EARTHWORKS

February 19, 2016

Tom Livers, Director
Montana DEQ
1520 E. 6th Avenue
Helena, MT 59620-0901

Dear Tom,

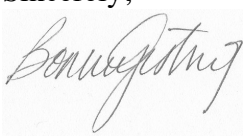
Thank you for the opportunity to submit comments for consideration on the completeness review of the permit application submitted by Tintina for the Black Butte Project on December 15, 2015.

State law and regulations outline the information that applicants must submit to the Montana Department of Environmental Quality (DEQ) in its permit application (82-4-335(5) MCA). There are sections of the mine plan, baseline data and technical review that are missing, incomplete or under revision. These gaps have significant implication for the design, construction and management of the proposed mine, and the resources at risk. The comments below include:

- a list of missing documents/information identified in the permit application,
- a summary of the primary inadequacies, and
- a section by section review of issues.

We also incorporate by reference the comments by technical experts Tom Myers, Dave Chambers, Jim Kuipers, Kendra Zamzow, and Ken Knudson, submitted by Montana Trout Unlimited. The Smith River is an unparalleled resource that deserves the most rigorous review. We appreciate DEQ's thorough attention to this project.

Sincerely,



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Missing Documents/Materials:

- **Major Facility Siting**: Alternatives Analysis for Siting of Major Facilities is pending.

- **Spill Response Plan**: Appendix P, which outlines the company's emergency response plan, is under revision.

- **Weed Mitigation and Management Plan**: Appendix O, which outlines Tintina's weed plan, is under revision.

- **Dam Breach Inundation Study**: According to Appendix K (p. 41), this study will be completed as part of future design phases, if required.

- **Wetlands**: "Tintina is currently working with the USACE on developing a jurisdictional determination for the project area, but it isn't available." (P. 56)

- **Water Quality**: "Predictive models of water quality in the underground workings during operations and at closure, on the waste rock stockpile, and in the tailings impoundment sump are also being developed and will be reported at a later time." (P. 68)

- **Tailings**: The tests to determine metal release for saturated tailings remain online and "all interpretation is subject to change based on future results." (p. 71)

- **Waste Rock**: The tests to determine metal release from waste rock aren't complete: "Some of these tests are ongoing and, therefore, interpretation is subject to change" (p. 67)

- **Construction Rock**: No testing results are presented for granodiorite construction rock. According to the permit application, "These tests were initiated subsequent to determination of final facility locations in October 2015, and results will be available at a later time." (P. 63)

- **Aquatic Life**: Only one year of baseline data has been completed for fish and other aquatic life. (P. 85)

- **Air Quality**: No baseline data has been provided. (P. 25-26)

- **Storm Water Management**: Storm water pollution prevention plan is pending.

Summary of Inadequate Data, Analysis and Information:

- **Surface Water Monitoring:** The monitoring sites on Sheep Creek and tributaries are too spread out and sampled too infrequently to determine where water enters the creeks and which mine facilities may contribute contaminants to different parts of the stream.

- **Groundwater monitoring and modeling:** The groundwater modeling contains major errors and is insufficient to estimate mine dewatering rates or determine impacts to stream flows. Because the groundwater hydrology is so complex, there aren't enough monitoring wells to provide sufficient information on groundwater flows or quality to determine impacts after mine development.

- **Water treatment:** The water management and treatment plan lacks sufficient detail to determine whether it will adequately manage water pollution.

- **Fish and Aquatic Life:** Baseline data is insufficient to characterize fish and other aquatic life; data collection did not follow appropriate protocols; information was not provided on the value of Sheep Creek as a spawning tributary to the Smith River/Missouri River; habitat surveys are inadequate and missing information. Baseline data for aquatic communities and their habitats ire not included for significant streams put at risk from spills or otherwise affected by hauling of copper concentrate to rail heads, including Deep Creek and the Shields River.

- **Geochemistry of construction rock:** Data is missing to determine whether the rock used for construction (roads, etc.) will result in leaching of contaminants.

- **Geochemistry of waste rock and tailings**: There is insufficient sampling of waste rock to determine the range of seepage water quality; Analysis has not been conducted to determine how long it will take the cement in the cemented paste tailings to degrade, and what the resulting effects could be for groundwater.

- **Mine water disposal:** Data on soils and groundwater hydrology are inadequate to determine whether the Land Application Disposal system and infiltration trenches will effectively dispose of mine water without adverse effects to water quality.

- **Mine waste disposal:** The information and analysis is insufficient to determine whether acid mine drainage and metals leaching from mine waste stored in the tailings facility and underground tunnels will be effectively prevented and/or contained in perpetuity.

- **Mine plan:** Overall the permit application lacks detailed information to demonstrate that the mine plan will work as proposed and contingency measures are in place if it doesn’t.

