Stillwater Mining Company dba as Sibanye-Stillwater

East Boulder Mine:
PO Box 1227
Big Timber • Montana • 59011

Tel +1 406-932-8259
Mobile + 1 406-321-0313

June 15, 2020

Mary Erickson, Forest Supervisor
Custer Gallatin National Forest
PO Box 130
Bozeman, MT 59771

Dan Walsh, Chief
DEQ, Hard Rock Mining Bureau
PO Box 200901
Helena, MT 59620-09014

RE: East Boulder Mine Stage 6 Tailings Storage Facility Expansion – Draft EA

Stillwater Mining Company (SMC) has reviewed the Draft Environmental Assessment (EA) for the proposed East Boulder Mine Stage 6 Tailings Storage Facility Expansion and offers comments in the pages which follow.

In addition to enclosed comments on the EA, SMC would like the Agencies to consider current water management plans/modifications that may have a bearing on certain water management sections of the EA.

1. In 2020, SMC has proposed a minor revision (MR20-001; pending Agency approval) to Operating Permit #00149 for expansion of the site water management plan to include deep well injection as a water disposal alternative. The addition of the Boe Ranch Injection well would have an effect on water management during operations and closure. In order of preferred utilization, percolation at the minesite, disposal through the Boe Ranch Injection Well, Boe Ranch LAD, and direct discharge to the East Boulder River will remain alternatives for treated water discharge/disposal. The Boe Ranch Injection Well is designed with a minimum of 500 gpm capacity for water disposal.

2. The East Boulder embankment underdrain system has operated very effectively as a capture system for nitrogen migrating through the waste rock in the Stage 3/4/5 TSF. During active placement of waste rock on the embankment, nitrogen loads captured through this underdrain have ranged from 60 lbs/day to 100 lbs/day as an annual average since 2015. SMC intends to study the predicted long-term water quality characteristics of the embankment underdrain after waste rock placement has ceased for the Stage 6 TSF embankment. It is likely that these studies will demonstrate

the need to continue treatment (active or passive) of the embankment underdrain water beyond the 18 months estimated in the current reclamation bond. A similar study has been initiated at the East Waste Rock storage area at the Stillwater Mine and the Benbow waste rock storage area active monitoring will both contribute valuable information to the refinement of predicting long-term water quality trends for waste rock underdrain systems.

SMC suggests the Agencies consider language at appropriate locations in the EA to describe water management associated with 1) the Boe Ranch injection well and 2) ongoing water quality studies for the embankment underdrain. SMC also recommends that annual and 5-year bond calculations be updated to reflect ongoing studies as more information becomes available.

East Boulder Mine Stage 6 Tailings Storage Facility Expansion Project
Draft Environmental Assessment, May 2020
Stillwater Mining Company Comments:

Section 1.1, Paragraph 3
'The current authorized mine permit boundary for the mill site and TSF (Project area) encompasses approximately 396.58 acres.'
Comment #1:
East Boulder Mine records, as reported on the 2019 Annual Operating Permit Report show an operating permit area of 396.99 acres.

Section 1.4, Page 1-6
'For every 100 tons of ore fed to the mill, the mine generates 99 tons of tailings.'
Comment #2:
SMC recommends changing the '99' to '98' to more accurately reflect current mill recovery.

Section 2.1.2.1, Page 2-6
'Stage 2 was constructed in 2006. It consisted of a second storage cell (Cell 2) adjacent to Cell 1.'
Comment #3:
A more accurate statement would be 'Stage 2 construction was completed in 2006', as Stage 2 construction occurred over a 6-year period.

Section 2.1.2.1, Page 2-6
'Stage 3 was constructed in 2015 and included expanding the confining embankments around Cells 1 and 2 to an elevation of 6,305 feet.'
Comment #4:
A more accurate statement would be 'Stage 3 construction was completed in 2015', as Stage 3 construction occurred over multiple years.

Section 2.1.4.1, Page 2-7
'These piezometers are used to monitor groundwater levels, pressure, and stability.'

Comment #5:
A more accurate statement would be 'These piezometers are used to measure pore pressure of interstitial tailings water within the lined TSF basin.'

