What Matters in Our Valley

Telkwa Coal Tenas Project Public Comment

July 21, 2022

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2	Giles Wendling, P. Eng.	Environmental Law Alliance Worldwide	ELAW, Wendling
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3	Patrick Littlejohn, P. Eng.	Northwest Institute	NWI, Littlejohn
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Our community group, What Matters in Our Valley is submitting the following comments to the Environmental Assessment Office of British Columbia regarding Telkwa Coal Ltd.'s application for an Environmental Assessment Certification for its proposed Tenas Project.

1. Water Matters:

A. Water Quality

In its Mine Application, Telkwa Coal acknowledges that its activities will release selenium cadmium and other heavy metals, as well as nitrites and sulphate and acid rock drainage material (ARD). (SkW, Berchtold, p. 4; ELAW, Wendling, p. 5) These substances are toxic to fish. In sufficient quantities, they also pose a risk to human health. They will pollute our waters and add to the already substantial burden of cumulative effects that threaten our water quality and fish

For example, Telkwa Coal admits that, even under best case scenarios, its mining activities will result in selenium being discharged into the three creeks that are adjacent to the proposed mine location in amounts that will exceed Provincial Water Quality Guidelines (WQGs) by as much as 3 times (EAO Open House, 6-1-2022 JG). Their overall objective for the whole mine is even worse: 4 times WQGs. (Open House, 6-1-2022, JG).

In fact, Telkwa Coal believes that its selenium releases will be so large that it seeks a variance from Provincial water quality guidelines by between 4 and 17 times the standards, or even up to 25 times. (NWI, Littlejohn, p. 7). This is far worse than the numbers stated at the EAO Open House in Telkwa on June 1, 2022 and calls into question Telkwa Coal's reliance on its best case rosy projections.

This more pessimistic approach may be because Telkwa Coal realizes that its sampling methods were inadequate to provide a realistic estimate of the amount of contaminants its mine will release. (NWI, Littlejohn, p. 1) So, they hedge their bets by asking for waivers way over their projections. Their projections should not be trusted and the assessment should be performed based on the limits of the variance requests.

WQGS will also be exceeded for some of the creeks during certain water flows for other heavy metals and toxins as well, including cadmium, nitrite and sulphate. (SkW, Berchtold, p.4). In less than best case scenarios, BC guidelines for aluminum, copper, and zinc will also be exceeded. (SkW, Berchtold, p.16) These substances are also toxic to fish and other aquatic life.

It should also be noted that the Province's record for enforcing its own water quality guidelines is miserable. Neither the Teck Resources mines in the Elk Valley nor the coal mines in Tumbler Ridge meet the rules. Teck Resources has spent over 1.2 billion dollars trying to remove selenium pollution at its coal mines with no success. (ELAW, Wendling, p. 3, fn.1)

Perhaps equally as troubling here, the amount of these substances that will be released, at least in the case of selenium and nitrates is 200-250 times the background amounts in our waters. (ELAW, Wendling, pp. 4, 5; NWI, Littlejohn, p. 2) The impact on aquatic life depends to a substantial degree on this background

rate and not just WQGs. (SkW, Berchtold, p. 3; ELAW, Wendling, p. 2 (determines amount of cumulative effects))

As noted, Telkwa Coal admits in its mine plan that it will cause acid rock drainage and release of toxic materials resulting in contamination of nearby waters. To manage the runoff from Acid Rock Drainage, Telkwa Coal proposes to build three impoundment areas, the so called North, East and West "pits". While described by Telkwa Coal as pits, the North and East areas are no such thing. They will not be dug out of the ground. Instead, they will be constructed from ground up. This means in this case they will require dams that are up to 30 metres high. (Open House 6-1-2022, JG; SkW, Tuzlak, p. 34)

As these "pits" are filled with acid rock generating material, the waste rock will be first covered with water. Even though these materials become reactive as soon as they are exposed to the environment, the acid rock generating material will be left outside and on the ground for the first 6 months while the first "pit" is built. (Open House 6-1-2022, NC) When the containment area reaches maximum capacity, the water will be covered with first supposedly non-ARD generating material and then so-called "overburden" (rock stripped away when digging the operations pit) and then top soil. (Open House, 6-1-2022, JG)

Will these containment areas work? Many of the details about the construction of these facilities are left out of the mine plan, including site preparation, and the sequence of construction and installation of key features. (ELAW Wendling, p. 4) What details that are provided are disturbing. The mine plan relies on construction materials for dams and covers that for the most part are taken from the site. Yet, Telkwa Coal has not performed adequate tests to show that it can separate these construction materials from ARD generating substances. (NWI, Littlejohn, p.8). If the materials that are used include acid generating rock, then they will start causing ARD and this will not be contained because it will be on the outside surface of the containment structures and, so exposed to the elements.

As noted, the Mine Plan also contemplates not covering the ARD material for a period of up to 6 months while the containment areas are constructed. The timing of the submergence of ARD materials is critical and the Plan does not provide for how these materials can be submerged if they start reacting within this period. (NWI, Littlejohn, pp. 10-11)

Moreover, as noted previously, the materials at the mine site include, in addition to selenium, other heavy metals including arsenic and cadmium. These metals leach from rock even in the absence of ARD. (NWI, Littlejohn, pp. 12-13) Yet, there is no plan to treat water that is contaminated by these sources.

