Oct 27, 2020

Re: Stibnite Gold Project DEIS #50516

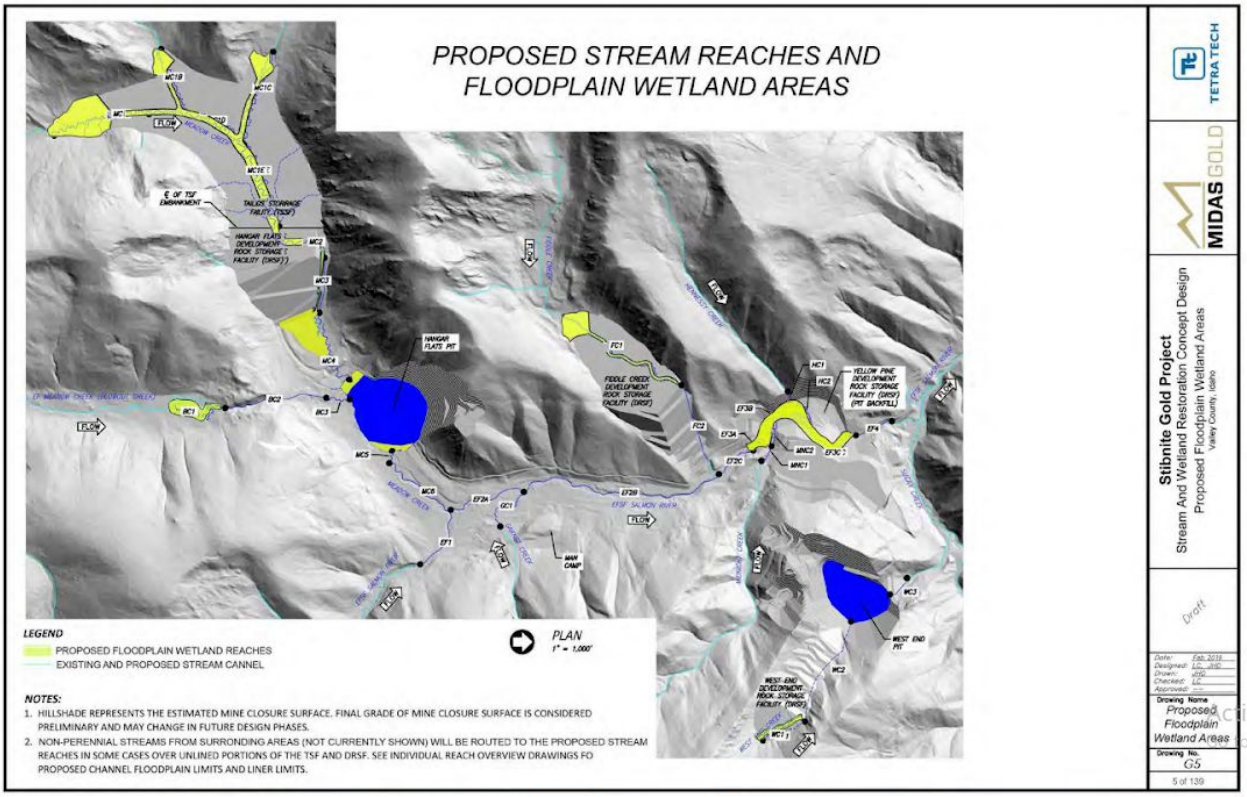
Dear Supervisor Linda Jackson and Chief Vicki Christiansen,

My name is Dr. Natalie Kramer Anderson. I hold a PhD in fluvial geomorphology with a specialty in woody debris from Colorado State University. I am an active member of the wood in river research community and I regularly review and publish scientific studies on the subject. I also regularly enjoy kayaking in Idaho, including the South Fork Salmon watershed. I recently reviewed parts of the DEIS about the Stibnite mine project proposed by Midas Gold. This project emphasizes their restoration actions as a selling point for their project. In this letter I am mainly focusing my concern on the management and storage of the tailings piles and feel that a supplemental DEIS is warranted to address presented shortcomings in this area.

