit Conditions: The numbering for the technical revision list should start with 1 rather than 10. Also, please verify whether this list of technical revisions is just for the Boston Expansion area or the entire mine site. There are a number of technical revisions from the current list (4, 7, 9, 13, 14, 16, 17, 21, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 46, 47, 48, and 49) that are not included on the list in Section 7.0. Please note that if these



are removed from the technical revision list, any modification for these items would require a permit amendment.

The numbering of proposed technical revisions in Section 7.0 has been fixed. The revised technical revision list is intended to apply to the entire mine site, including the Boston Expansion.

Also, please note that permit amendments are required for minor modifications to the terms and conditions of the operating and reclamation plans. Minor modifications are defined as a change in the operating or reclamation plan which does not increase the potential for adverse environmental effects. Under ARSD 74:20:03:16, the Board of Minerals and Environment may authorize the department to approve proposed technical revisions without the requirements of a permit amendment. As a result, there are limits to Wharf's statement regarding the scope of a proposed change that is of a substantive nature beyond basic operational adjustments. The requirements in regulation that a technical revision must be submitted for a minor modification prevails over what Wharf views as a substantive change. Therefore, the following are some of the changes that need to be made to some of the technical revision categories proposed by Wharf:

- Modifying reclamation seed mixes or rates. The phrase "that are beyond minor adjustments based on observed success, species availability, etc." needs to be removed. We view any change to a seed mix as a minor modification, and the Lawrence County NRCS needs to be involved in approving any changes. Species availability issues can be addressed to a certain extent without a technical revision, but it needs to be limited to substituting a variety of a species and not substituting one species for an entirely different species.
- Remove "substantially" from the phrase "Adding or modifying ancillary facilities..". Again, any minor and not substantial modifications require a technical revision.
- Modifying topsoil stripping plans and storage areas. Remove "slash piles" since they should be addressed under a separate technical revision category. Also, remove "if new disturbance will be created by the modification." Again, the relocation of topsoil stockpiles is considered a minor modification, and it does not matter whether stockpiles are associated with new disturbance. We need to know the location of topsoil stockpiles since it has bonding and reclamation implications.

The suggested changes to Section 7.0 have been incorporated.

42. Exhibit 2, Current Topography: Please label major facilities such as current pits and waste rock and spent ore depositories on this exhibit. There are also no labels defining contour elevations. Please include these on the map.

Comment addressed.

43. Exhibit 3, Facilities: This exhibit is referenced under Table 1-1 for SDCL 45-6B-8. However, the area denoted as Historic Pits Backfill are areas that have been disturbed by Wharf as part of mining conducted under Large Scale Mine Permits 356, 434, and 435. This is activity that has occurred after 1971. SDCL 45-6B-8 refers to any surface disturbance created by mining from prior to 1971. Please correct the map and reference.

The callout for Exhibit 3 has been removed from Table 1-1 for SDCL 45-6B-8. There are no pre-1971 surface mining features in the Boston Expansion. No changes to Exhibit 3 existing facilities appear necessary.

44. Exhibit 3, Facilities: Please shade in the portion of the Boston Expansion that is within the current mine permit boundary and indicate the acreage for the portions inside the current and new permit boundaries in the map legend.

Exhibit 3 has been revised to clarify the additional disturbance acreage within the current permit boundary but that is part of the Boston Expansion. Permit and disturbance acreages are described in the application report.

45. Exhibit 5, Boston Area Historical Mine Workings: This Exhibit is referred to on Table 1-1 for SDCL 45-6B-8. However, this map only shows underground mine workings applicable to SDCL 45-6B-9.

Wharf staff are unaware of historical, pre-1971 surface mining operations within the Boston Expansion area or nearby areas. Three underground mining collapse features present within the Boston Expansion area were filled in September 2022. Table 1-1 will be revised to reflect SDCL 45-6B-8 is not applicable.

46. Exhibit 6-10: The geologic map shown in Exhibit 6 does not match the geology noted in Exhibits 7, 8, and 10. Please correct.

The geology presented in Exhibit 6 is the general regional geology of the pre-mined surface from Redden et. al, 2000. The cross sections in Exhibits 7 through 10 are based upon mined out and back filled areas with subsurface interpretation based on drilling. Though the geology is very similar, it is not exact because of the difference in data sources.

47. Exhibit 16: The lines indicated within the Legend for this map are barely visible on the paper copy provided, and not at all visible in the digital version. In addition, the same color lines were utilized for the special handling areas denoted on the map, which creates confusion. Please correct. Also, a geochemical cross section showing the eastern expansion area needs to be included in the analysis.

Exhibit 16 has been revised for enhanced clarity.

48. Exhibits 17-18: These cross sections need to show proposed pit boundaries.

The designed pit boundaries were previously shown on these exhibits, however the symbol thickness has been increased to enhance visibility. Scales were also added.

49. Exhibit 19: The drill trace line noted in the legend is not on the cross-section. Please correct.

Comment addressed.

50. Exhibit 21, Watersheds and Flow Lines Post-Mining Contours: Please identify the numbered areas on the map in the map legend or explain the numbered areas elsewhere in the application. Also, the shading of the Boston Expansion Area over the shading of the watershed areas covers any other features noted in this area. Please modify the colors in this map to more clearly separate watershed areas from the permit boundary area, and to allow better visibility of information within the proposed Boston Expansion area.

Comment addressed.

51. Exhibit 23: There are only five cross-sections noted on this map. Please also include cross-section F-F' on this map, and mark clearly that these cross sections are referred to through Exhibits 32-37. Currently, it appears as though Wharf may have neglected to supply the necessary cross sections for the proposed mine plan and only provided the cross sections for the post mine land use.

The exhibit has been edited to include all cross-sections and a reference to Exhibits 32-37.

52. Exhibit 24: Wharf currently has a technical revision submitted to the department which may affect the accuracy of this map. This map may need to be modified in the future based on the actions on the technical revision.

Comment noted.

53. Exhibit 29: Please include a proposed design cross-section for the berm. Also, it is noted that there is a "low spot" in the berm on the southwest length of the berm. Please include a description of a culvert or other drainage design to promote storm water runoff flowing off site so it does not pool behind the berm and potentially cause berm instability.

See response to completeness comment 27. The proposed berm is of simple geometry, therefore a cross-section does not provide more information than a simple written description. The berm will be approximately eight-foot high and 12 to 14 feet wide at the base, constructed at the angle of repose or no steeper than 3:1. There may be minor variability due to terrain, though no water is expected to pool behind the berm.

54. Exhibit 31, Post Mine Land Use: To avoid confusion, please provide a map showing only the post mine contours and land use in the Boston Expansion area in addition to Exhibit 31, which shows all post mine contours and land uses at the Wharf Mine.

A zoomed in view of the Boston Expansion has been prepared as Exhibit 31B.

55. Geology presented in Exhibits 7-10 do not appear to completely match the geology shown in Exhibits 32-37. It appears from the maps that these cross-sections should coincide with each other. Please compare and make corrections as necessary.

Geology cross sections on Exhibits 8 and 9 have been revised. The geology on the post-mine cross sections on Exhibits 32, 33, and 35 have also been revised.

56. Appendix C-4: Barefoot Resort Association is misspelled.

Comment addressed.

57. Appendix K: The 2021 Aquatic Survey was submitted to the department on April 14, 2022. Please explain why the 2020 Aquatic Survey is provided in the mine permit application rather than the 2021 report.

The newer 2021 aquatic survey report has replaced the older version in Appendix K. The 2020 aquatic survey report was originally included as that was the most recent version at the time the draft large scale mine was created.