Perhaps most disturbingly, Telkwa Coal chose to design its containment impoundments without regard to predictions about worst case severe weather events. (SkW, Tuzlak, p. 34)

We know that weather conditions are becoming more extreme. We know how the mine area has experienced some of the most severe flooding events in the Valley. The bridge to the mine area over Goathorn Creek has been repeatedly washed out and the access road area has had mudslides closing it down. Even under the best case scenarios reported in the mine plan, these waste impoundments will seep and release their toxins. But, should we trust this "best case?" We all know what happened at Mt. Polley. Including the Mt. Polley disaster, in the last 7 years alone, there have been 4 major failures of

mine dams used for similar purposes, killing 289 people:
(https://www.science.org/doi/10.1126/science.369.6506.906)

A recently released report on tailings ponds and mine dams in B.C. emphasizes this concern:

https://reformbcmining.ca/tailings-map/?utm_source=delta%20optimist&utm_campaign=delta%20optimist%3A%20outbound&utm_medium=referral

Such dams fail with some frequency and, over time deteriorate. Here, the time frame is basically forever since these toxic substances must be kept away from the environment in perpetuity.

In our own area we have witnessed disastrous releases of toxins from our local mines, including Equity, Huckleberry, the Glencore Mines in Babine Lake and, to a lesser degree, the Duthie and Cronin mines. If these areas at Telkwa Coal fail, the material will pour downhill to the Telkwa causing irreparable damage and potential loss of human life and putting up to 200 people at risk. (SkW, Tuzlak, pp. 3,7,34). In fact, the Mine Application itself lists this plan as posing the risk of "very high" consequences for just these reasons. (SkW, Tuzlak, p. 3; TC Management Plan, Sec 13, Chapter 11, Mine Site Waste Management, Plan, Table 6-1-12)

Even if there is no catastrophic failure, how much leakage will occur? Will Telkwa Coal properly maintain these areas for the necessary period of time – which in this case is forever? How much bond will they have to put up? What amount of money could compensate all of us for ruining the Telkwa and, potentially, the Bulkley? How about for loss of life and homes?

Finally, there is the railroad load out on the Bulkley River in Quick. That loadout is in a flood plain. (SkW, Tuzlak, p.36) That means that it is an area that has flooded over the years either due to precipitation events or from ice jams. In response, Telkwa Coal claims that the railroad has not been affected in its close to 100 years of operation.

However, a report titled Flooding and Landslide Events, Northern British Columbia 1820-2006 (attached) identifies 109 flood and ice jam incidents in the Telkwa area, including a flood that took out the bridge in Huber in January, 1919 (Flooding Report, p.15) and 10 major events in the Walcott to Telkwa area, including three that blocked the rail line along this stretch. One of our sources reports a flood in the loadout location itself within recent memory.

Moreover, the flood hazard map produced for this section of the Bulkley River for 6-2-2022, shows the load out area as squarely in the path of potential flooding for that high water event. (Compare Smithers, Telkwa and RDBN Hazard Notice map,6-2-2022, attached with Telkwa Coal, Tenas Project Components Map,6-1-2022, attached)

Strangely, no overall flood hazard maps are included in the mine application. (SkW, Tuzlak, p.36) No direct studies were conducted to determine the frequency of floods at the load out site. Yet, clearly the risk is growing. Climate change is already rapidly increasing the frequency of extreme weather events. Just look at what is happening in our own Province.

Telkwa Coal, without adequate study dismisses the risks of storing coal and other toxic materials in a floodplain on the banks of the Bulkley. If there is a flood, then large amounts of coal, which in itself can generate an acid rock reaction, along with other toxins will be washed into the river, flow downstream and then be deposited on shorelines over long stretches of the river. This coal and other materials will start contaminating the river and what will be the impact? Could it ever be cleaned up? What would be the cost?

B. Water Flows:

Water flows will also be affected. In the Mine Application, Telkwa Coal claims that it will primarily rely on precipitation and snow melt for the water it needs for its operations, mainly for cleaning coal, but also to keep containment ponds filled. It claims that, by its projections, it may need only as much as 14,000 m3/month of water (equal to 168,000 m3/year). (ELAW, Wendling, p.7). At the same time, it also states it plans for a "contingency" amount of 1.5 million m3/year and that this contingency could possibly be met from wells dug along Goathorn Creek near the mine. (ELAW, Wendling, p.7) That's some contingency (over 9 times the predicted amount)! Besides, there are no such wells in existence and the Mine Application does not include a study that shows that such wells are even possible. (ELAW, Wendling, p. 7)

We live here and we know just how undependable and unpredictable the rain and snow melt events can be. Of course, precipitation and runoff won't be enough. So, for a "contingency" Telkwa Coal relies on wells that do not exist and for which they have done no studies.

Really, what this all adds up to is that they do not want to admit how they will meet needs that are above their manifestly unreliable projections. Of course, the most likely source for extra water is the Telkwa River. Maybe that's why Telkwa Coal did not provide evidence of how they will keep ARD materials covered in dry periods. (NWI, Littlejohn, p. 12)

Before this mine is approved, the Province needs to make sure that this kind of fudging of numbers is cleared up. What do they mean by a "contingency" that is 9 times the projection? Under what conditions would they need to resort to this contingency? How often? How will this contingency be met and what will the impacts be of doing so? How much will it affect spawning fish and other aquatic organisms? These studies need to be done and the answers provided before any further decisions can be made about this proposal.