- **Extent of mining:** Information on the Lowry Deposit and other deposits in the area are

missing, even though the company has made it clear to investors that these deposits are part of its mining plans in the area.

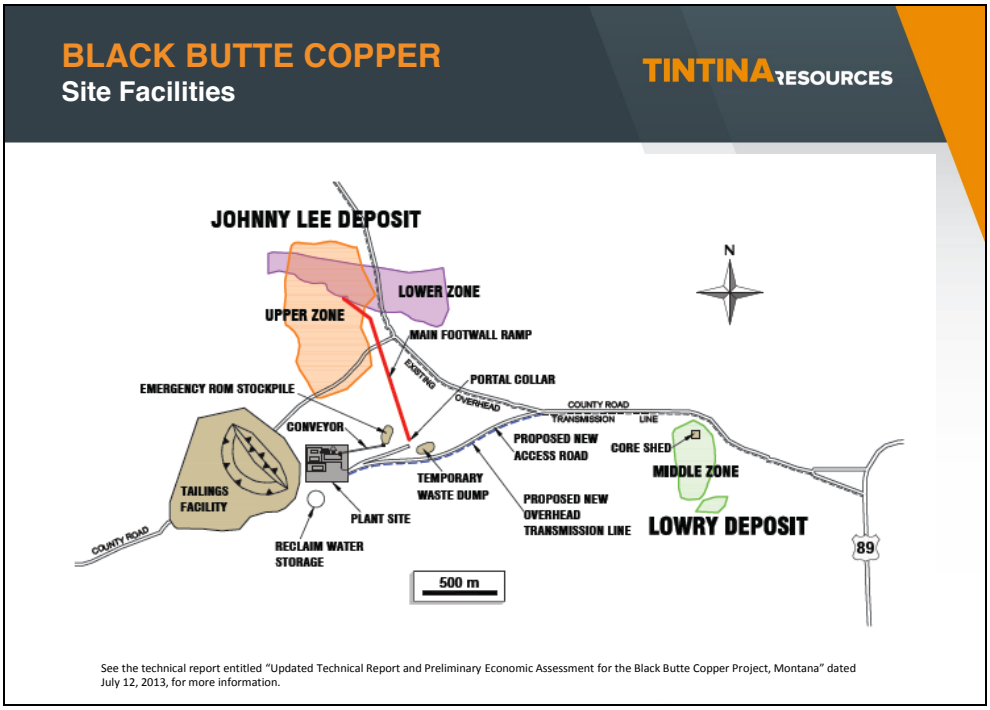
- **Reclamation plan/perpetual care:** Elements are missing (e.g., weed control plan); there is insufficient long-term monitoring, operations and maintenance plan information; information and analysis is missing on how the tailings facility and underground mine waste, and its risk to water resources, will be successfully managed in perpetuity.

- **Water rights**: Detail is needed on all existing ground and surface water right claims in the area as well as points of diversion, and how often these water rights are unmet due to low flows.

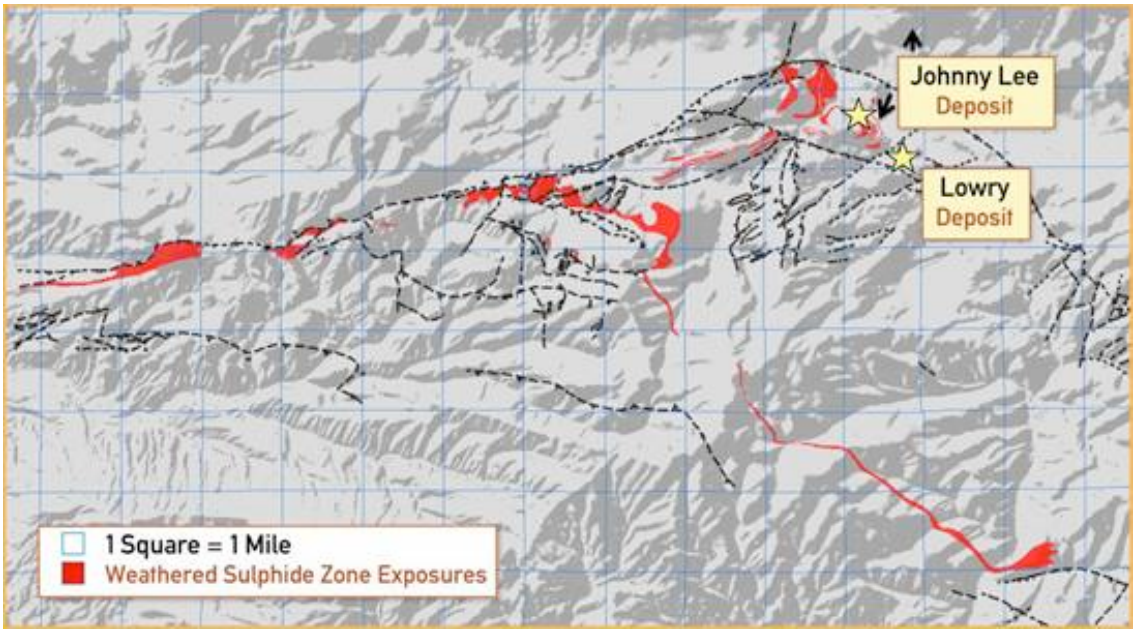
Section 1.0 INTRODUCTION AND PROJECT OVERVIEW

