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October 12, 2001

Your file - Votre référence

Our file - Notre référence

Mr. Vern Christensen  
 Executive Director,  
 Mackenzie Valley Environmental Review Board  
 P.O. Box 938  
 Yellowknife, NT, X1A 2N7

Dear Mr. Christensen:

**Re: Environmental Assessment Prairie Creek Mine - Phase II Mineral Exploration Drilling Program and Metallurgical Pilot Plant Program/Underground Decline**

The Department of Indian Affairs and Northern Development (DIAND) provides the following as further clarification to the outstanding issues that are still of concern to us following Canadian Zinc Corporation's reply to our technical comments ( August 31, 2001 memo). We feel that it is necessary to alert the Board that the concerns regarding site water management have only partially been addressed by the August 31 memo.

It is noted that many of these comments relate to a lack of information and that mitigation of potential impacts could be effected through the regulatory process. We hope the Board will give full consideration to these comments and our staff are available if further clarification is required.

**1. Tailings Dam Integrity**

The proponent states on several occasions that the tailings facility has remained stable since the slope failures in 1982. In the BGC geotechnical report discussion about the stability of the tailings pond backslope, it is reported that installation of slope inclinometers, thermistors and piezometers was done at the end of October 1994. The report then states that "By the time of the 17 May 1995 site visit, all slope indicator casings were rendered inoperable due to excessive movements". (Section 2.5, page 4). This indicates that the slope movement was active as late as 1995, the last time the geotechnical engineers were on site. The slope movement between October 1994 and May 1995 was great enough to destroy the sensors installed to measure it. As there is a question of integrity of the tailings containment area, a geotechnical assessment of the stability of tailings pond backslope is necessary prior using the pond for wastewater disposal.

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- 2 -

During the 28 August 2001 site visit, DIAND observed erosion of the riprap on the tailings berm. This erosion is occurring in an area a couple hundred metres upstream of the erosion noted in the BGC report. In their reply to the technical comments, the proponent "*cautions that casual observations by personnel not specifically trained in geotechnical engineering ... can be misleading and should not be substituted for that of the expertise and judgement of trained professional engineers ...*" DIAND strongly agrees that the site assessment should be made by certified geotechnical engineers. As these trained professional geotechnical engineers have not been on site since 1994 or 1995, an updated site assessment and report is required.

## 2. Tailings Pond Water Level

In the proponent's response to DIAND IR#1, it was stated that the water level in the tailings impoundment was 868 metres. From their survey on-site in September 2001, the water level was reported to be 869.5 metres, exactly the same as the level in the 1994 geotechnical report. From this latest survey, it was concluded "*that the pond level has not changed significantly since 1994*", but a natural fluctuation of 1 metre is reported in the BGC geotechnical assessment.

There appears to be significant inconsistencies either in the measurement or in the reporting of water levels in the tailings pond. Systematic monitoring of tailings pond water levels, and of water inputs and outputs would greatly assist in confirming statements regarding pond level stability. DIAND does not believe that an adequate assessment of seepage from the pond can be made with two water level measurements, one in 1994 and the next in 2001.

## 3. Groundwater Monitoring

There are still questions regarding the apparent stability of the tailings pond water level. Until these questions are resolved, groundwater monitoring should not be dismissed.

## 4. PMF Re-calculation

The IR#1 response indicates the probable maximum flood calculation was done with data from 1975 to 1980 at the Prairie Creek flow gauge. In the response to the technical review, the proponent states that the tailings dam was designed using a Probable Maximum Flood (PMF) calculated from a Probable Maximum Precipitation (PMP) event based on regional climatic data and that the calculation of the Probable Maximum Flood does not require streamflow measurements. This discrepancy needs to be resolved.

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- 3 -

The methodology used for the proponents Probable Maximum Flood calculation must be provided, along with data sources. The accuracy of a PMF calculation relies heavily on relating long-term streamflow measurements to a PMP calculation, which is based on long term precipitation records. Because of variation in precipitation (with time, elevation and geography) and variation in each catchment's runoff response to precipitation (with basin morphology), the relationship of PMP to PMF is best calculated using local precipitation and streamflow data collected over a long term. The statement that regional climatological data were used to determine the PMP indicates that long term records of local precipitation are lacking for the Prairie Creek area. Rainfall data are available from several stations in the area, including from Cadillac Mine from 1970 to 1982 and Tungsten from 1966 to 1990. Also, there are 10 additional years of streamflow data from the "Prairie Creek at Cadillac Mine" gauge and, presumably, 20 additional years of regional climatic data from which an updated PMF can be calculated. As there are unresolved questions about the erosion of the rip-rap along the tailings dam berm, re-assessment of the flood potential seems warranted at this time.