Even without taking this "contingency plan" into account, water volumes in the creeks and rivers will be significantly impacted. These impacts can both increase flow when discharge from containment areas must take place because of high water events and decrease the flows when water must be drawn from the streams and connected water sources due to dry periods. Reductions in flow can range from as much as 34% and increases can range as high as 45%. (SkW, Tuzlak, p.31. Timing of water quantity and water temperature is critical to fish. Will the fish populations be adversely affected?

Action Items:

As recommendations to the Environmental Assessment Office to insure that adequate information has been provided, we would suggest:

1. Require a detailed construction plan for the containment areas designed to protect against acid rock drainage, heavy metals and other toxins. Such a plan must account for dam materials and, the ability to segregate those construction materials between ARD and non-ARD potential. It must also take into account the actual geology of the area including the channelled, fractured and faulted nature of the subsurface ground and rock. Seepage must not be allowed since it will result in permanent and irreversible damage to the Water Valued Component. In addition, since Telkwa Coal states that it intends to allow Acid Rock Drainage material to be exposed for up to 6 months while containment facility construction takes place, there must also be a study of the impacts of allowing this to happen since ARD reactions can start as soon as exposure occurs.

Any such plan must be based on withstanding worst case weather events.

2. Require a study of impacts on water that provide forecasts beyond the 2100 time-limit contained in Telkwa Coal's current analysis. As the Telkwa Coal study indicates, negative impacts grow over time as the containment structures deteriorate. Such a study should take into account the need to permanently control ARD and other contaminants, as well as the likely impacts of climate change. Anything less will not only ignore obvious threats to the environment, including water as a Valued Component, but to human life and property as well.

3. Require a study that expressly reports alterations to baseline conditions and not just conformity to water quality guidelines. Since water has been identified as a Valued Component, the rule requires no damage to the natural conditions, not just no damage as based on the somewhat arbitrary guidelines. To determine if damage is occurring, baseline amounts must be included. If the baseline has already been impacted by earlier human disturbance, then the likely conditions prior to such disturbance should also be assessed. This last measure is necessary to analyze cumulative effects.

4. Provide a full analysis of the likelihood and costs of a catastrophic dam failure on human life and property and water quality, including drinking water in Telkwa and Smithers, as well as other Valued Components such as fish. Since these containment structures are identified as posing a Very High Risk of significant adverse consequences, there can be no assessment of costs without this information.

5. Provide a study of impacts on water quality and water flows based on multiple scenarios consistent with climate change models.

6. Require a realistic plan for water usage that expressly assesses and states the conditions under which the "contingency" water use sources will be required, the frequency of the need to resort to such sources, the sources for such contingency water supplies, and the impacts of the reliance on such sources on water quality and flow in those sources. This report should provide detailed analysis of the proposed wells on Goathorn Creek, including feasibility and impacts if such wells are considered a potential source of the contingent water supply.

7. The plan does not provide for treatment of the water from the sedimentation ponds or the runoff from the containment structures and this water will contain materials that can cause acid rock drainage, as well as release of heavy metals, nitrates and other contaminants. A report should be prepared identifying how those toxins will be controlled both during operations and afterwards. BC policy requires use of best available technology and such technology exists for removing these materials. (NWI, Littlejohn, pt. 5)

By failing to use these technologies, sediments and other toxins will flow into the creeks and then the Telkwa River.

8. Provide a report adequately reviewing the potential for floods along the rail road load out area, taking into account the predictions for climate change and accounting for the impacts if such a flood does occur, including on water supplies in Smithers and Telkwa and on aquatic life and water quality. Such a report should include a study of the frequency of past flood events at the loadout location itself.

9. Any monitoring plan must be permanent since the potential for the release of toxins lasts in perpetuity.

10. Any request to allow the release of selenium and other heavy metals, sediments and toxins above Provincial Water Quality Guidelines should be rejected, especially since Telkwa Coal has chosen not to implement best available technology for water treatment. (NWI, Littlejohn, p. 2, pt.5)

11. Alternatively, best available technology for water treatment should be required and the Mine Plan must take this into account.

12. Since Telkwa Coal is asking for variances of provincial Water Quality Guidelines that would allow releases of selenium and other toxins up to 25 times the limits, all potential impacts should be measured at this level and not just the reduced levels identified in what are Telkwa Coal's manifestly overly optimistic scenarios. These studies must report on potential adverse impacts on the municipal water supplies for both Telkwa and Smithers by selenium and other pollutants for releases at this high an amount.

2. Fish Matters

Given all of the above, what is the likely impact on fish?

The creeks around the mine provide very important for salmon, steelhead, trout and other fish. (SkW, Berchtold, p.4) In fact, Goathorn Creek and adjacent creeks produce a large proportion of the steelhead in the Telkwa River and the Telkwa Steelhead provide an important contribution to the overall Skeena Steelhead population. (SkW, Berchtold, pp. 24-25)

Given the above impacts on water quality, there is likely to be fish mortality and harm to fish eggs and juveniles. (SkW, Berchtold, pp. 4, 16) There's just really no way around this. The Mine Application acknowledges that toxins will be released that have these impacts on fish.