The permit application is missing information on the Lowry Deposit. The company has made it clear to investors that this deposit is part of its mining plans for the area, describing the Lowry Deposit as the middle zone in its project maps:

> "An Updated Technical Report and Preliminary Economic Assessment (PEA) completed by Tintina in July 2013 was based on reported NI 43-101 Measured and Indicated Resources totalling 15.7 million tonnes grading 3.4% Cu, 0.1% Co and 14g/t Ag for 533,600 tonnes of contained copper and Inferred Resources totalling 2.3 million tonnes grading 2.8% Cu, 0.09% Co and 14g/t Ag for 63,500 tonnes of contained copper (calculated using a 1.6% copper cut-off grade) for the Johnny Lee Upper Zone ***and Lowry deposits***, and a 1.5% Cu cut-off for the Johnny Lee Lower Zone)." (http://www.asx.com.au/asxpdf/20140828/pdf/42rtdz1lfbphx2.pdf)



Section 1 should include information about the Lowry deposit and a description of the large-scale mineral system, as identified in this map (below) from Tintina, which the company identifies as the district-wide potential to extend mine life and establish a 50-year district. Maps and descriptions should be provided that identify Tintina's land and mineral holdings related to the mining district. See: http://www.tintinaresources.com/assets/docs/ppt/corporate-presentation.pdf



SECTION 2.0 EXISTING CONDITIONS AND BASELINE STUDIES

17.24.116 ARM requires that an operating permit application provide sufficient information to describe the existing environment. The permit application is replete with missing and inadequate baseline data, including the following:

2.1 Air Quality

The permit application is missing baseline data on air quality. It should also provide a list of all stationary emissions sources as part of the permit application.

2.2 Water Resources

Surface Water Quality Monitoring: The baseline data for surface water quality has been conducted on a quarterly basis for most sites, which is inadequate to characterize these resources. Quarterly monitoring is far too infrequent to provide adequate baseline data to characterize variability throughout the year and between years.

The permit application contains too few surface water monitoring sites to provide adequate baseline data on all surface water resources, and to identify impacts if they occur as a result of operations. It appears that there is only one surface water monitoring site (SW1) in Sheep Creek downstream of the mine, and it is more than a mile downstream from the project boundary. Furthermore, there are numerous tributaries that enter Sheep Creek between SW1 and SW2 (upstream of the mine), which will make it difficult to determine the source of any leaks, seepage or alterations in flows. Additional monitoring stations are needed between SW2 and SW1 in the vicinity of the mine to accurately characterize water quality and stream flows in that reach of Sheep Creek, and in order to provide baseline data upon which to determine future potential

impacts (e.g., spills, flow alteration, etc.).

Similarly, one surface water monitoring site downstream of the mine (SW1) is insufficient to characterize stream conditions that could be affected by a spill or tailings failure. Additional downstream monitoring stations are necessary for baseline data and monitoring.

The water resource monitoring sites in Figure 2.2 are difficult to see. Another map should be provided that clearly identifies the location of each monitoring site, mine facility and the relevant water body.

Streamflow data: Additional baseline monitoring and analysis are needed to accurately characterize flows between SW-2 and SW-1. Appendix B states that the increase in streamflow in Sheep Creek between SW-2 and SW1 during baseflow periods appears to be attributable to groundwater and or inflow from unmonitored springs and tributaries on Castle Mountain property to the north of Sheep Creek. (P. 2-8 of Appendix B). More certainty is necessary to determine effects of the proposed project.

As recommended by Montana's Department of Fish Wildlife and Parks in its 2013 comments on the Environmental Assessment of the proposed exploration decline, Tintina should install a USGS real-time discharge gage with seasonal thermal recording near the site SW-1. Independent flow data gathered by USGS should be used to establish correlations to help determine if changes in the fishery are due to mine related impacts on stream flow.

Groundwater quality monitoring and modeling: As described by Tom Myers memo, the groundwater modeling contains major errors and is insufficient to estimate mine dewatering rates or determine impacts to stream flows. Because the groundwater hydrology is so complex, there aren't enough monitoring wells to provide sufficient information on groundwater flows or quality to determine impacts after mine development.

Baseline data is missing on groundwater dependent ecosystems (GDE) in Sheep Creek (e.g., hyporheic zones, gaining reaches of streams) that could be adversely affected by groundwater drawdown resulting from mining.