The proponent states that "*The impoundment has clearly withstood all flood events over the past 20 years*". While it is obvious that a catastrophic event has not destroyed the berm, the proponent fails to address the fact that erosion of the riprap armour is occurring at the base of the berm. During the 28 August 2001 site visit, DIAND went down to where the riprap erosion is occurring and observed how unstable some of the large armour boulders have become. This erosion can also be the result of the steady erosive forces of normal stream flows in this high energy area. As DIAND has stated in previous reviews, the extent and effects of this erosion need to be assessed by a qualified geotechnical engineer.

##### 5. Tailings Pond Water Quality

Results of the analysis of a water sample from the tailings area were provided by the proponent, however, it is incorrect to state that "*water quality data indicate that the concentrations of key parameters of interest are actually lower in the pond than the average values for Prairie Creek used in the tailings pond chemistry model provided in response to the information requests.*" The average value in the LA, which was calculated from various samples of Prairie Creek water, reported **total** metals, whereas the sample which was collected on August 30, 2001 was analyzed for **dissolved** metals. By definition, dissolved plus particulate metals should equal total metals and consequently dissolved metals should always be less than total, so they cannot be directly compared.

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- 4 -

#### 6. 870 Portal mine water discharge

Estimated discharge volumes from the 870 m portal range between 2 to 10 lps -120 to 600 L/min- (reply to DIAND IR #8) to a rate of 80 L/min (Response to Technical Review... 21 September 2001). An accurate determination of the discharge volume and timing from this portal is required. The flow path of this water is across the mill site to the catchment pond where it then discharges to Prairie Creek via Harrison Creek.

#### 7. 870 Portal mine water quality

Laboratory analysis of water from the 870 portal, as sampled by a variety of people from 1980 to 1999, shows elevated levels of aluminum, arsenic, cadmium, copper, iron, mercury, lead, selenium, silver, and zinc that exceed the CCML Guidelines for the protection of freshwater aquatic life.

#### 8. Decline minewater monitoring

The Environmental Assessment Report explains that minewater will go to a settling pond and then be released to Harrison Creek if appropriate. It is noted that at the moment, minewater is coming from the 870 portal at a rate of approximately 80 litres per minute, and draining into a sedimentation pond which empties into Harrison Creek. While CZN emphasizes that the 870 portal and mine workings are not related to the current application, there are concerns about the cumulative impact of minewater discharges from the existing portal, from the new decline, and from site runoff, all of which could potentially be directed to Harrison Creek. Should the quality of this water be poor or marginal, the cumulative effect of all of these wastewater streams would have a significant impact on the water quality of Harrison Creek and Prairie Creek. Although the results of an analysis of water samples from the 870 level were provided, there is still uncertainty with regard to the variability of the quality of this drainage at different times of year, and the potential effect of the combination of this wastewater with drainage of unknown quality from the new decline.

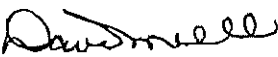
With regular monitoring of the sedimentation ponds and enforcement of water quality standards, it is felt that the potential significant impacts on water quality can be mitigated. This may require the establishment of structures to control site drainage and minewater discharges, or methods to treat poor quality wastewater. At the regulatory stage a site wastewater management plan should be provided, which would include a site water balance incorporating all wastewater streams - process water, site runoff, minewater, camp wastewater and sewage. As well, CZN is very fortunate that a large volume of

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- 5 -

baseline water quality data exists in this area, both as a result of monitoring performed as a result of the Prairie Creek property and other studies done in the area. A complete compilation of this baseline data should be provided at the regulatory stage to set licence criteria.

Sincerely,

  
for David Livingstone, Director  
Renewable Resources and Environment

**FAXED**  
Oct 9 2001

Mackenzie Valley Environmental Impact Review Board

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<b>NOTES:</b>	<i>Peter, please see the attached yours, L. Azzolini</i>		

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