Telkwa Coal claims it can mitigate these impacts on fish, by creating alternative habitats. But, most such mitigation efforts fail. (SkW, Berchtold, p.4)

Action items

As recommendations to the Environmental Assessment Office to insure that adequate information has been provided, we would suggest:

1. The report on likely impacts on fish should identify baseline historical numbers, not just current numbers form depleted fish populations. Without the historical number we will not know true impacts

and, in any event, from the point of view of protecting the health of our fish populations, this is the most significant and pertinent information.

2. The report should contain a realistic assessment of fish mortality and of overall impacts on fish populations.

3. All potential spawning sites should be reviewed for potential impacts. Not all were in the mine application, especially for blue listed bull trout. (SkW, Berchtold, p.3)

4. There was no assessment of the impacts on spawning chinook from contaminants released at the railroad load out, including the likely effects of a flood. (SkW, Berchtold, p.3)

5. Assessments from impacts on fish due to changes in water flow and water temperature were also lacking and should be done (SkW, Berchtold, p.3)

6. Concentrations of contaminants at creek mouths (e.g., the Telkwa) were not assessed and should be to obtain an accurate estimate of impacts on fish. (SkW, Berchtold, p.p. 3-4)

7. All of the above assessments must be done using realistic and reliable data on the release of toxins. That data is not currently available because inadequate sampling has occurred. That sampling must be required before an Environmental Assessment can be finalized

8. Any mitigation plan must be presented in detail and measured against its likelihood of success based on prior plans of this nature.

3. Caribou Matters

Somewhat unbelievably, the Telkwa Coal project is located right smack inside the Wildlife Habitat Area (WHA) that the Province recently established as part of its effort to save the local caribou herd that is classified as at Imminent Threat of Extirpation under the federal Species at Risk Act (SARA).(WMIOV, LV, p. 1)

The main threat to caribou survival is loss of habitat. Total disturbed area in the Telkwa Caribou Population Unit WHA already exceeds federal guidelines under SARA. (WMIOV, LV, p.1) Telkwa Coal did not bother to mention this in their mine application assessment.

The mine plan, if approved will create a disturbance area of at least approximately 19,000 hectares (including the mine site, the road, the load out and a noise area of about 4 kms. - this latter figure is based on Telkwa Coal's own questionable calculations of the range of noise impacts from the mine operations - since Telkwa Coal apparently did not model for noise above the pit areas, this is probably a vast underestimation). (WMIOV, MH Disturbance map).This is about 8% of the total Telkwa Caribou WHA and a much larger percentage of that part of the WHA covered by low elevation forest habitat. It is this low elevation forests where the mine and the haul road are going to be located.

Caribou need these areas for foraging arboreal lichens (lichen that grows on trees) in those winters when the high elevation terrestrial lichen they usually survive on are not accessible because of snow and crusty

ice conditions. (WMIOV, LV, p.2) In those times, they descend to eat the arboreal lichen in the trees. This lichen is most prevalent on mature trees. (WMIOV, LV, p.2)

Also, Caribou flee disturbance. (WMIOV, LV, p. 2)

So what happens when the area they need is cleared of trees, and an open pit is dug with repeated use of explosives? What happens when a road cuts through the forest they need and heavy trucks rumble back and forth hauling coal multiple times per hour? What do you think?

Instead of conducting a serious analysis of the risks to recovery of a federally protected caribou herd, Telkwa Coal reports that it simply studied the area for two years and did not find any caribou (the study was conducted from 2017-2019 during depressed caribou numbers).

The current herd is at around 30 (WMIOV, LV, p. 1), down from around 114 in 2006 (LV, p.1), but up from its most recent minimum of around 16 in 2013-2014. The Provincial target for restoring the herd is 150. (WMIOV, LV, p.2)

Historical data collected from caribou radio collars shows that the caribou frequented the mine site and adjacent areas when there was a healthy herd. Moreover, the road cuts across a significant area of mature forests that the caribou would need to access. Finally, the mine site itself contains, not only mature trees, but a good deal of second growth which has not yet, but is about to reach an age that will support arboreal lichen. (WMIOV, LV, p.2; WMIOV, MH, Site Forestry Map)

So, it's not a surprise that there are no caribou using the area currently. The herd is way below its normal numbers, much of the habitat at the mine site is not quite at the stage where it would provide food (LV, p.2) and the road area was not even taken into account by Telkwa Coal in its study.

As to the higher elevation habitat in the WHA, radio data establishes that the caribou frequently use a ridge top area near Hunters Basin called the "Camel Humps." (WMIOV, LV, p.2) This provides important habitat for caribou calf rearing. (WMIOV, LV, p.2) The "Camel Humps" is only 7 kilometres up from and in line of sight to the mine location. (WMIOV, LV, p.2; WMIOV, MH Line of Sight Map) So, what do you think will happen when Telkwa Coal starts digging and blasting away down below? Where is the noise likely to go? What impact will it have on the caribou?

As noted, caribou flee disturbance, so the answers to these questions are pretty obvious. Yet, despite the fact that this issue has been repeatedly pointed out to both Telkwa Coal and the Province, no one has bothered to make an acoustical analysis of the likely impacts of noise on the caribou in this area.