Baseline flow data for springs and seeps is insufficient to demonstrate annual variability. Data has only been collected annually, and baseline water quality data is missing for some springs and seeps. Table 6 of Appendix B indicates that there are 10 springs, but the narrative states that water samples for water quality have only been collected at 5 of the springs. Table 1 indicates that water quality and flow data is missing for seeps.

Water Rights: The permit application should provide data on existing surface and groundwater right claims and diversions in the area, and provide information to characterize how often, and at what times, water rights are unmet as a result of low flows.The permit application should also provide information on the location and amount of flows affected by diversions in the mine area.

Baseline Water Quality Data for Transportation Routes: Baseline data is needed to characterize water quality in waterways along the mine's transport routes to analyze the potential effects of

dust/sediment/spills from transportation activities. For example, if Tintina intends to transport its concentrate along Deep Creek Road to Townsend, baseline data is needed for Deep Creek and similarly for the Shields River.

2.3 Wetland Resources

Wetlands jurisdictional determination hasn't been completed. "Tintina is currently working with the USACE on developing a jurisdictional determination for the project area, but it isn't available." (P. 56)

Additional data is needed on groundwater hydrology related to wetlands in the permit area. The application notes that the wetlands near Sheep Creek and Little Sheep Creek are "sub-irrigated" and that the hydrology in wetlands near tributaries to Sheep and Little Sheep Creek are "primarily groundwater driven." This indicates the wetlands tend to be groundwater discharge points. Wetland categories I and II include groundwater recharge/discharge as important uses. The application fails to collect sufficient groundwater data to establish baseline water levels for the wetlands, even though the application acknowledges the importance of groundwater to the wetlands. The annual sampling of field parameters in nine seeps (Table 2-7), which coincide with wetland areas, is not a substitute. In addition to monitoring of the wetlands, groundwater level monitoring in the wetlands would help to assess surface water/groundwater interactions. Without groundwater level data to assess gradients, the discussion regarding groundwater discharge to the streams (p 52 & 53) is mere speculation. The application should include sufficient shallow groundwater monitoring wells within the wetlands to assess natural groundwater level variability. Monitoring points should be established on a grid throughout the wetland zone. Figure 2.9 shows that wetlands along Sheep Creek were assessed only within the project boundary. The survey misses obvious wetlands along a very meandering section of Sheep Creek just north of the primary access road to the project area.

2.4 Environmental Geochemistry

Missing and incomplete information on waste rock (Section 2.4.2):

According to the permit application (Section 2.4.2.2), kinetic tests of waste rock acid generation and metal release potential are currently underway at McClelland Laboratories (Sparks NV), following ASTM protocol D5744 for humidity cell tests (HCTs). The permit application states that "some of these tests are ongoing and, therefore, interpretation is subject to change." (P. 67) These test results need to be continued until a stead state geochemical condition has been realized, and the data provided in the permit application. The permit application isn't complete without this data because it has implications for long-term water management and treatment.

2015 humidity cell testing for Ynl lithology is not presented. It could be used as construction material and therefore has the potential to impact surface water.

The SPLP tests conducted in 2012 – including ones on Ynl that produced exceedances of aluminum and selenium – were determined to be inaccurate (Appendix D, Section 3.1.3). If SPLP tests cannot be used to determine potential leachate from Ynl as construction rock, the

permit application should provide details on what tests will be done to make that determination. If Ynl as a unit contains very different types of minerals, the permit application should describe how material be sorted to use only that with minimal impacts.

No testing results are presented for granodiorite construction rock. According to the permit application, "These tests were initiated subsequent to determination of final facility locations in October 2015, and results will be available at a later time." (P. 63) Granodiorite is commonly used for road building, however since it is found in this mineralized zone, it would be appropriate to know if there are intrusions of minerals that could leach. A single SPLP test is ongoing for granodiorite. These results need to be provided in the permit application before it can be deemed complete.

According to the permit application, "Predictive models of water quality in the underground workings during operations and at closure, on the waste rock stockpile, and in the tailings impoundment sump are also being developed and will be reported at a later time." (Section 2.4.2.2 P. 68) This modeling data is needed to determine water treatment and mitigation measures, and therefore needs to be provided now. It also appears possible that no tests were conducted on the middle or lower sulfide zones (MSZ, LSZ).

Missing and incomplete information on tailings (Section 2.4.3):

According to the permit application, "Kinetic tests of raw (non-amended) tailings and cemented paste tailings tests are ongoing…" (p. 70) The tests to determine metal release for saturated tailings remain online and "all interpretation is subject to change based on future results." (p. 71) These tests should be finalized and submitted as part of the permit application, and the permit application shouldn't be deemed complete until this data has been provided.

No "diffusion" tests were conducted for 2% cemented tails, and no humidity cell testing was presented for cemented tailings binders with cement <2%, although Tintina states they intend to use 0.5% - 2% cement binder. These tests should be completed and presented as part of the permit application.