It is easy to get lost in the details of this report and start to feel like the company will be able to mitigate a lot of the concerns regarding water pollution and impacts to the ecology (especially fish). However, I encourage you to take a big picture view of this project. At its core, this project proposes to store mine tailings in the bottom of valleys, reconfiguring the landscape to create hanging valleys of mine tailings (see CAD drawings in Appendix D of the DEIS, also copied below). The biggest issue with storing huge amounts of mine waste in the bottom of valleys, is that this is precisely where water collects and it is the flow of water through these tailings that will mobilize and collect contaminants. Although they propose a system of drainage pipes and liners that are supposed to keep these contained, viewed on a legacy timeline of generations the water will win and this will release contaminants downstream. Furthermore, they propose making a steep channel along the face of the tailings pile to connect the restored and elevated wetland area to the river channel below. Basically, they are creating a huge drop in elevation which creates a 'knickpoint', a point of an increase in kinetic energy and focal point for erosion. Are we really sure that the channel that is proposed will be able to be maintained for posterity? Has Midas adequately addressed this issue? At some point in the future, I would not be surprised if the water starts eroding the face of the tailings piles[1]. Also, I have serious doubts that fish would be able to navigate upstream of the tailing piles to access the restored wetland areas on top- so you will lose the areas upstream of the tailings piles as habitat for migratory fish[2].

[1] See DEIS at 4.9-144 "Additionally, if the growth media cover erodes in places and runoff contacts the underlying development rock, constituent concentrations in downgradient streams receiving the runoff could prove to be higher during the post closure period."

[2] See DEIS at 4.12-13 "Due to the high gradient (greater than [>] 20 percent), this channel would require a continuous series of step-pool structures, constructed of large, keyed-in boulders. Natural upstream fish passage would be blocked due to the steep gradient."



Screenshot from DEIS, Appendix D: Restoration Design Sheets, Drawing G5, 5 of 139.

Furthermore, I felt that no true alternatives were presented for the management of tailings piles. The alternatives that Midas Gold put forth were essentially variations on the same theme, fill the river valleys with mine waste and then do some natural landscaping on top of that. Thus, they are really only presenting the USFS with one option: allow Midas to fill the streams with tailing waste or don't permit. Are the only options to fill the valleys with the tailings? Is there any option that would keep the riparian areas and the river from becoming buried in mine waste? For example, would it be possible to engineer a way to store the mind tailings as terraces along the river valley slopes and then have a wetland area at the bottom of the slopes to help capture and store and process contaminants and water before it enters the river channel (wetlands are excellent for purifying and cleaning up water[3])? Another alternative is to use drystack tailings, which is recognized by the mining industry as a more sustainable and ecological way of managing tailing waste[4]. In the current DEIS, I was surprised that it was never even considered. I would like to see MIDAS present some true alternatives for tailings managament in a supplemental DEIS.

As the U.S.F.S. reviews this proposal, I encourage you to ponder the mine in the context of the surrounding watershed and have independent, unbiased experts/ scientists provide the public

[3] For example: https://www.sciencedirect.com/science/article/pii/S1687428520300492, https://www.sciencedirect.com/science/article/pii/S1687428520300492

[4] https://www.miningmagazine.com/life-cycle-end-of-life-management/news/1264279/stacking-benefits

and the U.S.F.S. with more specific information on the following questions. Is the surrounding landscape and ecology robust enough that it can handle a hit to this specific area at this moment in time? Or, is the general health of the fish and wildlife populations precarious so that this sort of activity may adversely impact the entire watershed for generations? Even if Midas does an amazing job at restoration, will the ~13 years of heavy environmental impact during the mine's operation detrimentally impact fish populations so that they will be unable to recover post mining? In fact, the USFS is required to take a "hard look" at these kinds of indirect and cumulative impacts under NEPA[5]. Ultimately the decision to permit will be one of values. Is the acquisition of gold and short economic benefits over a 13 year period worth the generational impacts that this activity will have on the lands for centuries?

I encourage the USFS to request a supplemental DEIS that addresses my concerns regarding the tailings pile management as stated above. In addition, I felt that a supplemental DEIS should address the following specific concerns I have about MIDAS's restoration and mitigation plans. The USFS should require MIDAS to address these issues using the best available science, which I found lacking[6]. I was disappointed that MIDAS mainly just cited their own subconsultants when presenting best restoration practice ideas.

1. There is no doubt in my mind that this project will negatively impact fish passage and habitat. As does MIDAS, I have huge doubts that the fish tunnel proposed will actually work[7]. Please provide literature outside of citing your own subconsultants on the efficacy of using lighted tunnels for fish passage.