In summary, the mine will impact a large area of critical caribou habitat within the Telkwa Caribou WHA and will likely force caribou to flee an important calf rearing area. Yet, at no point has Telkwa Coal treated this issue seriously. Instead they pretended to study it by looking at the mine site during a two year period when, predictably, a depleted herd was not using it.

The Telkwa Mountains Caribou Population Unit area is already well beyond the federal disturbance standards measuring percentage of disturbance that should be allowed where there is a threatened herd. Now, Telkwa Coal wants to vastly extend those areas of disturbance and justifies its actions based on a pretend study that even they must know is inadequate.

Acton Items:

1. Require federal-provincial coordination with Telkwa Coal to address how to achieve sufficient habitat supply (not exceeding the acceptable level of habitat disturbance for the Telkwa Caribou Population Unit) and that takes into account federal regulations on disturbed habitat for protecting a threatened caribou herd;

2. Require adequate acoustical studies to determine the disturbance area resulting from mine blasting and other noise, including in the Camel Humps;

3. Require a study identifying likely impacts of the mine based on Telkwa Caribou population recovery objectives (150 caribou), on historical use of the area by caribou and taking into account the removal of second growth and the consequent delaying of forest maturation and growth of arboreal lichen, the impacts of the mine road, acoustic displacement and the full range of cumulative effects using original conditions as the baseline and not current conditions.

4. Climate Matters

If anyone in the world should be aware of the costs associated with climate change due to the release of greenhouse gases by human activity, it is us here In BC. We have already started to experience the kinds of climate change induced disasters that will only worsen over time. From forest fires to floods to heat waves, it's already costing us lives and billions in losses.

Yet, Telkwa Coal in its mine application has failed to take into account any of these costs, either through the direct amount of greenhouse gases released by its production activities or by the indirect impacts of GHGs produced when its product is burned.

Telkwa Coal claims that it will be selling metallurgical coal and that, at least implicitly this makes its product less objectionable than if the coal was to be burned for electricity. The reality is that, whether used for power generation or making steel, the amount of greenhouse gases that are released is almost identical.

There is a very real cost to these emissions.

According to Telkwa Coal, direct releases of greenhouse gasses from its production activities will total 68,973 tonnes per year for the 22 years of the planned operations. This is a serious understatement because it undercounts methane emissions by a factor of 5 (actually, at first Telkwa Coal denied that there would be any such emissions at all). (WMIOV, Lebiadowski, p.5 reports 4600 tonnes of methane per year whereas Telkwa Coal reports 897 –ELAW, Chernaik, p.2). Taking into account a more realistic projection, total direct ghg emissions in CO2 equivalents will be 139,000 tonnes per yr.

Even this limited number will take a substantial toll. For example, recent studies indicate that this amount of ghgs will end up causing, depending on how quickly we act to limit temperature increases, somewhere between 166 and 343 lives by 2100. (RLAW, Chernaik, p. 5)

All of this pales in comparison to total emissions and impacts if we take into account the ghgs released when the coal is burned. These indirect emissions will total 2.33 million metric tonnes per year. (ELAW,

Wendling, p.3) Deaths associated with this kind of result are, again depending on how fast we act to limit climate change, between 5,434 and 11,220 over the life of the mine. (ELAW, Chernaik, pp. 4-5)

The economic costs are perhaps even more daunting. These amounts of ghg emissions, taking into account the true costs of climate change to the economy will result in a staggering up to $7.7 billion per year in losses and $170 billion over the 22 years of operation. (ELAW, Wendling, p. 3)

Action Items:

To fulfill its responsibility to assess GHG impacts, the EAO should require Telkwa Coal to report on both direct and indirect emissions from its project, including from the burning of the coal by end users.

Such a report should include estimates of total costs based on the impacts on climate from these emissions, including the number of lives that are likely to be lost due to climate change arising from these ghg releases.

Telkwa Coal should revise its methane release estimates to accurately reflect the actual amounts that are likely to be produced by its operations.

Without such studies, a true cost/benefit analysis for the project cannot be performed.

5. Air Matters[1]

Coal mining is a dirty business. It creates a lot of dust. At the Open House, Telkwa Coal admitted that its mine will produce a significant amount of air pollution, mostly in the form of particulate matter. Other materials include pollution from the explosives and toxins thrown into the air from the soil and rock by blasting. This will add a not insubstantial amount of these materials to our already overburdened air shed.

Telkwa Coal's response? Not to worry. Your air in the Valley already exceeds Provincial guidelines for particulate matter, so there will be no additional "exceedance".

Are they kidding? Your air is bad so you don't have to worry if we make it worse? Particulate matter is bad for human health. It causes respiratory diseases; it worsens asthma and heart conditions. It results in deaths. (See literature review on coal mine health impacts attached)

While Telkwa Coal indicated that it would release enough Particulate matter to have a not insignificant impact on our air (at least 3% above the already elevated numbers), it did not report a detailed analysis of what will be contained in this material. Toxins such as mercury and other heavy metals are identified as present in the water impacts section, but not discussed when it comes to air. Mercury is a powerful neuro-toxin and it is easily mobilized at temperatures that will occur where blasting is taking place. (WMIOV, D. Stevens, AQ Report). Coal dust by itself has significant adverse health impacts.