Humidity cell testing does not capture the range of material in lithological units. Most of the lithological unit designations (Ynl, Ynla, Ynlb, USZ, LZ-FW, etc.) consist of variable material, including dolomite and pyrite. Setting up only 1-2 HCT tests for each is likely not going to provide a full representation of the potential water quality of seepage in tunnels or stockpiles.

Variability can also be observed in tests conducted on the same lithological unit in different years. Hence, more testing is needed to identify variability in different years.

Missing and inadequate information and analysis on cemented paste (Section 2.4.4):

Additional information is needed in the permit application to properly assess the potential for groundwater transport of metals, acid and other contaminants as the cement in the backfilled tunnels degrades over time.

Detailed information is needed on the degradation rates of cement and binding materials due to

internal sulphate attack and other possible degradation mechanisms. Information and analysis should be provided on the potential range of alternative binder types and dosage, and how they compare to those presented in the permit application.
(See: http://www.eng.uwo.ca/grc/pdfs/groundwater_remediation/review.pdf)(See http://www.sciencedirect.com/science/article/pii/S0958946509000183)

The presence of different elements such as ammonium, sulphates and metals in the water has been shown to negatively affect the cement paste curing process. Detailed information is needed on the quality of process water used in tailings production.

Detailed information should be provided on how the cement tailings deposition, dewatering and management will respond to cold climates, which has been identified as an issue in the scientific literature, and how this will be managed.
(See: https://pure.ltu.se/portal/files/43755253/Literature_Review_on_Potential_Geochemical_and_Geotechnical_Effects_of_Adopting_Paste_Technology_under_Cold_Climate_Conditions.pdf)

Long term analysis on the impacts to surface and groundwater quality related to the use of paste backfill has been identified as a limit in recent literature reviews on cement paste tailings. (See https://pure.ltu.se/portal/files/43755253/Literature_Review_on_Potential_Geochemical_and_Geotechnical_Effects_of_Adopting_Paste_Technology_under_Cold_Climate_Conditions.pdf). Additional information is needed on the scope of mines where cement paste technology has been used for surface and subsurface waste disposal, and the extent of long-term data related to surface and groundwater quality.

2.5 Soil Resources

Additional soil mapping is needed to cover the entire area intended for Land Application Disposal (LAD). As demonstrated by the technical memo by Dave Chambers, only approximately 1⁄4 of that area is presently mapped.

2.6 Terrestrial Wildlife Resources

82-4-301(2) MCA recognizes that metal mining could potentially affect biological resources, and that reclamation specifications must vary accordingly. ARM 17.24.116(3)(a) requires that an operating permit application must include "a description of the existing environment." ARM 17.24.116(3)(u) states that an operating permit application must include "the protective measures designed to avoid foreseeable situations of unnecessary damage to flora and fauna in or adjacent to the area." The Montana Environmental Policy Act (MEPA; 75-1 MCA) provides for an environmental review of a proposed project, including biological resources.

Inadequate baseline data. According to the permit application, only one year (four seasons) of baseline data were collected, and fieldwork was done irregularly. Appendix F states that, "Field work was conducted irregularly from late August 2014 through early August 2015, with most effort expended in April-July 2015." This is inadequate to accurately characterize wildlife resources throughout the year and the variability from one year to the next.

Inadequate methodology. The permit application further states that, "the total number of species

is undoubtedly low because many species are difficult to observe by the methods employed during the evaluation." (Section 2.6.2 P. 82- 84) Additional methods need to be employed to accurately characterize wildlife resources and provide sufficient baseline data.

Missing information on protocols. There is insufficient information in the permit application and appendices on the protocols used in the terrestrial wildlife resources. Appendix C within Appendix K, outlines the wildlife species recorded by habitat type from 2014-2015. No data is given on how many people were involved in these monitoring efforts, their expertise, dates and times of observation, how may field days were involved, and other protocols involved in data collection.

The project area is also too confined to determine whether wildlife adjacent to the project boundary will be adversely affected by noise, traffic, and other operational impacts. The study area must be expanded to provide sufficient baseline data for adjacent populations that could be adversely affected by the project.

Maps should be provided that outline summer and winter range for wildlife in relation to the mine permit boundary and surrounding lands.

2.7 Aquatic Resources

Inadequate baseline data. Only one year of baseline data has been collected for fish, macroinvertebrates, mussels and periphyton (fall of 2014 and the spring and summer of 2015), which is insufficient to characterize these important resources.