Section 2.1.6, Page 2-8
'Surface soil (topsoil approximately 0 to 6 inches) and subsoil (approximately 6 to 22 inches) are stockpiled separately. Surface Soil Storage Area A1 consists of topsoil, and Surface Soil Storage Areas A2 and A3 are subsoil stockpiles; all three are west of the TSF. Surface Soil Storage Area B is topsoil and is north of the TSF. Surface Soil Storage Area C is topsoil and is at the plant site. Soil borrow areas are west of the TSF (Figure 2.1-1).'
Comment #6:
SMC suggests removing the distinction between topsoil and subsoil from this section and subsequent sections that make the same distinction within the EA. During the 2016 CORP revision, the SMC and the Agencies agreed to remove the distinction between topsoil and subsoil, resulting in a required replacement during reclamation of a specified soil depth. Section 2.6.3 of the East Boulder Consolidated Operations and Reclamation Plan (CORP) states, *"Salvage and stockpile of soils within the East Boulder Permit area is described in the Reclamation Plan in Section 4.4.1. In general, soil will be salvaged from all disturbed areas and will provide for a redistribution depth of approximately 28 inches. Redistribution on areas composed of glacial till and suitable subsoil will result in 6 inches of soil replacement. The TSF and any areas constructed from waste rock materials will receive 28 inches of soil cover."*

Section 2.2.1, Table 2.2-1, Page 2-17
'Table 2.2-1 – Proposed Project Disturbance'
Comment #7:
The acreages presented in this table are similar, however, not in precise agreement with the acreages calculated from SMC's disturbance drawings. SMC recommends that ERO meet with SMC to review the basis of these acreages. The following table demonstrates the differences in calculated acreages between SMC and ERO.

	Disturbance within Permitted Disturbance Area (Acres)	ERO	Disturbance outside of Permitted Disturbance Area (Acres)	ERO	SMC Total	ERO Total
Stage 6 Embankment	23.48	22.79	0	0	23.48	22.79
Access Road and Infrastructure Relocation	6.42	5.5	0.72	0.72	7.14	6.22
Storm Water Runoff Diversion	0.33	0.33	1.03	1.03	1.36	1.36
Soil Pile E	0	0	8.05	8.05	8.05	8.05
Access Roads	3.26	3.62	2.62	2.62	5.88	6.24
Stage 6 Borrow Area	9.25	9.25	3.19	3.19	12.44	12.44
Powerline Corridor	3.09	3.49	5.86	5.88	8.95	9.37
	45.83	44.98	21.47	21.49	67.3	66.47

Section 2.2.1, Page 2-18
'Topsoil from Surface Soil Storage Area C and Surface Soil Storage Area B to Surface Soil Storage Area A1'

Comment #8:
The proposed action was subsequently modified in 2019 when the powerline, borrow area expansion, and relocation of soil storage areas were adopted into Amendment 003 in October 2019 and Soil Storage Area E was proposed.

Although the destination of Soil Storage Areas C and B were not specifically called out in the 2019 modification, the proposed action intended to allow flexibility such that Soil Storage Areas A2, B, or C could be relocated to Soil Storage Area D as needed. It is also SMC's intention to use Soil Storage Areas B and C as much as possible for the final reclamation soil placement on the downstream slope of the Stage 6 TSF.

Section 2.2.2, Page 2-18
'The duration of construction would be approximately 7 years. Beginning in year 1 (assumed to be 2020 for this analysis), SMC would relocate stockpiles and portions of the access road, power line, and fence. In year 2 (2021 is assumed), SMC would relocate the mine water recycle pond, pumps, pipelines, and the underdrain collection system. SMC would then engage in foundation preparation in year 3 (2022 is assumed). Stage 6 embankment fill placement would occur from year 4 through year 7 (2023 through 2027 is assumed).'
Comment #9:
Mine plans and construction schedules are updated at least semi-annually at SMC mining operations. To reflect the current 5-year mine plan, the above schedule summary should read, "*The duration of construction would be approximately 5 years. Beginning in year 1 (assumed to be 2021 for this analysis), SMC would relocate stockpiles, make improvements to the Lewis Gulch Road, and engage in foundation preparation and construction of portions of the Stage 6 west and north embankments. In year 2 (2022 is assumed), SMC would relocate a portion of the access road, fence, pipelines, and underdrain collection systems and continue to fill placement in the Stage 6 TSF embankments. Stage 6 TSF embankment fill placement would continue through years 3-5, with installation of the basin HDPE liner system in year 5 (assumed to be 2025).*