[1] *We have not received reports from accredited experts on Air and Noise. This and the following section are based on information provided by Telkwa Coal at the EAO Open House on 6/1/2022, from a local air shed adviser and on general knowledge of the subject matter.*

So, maybe we do need to worry.

Moreover, we did not see a study that identifies how the air pollution from the mine will spread around the Valley. (WMIOV, D. Stevens, AQ Report).

Coal dust is highly transportable. Wind and other atmospheric conditions will move it considerable distances. The prevailing winds in the Valley in periods of high pressure are from south to north. How much of the dust will land on residences in Smithers and Telkwa? How much will reach the downhill ski area and blacken the snow? What impact will that have on the ski hill's business?

In the Elk Valley, the coal and rock dust from the Teck mines has these effects. (R. Macnair Presentation 2022-4-19 - available at:
https://vimeo.com/709917734?embedded=true&source=vimeo_logo&owner=175012571

Why wouldn't it here?

Similarly, what happens to dust at the coal loadout? How will it affect nearby residents? Coal trucking and storage areas are known to be significant sources of dust pollution:
(https://pubmed.ncbi.nlm.nih.gov/27731783/)

Yet, Telkwa Coal's mine plan contains none of this information. Precisely this kind of information was required during the EA process for the Manalta Coal Proposal in the 1990s. (Draft Project Report Specifications, Manalta Coal Proposal, p.p. 66-67)

Action Items:
Telkwa Coal should conduct a thorough study examining how dust and other materials will travel around the Valley as the result of its operations, including coal stockpiling and loading and unloading at the loadout This study should include all inhabited areas Quick to Smithers as identified in the Manalta Report Specifications.

The study should include the full range of materials that will be released into the air.

The study should estimate negative health impacts and their costs in terms of both disease and economic consequences.

The study should determine the economic losses that will occur due to loss of tourism and loss in real estate values resulting from lower demand induced by polluted air.

7. Noise Matters

Similarly to air, Telkwa Coal did not perform a comprehensive study about the impacts on the Valley from noise created by their operations. According to a survey performed by the Regional District in 2012, the most important factor (77.3% chose this) for deciding to live in rural areas in the Valley is the quiet environment. (RD Survey, 12-2012, p.10) This also draws newcomers to the Valley.

Telkwa Coal will be blasting. That's how you dig an open pit mine.

It will create noise. Noise generally travels upward and outward. It reverberates off hillsides. It travels with the wind and is impacted by other atmospheric conditions.

So how far and where will it travel? At the Open House, Telkwa Coal presented a poster that reported that, based on its modelling, the noise form the mine area will not travel more than 3-4 kms. down the Telkwa River valley and that it won't reach the town of Telkwa in significant amounts (i.e. amounts that exceed provincial guidelines).

According to that poster, this modelling was essentially linear and focused on an area that is downhill from the mine pit.

But, this is not how noise travels. We know that Telkwa Coal did not bother to study the noise impacts on the Camel Humps ridge just above the mine. So, apparently they did not think that this type of modelling was important.

But, we know from the sound from the railroad and other industrial operations in the Valley that noise can travel far more than 3-4 kms. And this involves noise impacts that are far less severe than blasts from explosives. How will noise impact the ski operations on Hudson Bay Mountain which is only about 10 kms. away from the mine? How will it impact sales of properties in the new ski hill cabin area? How will it impact our property values?

Speaking of the railroad, how will the noise at the rail load out impact local residents? This noise will come not just from the rail cars, but other equipment used for hauling, dumping and loading the coal. Telkwa Coal said at the Open House on June 1, 2022, that it would mitigate these impacts by asking the operators to run the trains slowly. (Open House, 6-1-2022, AG) We know from long experience that the loudest noises from the trains are not based on speed, but from the shuttling of cars in railway yards.

Noise pollution can have significant economic and even health impacts (ELAW, Niemi, p.11) It can reduce real estate values, it can induce stress, it can deter amenity migration which is one of the major economic drivers in the Valley and it can drive away tourists. These costs need to be measured to understand the true impacts of this proposal.

Action items:

Require a study that identifies how noise will travel around the Valley. This study should include the impacts of noise on residents near the railroad load out

Identify the economic costs of noise pollution from the mine, including to real estate values, the ski hill and cabin sales at the ski area.

8. Views Matters

Notwithstanding all of the above, the only "Valued Component" that Telkwa Coal acknowledges it will have a substantial impact on is visual quality. Even here, Telkwa Coal dismissed this concern as unimportant due to the significant amount of disturbance to the natural scenery that has already occurred caused as a result of forestry activities.

Yet, visual quality can have substantial impacts. We know that one of the factors that drive real estate values here, for instance is "Mountain Views." The Telkwa Coal operation will have a substantial visual

footprint and impact these views (WMIOV, MH, visual modelling, Hudson Bay Mountain Ski Area and Telkwa High Rd. at Babine Lake Rd attached).

Moreover, the area around the proposed mine site is undeveloped and, currently, adds no light pollution to the Valley. If the mine opens, it will require a significant amount of illumination for evening, nighttime and early morning operations. As can be seen from the examples of visual impact modelling we have provided, this amount of light pollution will be visible from many areas in the Valley and it will occur against an area that is otherwise dark.