Information is missing on the importance of Sheep Creek to the mainstem Smith River, its value as a spawning tributary, and its importance in supporting or sustaining the Smith River and Missouri River trout fisheries as identified by the Montana Department of Fish, Wildlife and Parks in its 2013 letter to DEQ in response to the Environmental Assessment of Tintina's proposed exploration decline:

> "Our most recent fisheries work in this area occurred from 2007 to 2012 and involved three independent studies of trout behavior in the Smith River drainage. We surgically implanted radio transmitters in fish and monitored their movements to identify habitats for spawning, summering and wintering. Our studies have shown 52% of the tagged rainbow trout in the Smith River spawn in the mainstem, and 42% spawn in the tributaries. The sheep creek drainage accounts for 55% of the tributary spawning and includes Sheep Creek proper, Calf Creek and Moose Creek. This discovery demonstrates the importance of Sheep Creek is supporting or sustaining the Smith River and Missouri River trout fisheries."

Deficient monitoring data. There are only two surface water and four aquatic monitoring stations proposed for Sheep Creek, with the furthest downstream "impact" station only about a mile downstream of the mine site. That leaves about 16 miles of Sheep Creek between the mine and the Smith River, as well as the Smith River, unmonitored and without any aquatic or water quality baseline data.

Inadequate habitat analysis. The RBA surveys did not quantify the actual fish habitat that is present in each of the study reaches. More detailed baseline habitat measurements are necessary to allow accurate assessments of changes that would occur to trout macro and microhabitats in the event of a sediment/mine tailings release from the mine.

Appropriate protocols were not followed in fish surveys, as identified by technical comments by fisheries biologist Ken Knudsen.

Transportation Route: Baseline data for aquatic communities and their habitats are not included for significant streams put at risk from spills, sediment, or otherwise affected by hauling of copper concentrate to rail heads, including Deep Creek and the Shields River.

2.8 Vegetation Resources

Baseline data on metal/salt levels in vegetation and soils is needed for proposed Land Application Disposal (LAD) area. The LAD proposal is missing analysis on the potential accumulation of metals/salts in vegetation and soils as a result of long-term wastewater disposal.

2.10 Socio-economic resources

The permit application fails to provide baseline socio-economic data for activities that rely on natural resources, including the value of Sheep Creek and the Smith River for recreation, agriculture and fisheries, etc.

2.12 Transportation Resources

The permit application is missing information on the routes Tintina proposes to use to transport its product to market via highway and rail, an the number and types of trucks that would use these transportation routes.

Baseline data is also needed on the amount and type of traffic for transportation routes potentially used by the mine for transportation of product and transportation routes and for mine workers.

2.13 Land Use

The permit application is too narrowly focused on the land use within the permit boundary, and fails to provide information on land use that could be affected by the proposed project. It is also missing information on Tintina's mining claims on federal lands in the mine vicinity.

SECTION 3.0 OPERATING PLAN

There is inadequate detail in the operating plan to determine whether the plan will work as predicted, and that contingency measures are in place if they don't.

3.2 Underground mine operations and mining methods

Mine dewatering. According to the permit application, Tintina is proposing the use of grouting to reduce or minimize the potential for reductions in streamflow in Coon Creek from the access decline, which will pass approximately 90 feet below the stream.

> "The initial mine access decline will pass approximately 90 feet (27.4 m) below the Coon Creek tributary of Sheep Creek, approximately 1,700 feet (518 m) in from the portal (Figure 1.3). This is the closest proximity of the decline to the surface once beyond the portal. Shallow bedrock test well PW-3 (located along the decline trend adjacent to Coon Creek (Figure 2.2), encountered minimal groundwater in its upper 75 feet (23 m), suggesting that dewatering of the deeper decline will have minimal impact on Coon Creek flow. Grouting of any water producing fracture zones encountered at the decline level in the area underlying the creek will minimize the potential for inflow into the underground workings and reduce or eliminate the potential for any reduction of surface water flow in Coon Creek." (P. 121)

More detail is needed on the use of grouting to control inflow in underground mine operations. Information should be provided on the type of grouting proposed, its effectiveness over time, and its track record at other similar operations.

More information is also needed on the accuracy of modeling predictions at other Montana mines with respect to hydrologic impacts from underground excavations and/or groundwater pumping (e.g., Drumlummon, Troy, Stillwater, etc.)

3.3 Mineral Production

MCA 82-4-335(5)(a-n) requires the permit application to include the minerals expected to be mined, an evaluation of the expected life of any tailings impoundment or waste area and the potential for expansion of the tailings impoundment or waste site, and within limits of normal operating procedures of the industry, for completion of the operation. There is a reasonable potential for the tailings impoundment and/or waste site to be used for waste storage from the Lowry Deposit as described by the information provided to the company's investors about its plans for mining in the area. This information should be included in the permit application. (http://www.asx.com.au/asxpdf/20140828/pdf/42rtdz1lfbphx2.pdf)

3.4 Mine Site

According to the permit application, "It is anticipated that the CTF cut will extend below the groundwater table and care will need to be taken during design, layout and construction of the foundation drain system to control site drainage." (p. 139)

More detail is needed on how the tailings facility will manage drainage/seepage and accommodate the proposed liner system. The diagrams of the CTF (cross sections) should display groundwater levels relative to the liner system and other features.