Section 2.2.3, Page 2-19
'Surface Soil Storage Area C location, and Surface Soil Storage Area C would be relocated to the Surface Soil Storage Area A1 west of the TSF.'
Comment #10:
See Comment #6

Section 2.2.5, Page 2-19
'Existing piezometer leads installed during previous TSF stages would be extended with the Stage 6 embankment raise along with the installation of five new slope inclinometers and ten vibrating wire piezometers'
Comment #11:
This statement is not accurate regarding new inclinometers and piezometers. The existing vibrating wire piezometers would be extended, however, there are no new piezometers proposed. Also, as described in the 3rd bullet in Section 2.2.5, the existing inclinometers would be extended and one additional inclinometer would be installed. SMC suggests

editing this sentence to 'Existing piezometer leads installed during previous TSF stages would be extended with the Stage 6 embankment raise.'

Section 2.2.5, Page 2-20
'Flow monitoring station EBR-003 would be reestablished to monitor flow levels in the East Boulder River.'
Comment #12:
Subsequent to the proposed action, a flow monitoring station at EBR-003 was established in 2019 cooperation with the USGS and is currently operational.

Section 2.2.8, Page 2-21
'Surface Soil Storage Areas B and C would be relocated to the Surface Soil Storage Area A1 west of the TSF. A.'
Comment #13:
See Comment #6.

Section 2.3, Page 2-23
'Vegetation (sensitive species) mitigation: SMC would conduct a sensitive species survey prior to construction. If sensitive plants are found, completion of surveys and successful application of protection measures is expected to mitigate any adverse impacts on sensitive species.'
Comment #14:
In preparation for permitting of future infrastructure needs (beyond the timeframe of the Stage 6 TSF), SMC conducted a baseline vegetation study of areas surrounding the Stage 6 TSF in 2016. This vegetation study, included in a report entitled, "Baseline Environmental Survey at the East Boulder Mine (March 2016)" contains a survey of sensitive species in and around the mine permit area. This report has recently been provided to the USFS and SMC asks that the Agencies consider whether the surveys that were done through this baseline study meet the requirement of this mitigation.

Section 2.3, Page 2-23
'An archaeologist would be present during implementation of the relocation and construction of the mine access road to identify the site and to ensure it is avoided.'
Comment #15:
Please clarify the conditions for the requirement for the archaeologist presence. As construction of this section of access road may require several weeks, SMC suggests that the archeologist be present to delineate the Agate Bench Site and observe the construction of the protective barrier berm to ensure full avoidance of the site, then return following the construction of this section of road to verify avoidance.

Section 2.3, Page 2-24
'Visual mitigation: during reclamation and closure, SMC would shape Stage 6 TSF to reflect a more natural landform, including topography variation and boulder placement, especially on the west side of the TSF, where the TSF can be viewed from the East Boulder Road.'
Comment #16:
During the revision of the East Boulder CORP in 2016, the reclamation plan was updated to remove the requirement for boulder placement in the embankment reclamation soil

cover because the existing boulder storage areas will be covered by the embankment fill. SMC suggests that the requirement for boulder placement be removed since the reclamation soils already contain boulders up to 18 inches in size and it is anticipated that the embankment crest and west slope will be covered by forest in the long-term. SMC would make every effort during reclamation to ensure that the embankment slope is well armored with cobbles and boulders that are intermixed with soil in the Soil Stockpiles.

Section 3.2.3, Page 3-6

'The west end of the TSF includes glaciolacustrine and alluvium/glacial outwash soils. Alluvial soils are south of the analysis area and on the east side of the East Boulder River.'

Comment #17:

The term 'glaciolacustrine' was used loosely during initial site investigations to describe finer-grained pockets of glacial soils within the till underlying the Stage 6 TSF. Updates to the site investigation included in the Knight Piesold (KP) Geological and Geotechnical Site Conditions report confirmed that glaciolacustrine soils are not present in the Stage 6 TSF foundation soils and corrected the improper use of this term in earlier reports. Section 4.2.1 of the Geological and Geotechnical Site Conditions report reads, "*The overburden at the Stage 6 TSF Area primarily consists of Glacial Till emplaced as Lodgement (Basal) Till. … the drillholes at the TSF area have not encountered Glaciolacustrine Deposits. The site investigation results and interpreted depositional environment suggest it is unlikely that Glaciolacustrine Deposits are present in the upper portion of the Glacial Till underlying the Stage 6 TSF.*"

Section 3.2.4.2, Page 3-8

'As discussed under the No Action Alternative, a TSF breach analysis developed for Stage 3 indicated the potential for damage to buildings/structures, loss of life, and release of fine-grained materials to the East Boulder River and Yellowstone River.'