Also, we noticed a reference to flaring in the air quality section of the mine plan. It was unexplained. But, if Telkwa Coal has a plan to implement flaring, it needs to tell us about it and what its purpose is. This will not only greatly impact light and visual quality issues, but might also have a substantial effect on air pollution.

Action items

Provide realistic models demonstrating likely visual quality impacts on the Valley (the photo displayed at the Open House, for instance showed a scene that was from a view point close to the intersection of Telkwa High Rd. and Babine Lake Rd. taken on a murky day against a back lit sky - so, it shows very little about what the impact on this scene would be like.)

Perform a study that depicts the impact on the nighttime scenery in the Valley during construction and operations of the mine;

Identify potential losses in real estate values that will occur due to impairment of visual quality resulting from the mine;

Include in both the visual quality and air quality sections of the Mine Plan an explanation of the reference to flaring contained in the Mine Plan and the impacts of such an activity.

9. Size Matters

When Telkwa Coal first showed up in this area in 2017, they tried to sell their idea to the public based on this the claim that this would be only a very small mine – 250,000 tonnes per year (tpa). Conveniently enough, just under the Provincial threshold for an environmental review.

When Telkwa Coal found out that this was not going to fly, the mine proposal suddenly became 750,000-825,000 tpa. Their current mine application to the Environmental Assessment Office is based on the 750,000 amount.

But, this is not where it is going to end. While saying one thing for purposes of the Environmental Assessment, they tell their investors and the rest of the business community that they plan to "ramp-up" to almost twice this number – 1,350,000 tpa by the fourth year. They also say they have plans to open two more pits, each closer to the river and the town of Telkwa.

Given the ever increasing size of this project, one might also want to consider that the coal bed here lies beneath almost the entire Valley, stretching north to beyond Smithers and east to the edge of the Babine Mountains. Where will this stop once it gets a foot in the door?

Yet, the Environmental Assessment process is based on the 750,000 tpa figure. The rationale – if Telkwa Coal wants to expand they will need to apply for an amendment to their Environmental Certificate. But, amendments are almost never denied and do not require a full review.

Does size matter? Sure it does.

While Telkwa Coal told us at the Open House that it was expecting to exceed Provincial Guidelines on the release of selenium and other pollutants by "only" up to 4 times, it buried in its mine application the fact that they want waivers of the guidelines by up to 25 times.

While Telkwa Coal said its water usage would only be relatively modest, it buried in its application the fact that it was looking for a contingency that allowed it to use 9 times its stated target.

While Telkwa Coal was selling its waste impoundment plan based on the 750,000 tonnes per year figure, it has been planning all along to expand its operations by 80%. Even at the lower number it acknowledges that its plans pose a very high potential of significant consequences putting lives at stake.

So, what happens when they "ramp-up"? Does this mean they need waivers on water quality guidelines by up to 45 times and not 25?

Does this mean that their water usage will not be just 9 times their stated primary amount, but 16?

Does this mean that their GHG emissions will be 80% higher than estimated?

These impacts can be expected to extend to all other Value Component considerations including to fish, water quality, water flow, air and noise impacts.

Action Items:

If the Environmental Assessment is approved, it should be expressly conditioned on the current size of the project as identified in the mine plan. Any subsequent increases in size should require a full new Assessment and Certificate, rather than an amendment.

Alternatively, the mine's impacts should be assessed based on its likely highest level of impacts, including what will occur after "ramp-up." Otherwise, the assessment will significantly under estimate the consequences of this mine.

10. Economic Matters

To get approval of its application, Telkwa Coal has to establish a "Net Positive Value" for its project. To do so, they are supposed to measure the presumed benefits against the costs, including the wider costs and benefits to the community and society as a whole.

Instead, Telkwa Coal weighed only its own costs against what it deemed to be the likely returns to it and the government entities that would receive revenue. (NWI, Joseph. p. i). This form of modelling, even if done accurately, is inconsistent with modern practices and provides limited useful information (NWI, Joseph, p. i)

Instead, Telkwa Coal's analysis should have taken into account all social costs to the surrounding communities and governments, and not just the costs to itself. These factors include costs to government

infrastructure, economic damage to local communities, health impacts and associated costs to the medical care system and the costs associated with greenhouse gas emissions and climate change.

Even leaving aside for the moment the inherent limitations in Telkwa Coal's methodology, it is evident that its analysis was deeply flawed. In fact, amazingly, it did not do a feasibility study at all. (NWI, Thompson, p. 3)

This has led to significant mistakes in its planning. In doing so, it relied on major input cost estimates such as diesel fuel and wage rates that are out of date and unrealistic. As examples, it assumed diesel prices (overall more than 8% of its total costs) at the 2019 level. (NWI, Thompson, p.2) One could only wish for that. It assumed wage costs at 30-40% below Provincial averages for coal mining (NWI, Thompson, p.p. 7-8).