3.6 Infrastructure Support and Waste and Water Management Facilities

There is inadequate data in the permit application on backup power. Tintina proposes to have two 1 MW diesel generators on site, although it specifies that approximately 9 to 12 MW will be needed for operations. Details are needed on what operations require power during a prolonged power outage, and how that will be supplied.

The permit application states that, "A traffic impact study will be completed." (p. 154) This information should be incorporated in the application.

3.7 Water Management

According to the permit application, the water treatment plant (WTP) is expected to need to treat 510 gpm, but only two reverse osmosis (RO) units are proposed to be used, with each able to treat 255 gpm (2015 Mining Permit Application, Section 3.7.3.5 and Section 4.2.2). This doesn't appear to leave any room for error. It would appear that the proposed WTP is undersized. More detail is needed on how the proposed water treatment system will address sustained increased flows.

A "vibratory system" is proposed for use in treating RO reject water. Additional information is needed on this technology, and its use and track record in similar treatment systems elsewhere. (Section 3.7.3)

The permit application provides only conceptual drawings of the infiltration trenches, with general statements that the galleries will be no closer than 400 feet to any wetland or surface water. It appears that none of the hydrogeologic data is provided in support of the proposed system, and there doesn't appear to be any data presented to support the suggested bedrock infiltration rates. A final design drawing should be provided as part of the permit application, along with the monitoring well and piezometer data. Furthermore, there is insufficient information or analysis to demonstrate that the water returned to the infiltration trenches will actually report to the streams as intended. More infiltration and percolation rate tests are needed in the infiltration basin area. Tintina should provide sufficient information to demonstrate why the infiltration gallery site was chosen as the company's preferred location.

According to the permit application, "With the exception of Coon Creek, smaller individual streams were not evaluated as the model input parameters are not defined well enough at this scale to verify the model's predictive accuracy at these streams. The model is constructed to provide a conservative analysis of the effects on the area adjacent to the mine as it includes the headwaters of Brush Creek and Coon Creek. Hydrologic investigations conducted in the vicinity of both Brush Creek and Coon Creek suggest the deep bedrock aquifers are not in connection with either of these streams near their headwaters (Hydrometrics, 2013 and Hydrometrics, 2015a). The actual potential for impacts to these reaches will depend on the extent to which they are supported by groundwater flow from the regional bedrock aquifer." Further data is needed in the permit application to identify impacts to area streams from groundwater dewatering.

Land Application Disposal: More detail is needed on the land application disposal system. Tintina asserts that the LAD system was used effectively in 2015, but no data is provided to support this. A detailed map of the final design should be provided along with the location of lysimeters. Data is needed in the permit application on the amount of water that would be lost to evapotranspiration via the Land Application Disposal system.

Long-term waste disposal viability: The application needs to include evidence demonstrating that the design or predicted stability of and seepage from the proposed CTF can be achieved through a post-closure period lasting thousands of years. The application needs to further elaborate on potential seepage from the CTF in terms of overall water balance including water from the underdrain and geonet liner layer, and consider potential breakdown of the liner over time and/or more major construction defects than estimated.

Perpetual care: The application needs to include a discussion on technically feasible options for managing the seepage, RO Brine, etc. from the surface waste disposal facilities in perpetuity. The permit application must also describe in detail how the site will manage leachate, if it occurs, from the underground mine tunnels in perpetuity. Will perpetual care involve institutional controls to prevent future disruption of the CTF, and how will this be managed with the long-term leases associated with the site.

SECTION 4.0 MODELING STUDIES

4.2 Geochemical Modeling

According to the permit application, "Models of facility hydrogeochemical performance are currently being developed; we anticipate completing them during first or early second quarter 2016, following consultation with MT DEQ and when ongoing geochemical test work is complete." P. 272. These models will integrate proposed designs with hydrological, geochemical and water balance data to predict water quality for the Project facilities during operations (year 6 and at closure). There are four models under development.

- Groundwater quality prediction in the underground workings;
- Seepage prediction for temporary waste rock storage, which will be collected in the CWP and treated or used as makeup water in the PWP;
- CTF seepage/runoff water quality, which will ultimately return to the PWP and WTP for release following treatment and discharge to an underground infiltration gallery; and
- Updated and refined water quality data predictions for water reporting to the WTP based on UG, CWP and CTF predictions.

This information should all be provided as part of the permit application to provide supporting data on the type/adequacy of proposed water treatment and mitigation.

4.2.4 Predictions of seepage from waste rock will be made for years 1 and 2. Uncertainty related to unsaturated hydrology and surface area of waste rock will be addressed in sensitivity analysis" (p. 276) This information should be provided now as it is necessary to calculate the water balance for the mine site, which should be included in the permit application.