Comment #18:

SMC suggests changing this sentence to read, "…fine grained materials to the East Boulder River and Boulder River." Release to the Yellowstone River 30 miles downstream was not contemplated in the TSF breach analysis.

Section 3.3.3, Page 3-1

'The climate in the analysis area is generally dry and cold with annual precipitation of 20 to 25 inches and annual average temperature of 38°F.'

Comment #19:

Please reference the KP Climatological Site Conditions report from May 2019 which states that the annual average precipitation at the East Boulder minesite is approximately 27 inches, or in terms of annual precipitation range the EA would be more accurate in using 25-30 inches. The 2019 Climatological Site Conditions report also states that the annual average temperature at the minesite is 42°F.

Section 3.3.4.1, Page 3-14

'Reclaimed areas not having existing subsoil would receive about 22 inches of subsoil followed by 6 inches of organic-rich topsoil.'

Comment #20:

See Comment #6. SMC suggests using the phrase '28 inches of soil cover' in place of the 22 and 6.

Section 3.3.4.1, Page 3-15
'The final cap of the TSF surface and embankments would consist of 24 inches of waste rock under 22 inches of subsoil followed by 6 inches of organic-rich topsoil, which would provide a growth medium for vegetation and minimize erosion (SMC 2016).'
Comment #21:
See Comment #19.

Section 3.3.4.1, Page 3-17
'State law requires that there would be no accumulation of stagnant water in the development area to the extent that it could serve as a host or breeding ground for mosquitoes or other disease-bearing or noxious insect life (82-4-336(5), MCA). Settlement of the TSF cap could potentially create ponded water.'
Comment #22:
SMC suggests that the net gain in biodiversity created by ponded water (wetland vegetation and biota) outweighs any concerns of insect density. SMC understand the existence of this statute but wonders if the statute was intended for development areas that are closer to areas of human habitation.

Section 3.3.4.1, Page 3-17
'Adequate rooting depth for most seeded and planted vegetation would be achieved by applying 6 inches of organic-rich topsoil over 22 inches of subsoil to all disturbed surfaces that are not over native soil.'
Comment #23:
See Comment #19.

Section 3.3.4.2, Page 3-20
'By raising the TSF 14 feet, resulting erosion, cover loss, and vegetation failure could indirectly lead to potential TSF failure.'
Comment #24:
SMC suggests that this is not a credible failure mode and should not be referenced as such. A review of the Appendix H Failure Modes and Effects Assessment did not turn up any reference to the failure mode quoted here. When asked to review this statement, KP commented, "Erosion, cover loss, and vegetation is a maintenance issue. For this to advance to a state that would lead to potential TSF failure is not plausible."

Section 3.3.4.2, Page 3-20
'Dam failure at the site could result from an extreme storm or a large seismic event (Knight Piésold Ltd. 2020)'
Comment #25:
When asked to review this statement, KP commented, "This is taken out of context and is not KP wording. The design has accounted for the probable maximum flood as well as the Maximum Credible Earthquake as per the legislation."

Section 3.4.3.2, Page 3-21
'It is possible that settlement of the TSF could take place over many years, even after post-closure and joint reclamation bond release, and possibly affecting the stability of the TSF embankment.'

Comment #26:
A review of the Appendix H Failure Modes and Effects Assessment (FMEA) did not turn up any reference to the settlement of the TSF referenced here. The FMEA did include a potential failure mode for embankment deformation that could be caused by an earthquake, however, there was no reference to an effect on the stability of the TSF.