Overall, its assumptions underestimate its costs by around 500% for construction and 430% for operations. (NWI, Joseph, p. 7)

Conversely, on the income side, Telkwa Coal did not provide a sound analysis of the likely price it will receive for its product. (NWI, Thompson, p. 3; NWI, Joseph, p.p. 8-9) To conclude that the mine has some potential to be profitable, one must use unrealistic projections for the price of coal. Under most scenarios, the mine will lose money. (NWI, Joseph, p.p. 21-22). And even under scenarios that would result in a profit, most such models depend on the price of coal rising by 25% over the life of the mine. (NWI, Joseph, p. 23)

The likelihood of this happening is slim to none. Both British Petroleum and the International Energy Agency provide assessments of the future path of coal prices. Both indicate that the market for coal, including metallurgical coal will start shrinking rapidly by 2030. (NWI, Joseph, p.p. 9-10). Much of this loss of market will take place because the steel industry is shifting away from using coal in its production process to limit its own ghg emissions. Thus, within 5 years after this project gets off the ground, the bottom will fall out of Telkwa Coal's market because its product will no longer be in demand.

Why is this important? Isn't the question of whether or not the proponent will make any money their look out and not ours?

The answer to this is no. The economic case for the proposal is one of the core questions that the EAO must look at.

The assumptions about economic benefits to the Province and the workforce all depend on claims about the supposed life of the mine. For example, Telkwa Coal projects (and even this is without explanation) $368 million dollars in tax and other revenues to the Province and other government entities over the projected mine life of around 21 years (NWI, Joseph, p. 13). Similarly, its claims of total wages that will be paid also assume that lifespan.

If the viability of the mine is instead 5 years at best, then what happens to those projections and the claims that the project has a Net Project Value?

Even worse, if the life of the mine is cut short because it becomes economically untenable, who will pay for all of the legacy costs? Remember, the mine containment areas must be maintained essentially

forever. Even under the best of circumstances the mine dams pose a serious threat to human life. If they are not maintained, what happens?

The mine site reclamation project is also quite expensive. (NWI, Joseph, p. 14) If Telkwa Coal gives up after just a few years, will they have the resources to absorb these costs? This is a junior mining firm without deep pockets. Does anyone seriously think they will stick around to meet these costs once they have to close down because they are not making any money?

And these considerations grow out of just the limited assessment of the direct costs and revenues. If you start looking at the wider costs, the picture becomes even more troubling.

As noted, Telkwa Coal ignored all the direct local costs to everyone but themselves. These costs can be substantial and include:

1. Road use;

2. Health care;

3. Accidents;

4. Emergency services;

5. Education;

6. Environmental impacts

If a dam fails, all of these costs increase astronomically.

Then there are the greenhouse gas emissions, both local (direct) and outside the area (indirect). Telkwa Coal made no serious effort to estimate these. Their direct GHG analysis ignored emissions form diesel and transportation (NWI, Joseph, p. 14). Their methane emissions were understated by a factor of 5. (ELAW, Chernaik, p. 2; WMIOV, Lebiadowski, p. 5)

But the real elephant in the room is the ghg emissions from the end users of the product. Those are enormous and will amount to $29-170 billion (US) (depending on whether one bases the estimates on the consequences that flow from limiting temperature increases to 2.4 degrees C or 4.1) (ELAW, Niemi p. 3) Translated into mortality terms, given the various potential paths for climate change, the costs in human lives worldwide would be 11,000-60,000deaths (ELAW, Chernaik, p. 5).

Taking all of these factors into account, regardless of whether the analysis is limited to cost inputs and outputs or to a real cost/benefit analysis including all social costs, the mine is likely to be a loser. So, why risk our fish, our rivers, our air and our quality of life on this futile endeavour?

Action Items:

1. Require a realistic assessment of input costs based on current prices for labour, machinery, fuel and all other materials and services:

2. Require a realistic assessment of output revenue based on internationally accepted forecasts for coal prices and taking into account likely changes in market conditions due to the switch away from coal in the steel making industry;

3. Require a full assessment of all costs to the local communities, population, businesses and government institutions, including the costs of health care due to the operation of the proposed mine;

3. Based on the above, require a new assessment of benefits in the form of government revenue, wages and other payments from mine proceeds taking into account a reasonable assessment of the mine's economic viability;

4. After assessing a realistic input/output analysis for the mine, include a full cost/benefits analysis including taking into account the full GHG and climate change costs both direct and indirect that will occur due to the operation of the mine and the use of its product

Without the above, the EAO will not be able to accurately assess the Net Project Value for the proposal.

11. Public Hearing Process

Up to now, the only information that the public has received about this project through the Environmental Assessment process has come from Telkwa Coal. The Open Houses held by the Environmental Assessment Office provided no opportunity to publicly raise informed questions about this project or to learn about its risks. Rather, the Open Houses seemed designed to simply put the government's apparent stamp of approval on the information that the proponent was disseminating. As we note, that information is highly unreliable and misleading.

This is a project that poses a risk not only to the rivers and the fish and our quality of life, but puts human life and safety at stake.

Under these circumstances, we need a public hearing where these issues can be thoroughly raised and discussed so that everyone has a full appreciation of the risks and benefits before an approval is issued. The EAO has the authority under Sec. 13 to modify its Section 11 Procedure Order to provide for such a public hearing process. Our Valley is too important to us to allow this to go forward without a chance for the public to know what the true consequences are.

Action Item:

The EAO should direct that a public hearing take place to be held after all information is received, but before any Certificate is issued.