4.2.4 Although Tintina proposes to place tailings in a 0.5 to 2% cemented paste, each lift will behave as a massive block, and is unlikely to disintegrate as was observed for the laterally unsupported 2-inch diameter, 6 inch tall 2% cemented core during kinetic testing. The sensitivity of the predicted water quality to this assumption will be tested in sensitivity analyses. (P. 276). This analysis should be completed as part of the application because it's necessary in determining tailings management.

4.2.5 According to the permit application, "In the absence of final geochemical test results, the quality of the water reporting to the WTP has been estimated based on worst case groundwater quality and process water measured during metallurgical testing." Final geochemical test results are needed in the permit application to provide more accurate assessments of anticipated water quality.

SECTION 5.0 MITIGATIONS

All mitigation measures should include data on the effectiveness of these mitigation measures over time and at similar mine operations. For example, information should be provided on the track record and "life expectancy" of liner systems over time to control mine seepage or infiltration. This is particularly necessary for mine facilities that must be managed in perpetuity.

SECTION 6.0 MONITORING

Section 6.3: According to permit application, "As permitting proceeds and construction of new mine support facilities are anticipated, additional water resource monitoring of these facilities will be warranted. Tintina proposes the following for new facility monitoring sites to provide a technically sound and regulatory sufficient monitoring program. It proposes 3 new surface water sites, 7 downgradient well sites and five new wetland piezometers. Tintina states that this should be done early in the EIS process, and will allow at least one year of new baseline facility monitoring data collection before construction." (p. 282)

Baseline data should be collected and presented during the permit application stage, not at a later date, and one year of data isn't sufficient to characterize these resources. As noted in the baseline data section, additional surface and groundwater monitoring are necessary.

SECTION 7.0: RECLAMATION AND CLOSURE

MCA 82-4-336(10) requires the permit application to include a reclamation plan that provides sufficient measures to ensure public safety and to prevent the pollution of air or water and the degradation of adjacent lands.

Inadequate detail on seepage management. The permit application indicates that waste rock and tailings will generate acid, with cement or without cement. Tintina is relying on the tailings facility design, construction and management to contain acid generation in perpetuity. The permit application indicates that the seepage rate under fully saturated condition modeled is approximately 4.2 gallons/day (p. 152). Detail is needed on how this seepage will be managed,

potentially in perpetuity, and how it will be managed if the seepage rates are higher than expected. Details are needed on how this water treatment plant will be maintained over the long-term, and whether there are other alternatives to active water treatment.

Inadequate post-closure monitoring Two groundwater monitoring wells are insufficient to determine whether groundwater quality is affected post closure. Similarly, there are insufficient surface water monitoring sites to detect impacts to water quality or flows. A more thorough description, with a comprehensive monitoring, is needed in the permit application.

Long-term disposal of contaminated sediments According to the reclamation and closure plan, "Tintina will backfill as much of the development workings as possible with cemented tailings during operations, (for example the access ramps to the lower sulfide zone should it be mined out in advance of the upper sulfide zone) or with other mine facility waste materials (i.e., copper-enriched rock stockpile liner protection materials, *potentially contaminated sediments from the process water or seepage collection ponds, and any possible contaminated materials from the surface of the portal pad*). These materials will be placed below the ultimate groundwater level in closure." (p. 314). Additional data is needed to characterize these potential fill materials (e.g., contaminated sediments), and analysis is needed on potential groundwater quality effects of disposing of this material underground.

Liner durability or life-expectancy of liner systems/seams/etc. Detailed information is needed on the life expectancy of all HDPE and other liner systems used in mine facilities, and how repairs and or replacement will be addressed in the event of tears, leaks, etc. in the short and long-term.

Appendix K: According to Appendix K (p. 41), a dam breach study will be completed as part of future design phases, if required. This information is necessary for the development of a spill response plan. Tintina should also conduct an analysis of a breach of the process water pond, which would also have substantial adverse impacts.

Appendix O, According to the file provided by Tintina in its permit application, the weed management plan in Appendix O is under revision. MCA 82-4-336(g) requires the permit application to include measures for controlling and managing weeds, which is not fulfilled by a plan under revision.

Appendix P: MCA 82-4-335(5)(m) requires the permit application "to provide a plan identifying methods to be used to monitor for the accidental discharge of objectionable materials and remedial action plans to be used to control and mitigate discharges to surface or ground water."

An emergency spill response plan is missing for the mine plan. Appendix P, which outlines the company's spill response plan, provides information for the exploration decline proposed last year, not the full mine plan. There is no plan for how it will address transportation spills, pipeline spills, tailings spills, etc. According to the file submitted by Tintina, the draft plan is under revision.

Appendix Q: The alternatives analysis for siting of major facilities is identified in the permit application as "pending." Analysis of the application without this critical document is difficult and the application should not be considered to be administratively complete without it.