2. The report mentions removing existing 'barriers' to improve fish migration. In one location in the report, they mention that these barriers are woody debris jams[8]. There is a lack of scientific consensus that these jams actually impede fish passage. This sentiment is mostly a legacy misperception[9], most literature points to the benefit of wood to fish[10]. So, removing them does not necessarily equate with improved passage and may have the opposite effect of damaging habitat[11]. Given the lack of information or details provided on the existing barriers, it is impossible to assess whether the proposed activity of removing all the wood will benefit the fish and I would posit that the act of removal is more likely to damage fish habitat. A supplemental DEIS should include a lot more details on this proposed action.

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[5] See Robertson v. Methow Valley Citizens Council, 490 U.S. 392 (1989).
[6] Note that the U.S.F.S. states that, "We use the best scientific knowledge in making decisions and select the most appropriate technologies in the management of resources."
[7] DEIS "After close collaboration with other agencies, meeting passage criteria, and executing all adaptive management measures, there exists reasonable probability that the project won't be able to pass fish safely, timely or effectively"
[8] See DEIS pg. 28/ Table D-2 "Midas Gold will improve fish passage conditions in the steep and woody debris-clogged portion of the EFSFSR stream channel just upstream from the confluence with Meadow Creek."
[9] https://anrcatalog.ucanr.edu/pdf/8157.pdf
[10] https://doi.org/10.1577/1548-8659(1983)3<322:TRAMOW>2.0.CO;2
[11] https://journals.sagepub.com/doi/10.1177/0309133314548091

3. The proposed wetland restoration does not guarantee that a wetland will be restored. Putting in a single threaded meander is not equivalent with creating wetlands. What is most important is that the stream is encouraged to move and create its own secondary channels [12] [13]. The restoration plan for the river is over engineered and reminds me of restoration actions that were deemed good 10-20 years ago. It appears that river mobility will not be encouraged, but rather the water will be constrained within the fabricated and restored single channel.

4. In the natural environment, the addition of woody debris to streams generally increases the complexity of the river planform, forces water onto floodplains and encourages multi-threaded flow[14]. This plan limits the floodplain area and uses woody debris more as an erosion control measure than as a measure to increase planform complexity. I would like to see a plan that re-incorporates the mobility of wood, which is just as important as sediment and water mobility[15], into the restoration design. In a supplemental DEIS, I would like to see a whole separate section on woody debris management that goes beyond using wood to control bank erosion.

5. The proposed tortuously meandering planform is out of character with existing stream reaches. The proposed grade of the top of the tailings is really flat. A stage 0[16] type restoration scheme would be more appropriate in this location.

6. The plan has meander bends butting up against the edge of their inset floodplain. Putting the outside of a meander bend at the edge of your lined floodplain is asking for trouble since this is where most erosion happens[17].

7. The report mentions putting in small impoundments that would act like beaver dams implying that they will help create wetland habitat just like beaver dams[18]. I doubt these impoundments would actually create wetlands like beaver dams because it misses the dynamic element. Beaver dams create wetlands because they are built, expanded and then abandoned and created elsewhere[19] [20]. Also, beaver dams are porous, allowing the movement of water and animals through them[21], I doubt these impoundments will be porous.

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[12] https://www.sciencedirect.com/science/article/abs/pii/S0048969720303272
[13] https://doi.org/10.1029/2018WR024433
[14] https://journals.sagepub.com/doi/10.1177/0309133314548091
[15] https://doi.org/10.1093/biosci/biz013
[16] https://onlinelibrary.wiley.com/doi/full/10.1002/rra.3378
[17] https://doi.org/10.1029/2001WR000602
[18] See DEIS 2-44 “water retention features near the old reservoir water retention dam location to elevate the groundwater level and stream water surface sufficiently to restore wetland hydrology in the surrounding meadow. The retention structure would function like a beaver-dam impounded system, slowly filling with sediment over time.”
[19] https://doi.org/10.1002/esp.2261
[20] https://doi.org/10.1130/G32682.1
[21] ISBN-13: 978-1603587396

Thank you for taking the time to review my comments. Please 1) respond to my concerns individually, and 2) provide information accordingly in a supplemental DEIS for public review. Feel free to contact me if you are interested in following up with anything I have presented here.

Regards,

Dr. Natalie Kramer Anderson