Section 3.4.3.2, Page 3-28
'Synoptic survey results indicate the groundwater system discharges to the river between wells EBR-003 and EBR-004 with the influx limited by the low permeability glacial till in the area (Hydrometrics, Inc. 2017). Between well EBR-004 and above Wright Gulch, which is near the toe of the glacial terminal moraine, the groundwater system gains about 3 cubic feet per second (cfs; 1,300 gpm) from this losing section of the river where the river channel passes from the low permeability glacial till into much higher permeability proglacial alluvium (Hydrometrics, Inc. 2017). See Section 3.5, Surface Water Hydrology for further discussion of the East Boulder River.'
Comment #27:
The synoptic survey sampling site designations quoted in this section are surface water monitoring sites and not 'wells'. Also, this section is missing discussion regarding groundwater discharge to the river between Wright Gulch and EBR-005, which is a critical finding and conclusion of the synoptic survey as it relates to groundwater interaction with the East Boulder River. SMC suggests that Section 3.4.3.2 borrow language from Section 3.5.3.1 (page 3-38) which is a better characterization of the groundwater/surface water interaction.

Section 3.4.3.3, Page 3-29
'In 2007, an untreated adit water release occurred, resulting in a sharp increase in dissolved salts and nitrogen as measured in groundwater monitoring well EBMW-6 located at the north embankment (DEQ and Forest Service 2012a). The release resulted in the exceedance of SMC's MPDES Permit No. MT0026808 limit of 30 pounds per day of nitrogen and exceedance of the Class I groundwater beneficial use criterion for electrical conductivity of 1,000 micromhos per centimeter (DEQ and Forest Service 2012a).'
Comment #28:
SMC suggests removing the reference to the 2007 adit water release. As SMC was initially investigating the source of nitrogen in the downgradient monitoring well EBMW-6, the company pointed to this 2007 event as the leading theory as to the source of nitrogen. In subsequent studies and drilling investigations (Hydrometrics 2018b), it was shown the waste rock fill in the TSF embankments was the source of the elevated nitrogen in EBMW-6 and other downgradient wells and that the 2007 event was likely not a factor in the increase of groundwater nitrogen.

Section 3.4.4.2, Page 3-33
'During Stage 6 construction, the potential exists for a short-term release of residual nitrogen from waste rock used for construction prior to completion of the extension of the embankment underdrain capture system. This would be considered minor due to SMC's reduction of residual nitrogen by 50 percent because of their change in explosives.'

Comment #29:
A change in explosives was a short-term mitigation that was used in the 2012-2015 timeframe prior to the construction of the embankment underdrain. SMC intends to mitigate the potential for short-term release of residual nitrogen from Stage 6 TSF embankment construction by primarily using native borrow material for the foundation of the embankment up to the elevation of the underdrain capture system. Waste rock placement would be focused above the elevation of the extension of the embankment underdrain.

Section 3.6, Page 3-49
'See the Vegetation Report and Biological Evaluation East Boulder Mine Stage 6 Tailings Storage Facility Expansion Project (Vegetation BE; ERO 2020a) for a more detailed discussion of impacts and for the regulatory framework specific to the vegetation analysis.'
Comment #30:
SMC could not find a file or link to the Vegetation BE, ERO 2020a.

Section 3.6.3.3, Page 3-53
'In 2009, CGNF conducted sensitive plant surveys within the proposed East Boulder Fuels Reduction Project treatment areas (Forest Service 2011). Given that the proposed treatment areas are adjacent to the mine permit area, the results are discussed here. The EA (Forest Service 2011) reports that "…there is some potential habitat for 5 [special status] species within the proposed treatment areas: Small-flowered columbine, small yellow lady's slipper, Northern rattlesnake plantain, Hall's Rush (Juncus hallii; removed from the species of concern list in 2012 [MNHP 2019]), California false hellebore (Veratrum californicum)." These species were targeted in the 2009 surveys but were not documented in the proposed treatment areas'
Comment #31:
See Comment #13. In addition to the CGNF sensitive plant survey, SMC suggests referencing the KC Harvey "*Baseline Environmental Survey at the East Boulder Mine* (March 2016)" in this section.

Section 3.6.4.4, Page 3-57
'As described in the Vegetation BE (ERO 2020a), SMC would conduct a sensitive species survey prior to construction. The plant survey results would be provided to the agencies for review prior to construction.'
Comment #32:
See Comment #13. Adjust the language in this section accordingly.

Section 3.9.4.3, Page 3-83
'An archaeologist would be present during implementation of the relocation and construction of the mine access road to identify the site and to ensure it is avoided.'
Comment #33:
See Comment #14. Adjust the language in this section accordingly.

Thank you for the opportunity to comment on the Stage 6 TSF Draft EA. Please call me at 932-8259 if you need any clarification regarding these comments.

Sincerely,

Matt Wolfe
Environmental Manager
East Boulder Mine