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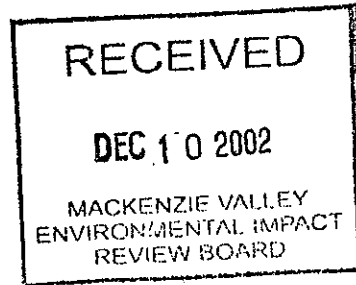
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*ENW - DIAND response*

*Apologies for the delay*

*Marie*





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*Your file - Votre référence*

*Our file - Notre référence*

December 10, 2002

Louie Azzolini  
Environmental Assessment Officer  
Mackenzie Valley Environmental Impact Review Board  
P.O. Box 938  
Yellowknife, NT, X1A 2N7

Dear Mr. Azzolini:

**RE: DIAND comments on CZN Response to Information Request - MVEIRB IR#1-  
Underground Decline/Exploratory Drilling and Metallurgical Pilot Plant Canadian  
Zinc Corporation (CZN), Prairie Creek Minesite, NWT**

The attached comments on the above, are provided by the Department of Indian Affairs and Northern Development (DIAND), in response to the Review Board's request received on November 18, 2002.

There is a lack of sufficient detail in the response provided by CZN in order to complete an analysis of this preferred option.

CZN's last submission indicates that its proposal to deal with the Pilot Plant and the mine water from the underground decline is to treat if necessary, and discharge to the surrounding environment. It is not sufficient to state that treatment will take place if necessary. A basic level of information on the means of treatment proposed by CZN for minimizing impacts is necessary at the assessment stage.

In its response, CZN has also stated that it is prepared to proceed with the developments without using the tailings pond. Therefore it is important for CZN to also describe its alternatives to its proposal to discharge to the environment. CZN will need to provide an assessment of the impacts of carrying out its proposal and will also need to provide an assessment of its alternatives which are technically and economically feasible for containment of all effluent and discharge. While the company has outlined the use of sumps, settling ponds and polishing ponds, there is insufficient information provided on the design and location of these structures. The company's plans for water treatment including retention times, expected outcomes, means of transfer between facilities will also need elaboration and assessment in order for DIAND to complete its analysis.

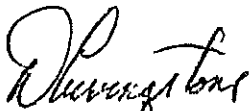
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The attached comments are provided as a more detailed outline of DIAND's issues on this front. Please do not hesitate to contact me if clarification is needed on our response.

Yours sincerely,



David Livingstone  
Director, Renewable Resources and Environment

attachment.

**SUBJECT: DIAND comments on CZN Response to Information Request - MVEIRB IR#1- Underground Decline/Exploratory Drilling and Metallurgical Pilot Plant Canadian Zinc Corporation (CZN), Prairie Creek Minesite, NWT**

### **General Comments**

In its response CZN states that "it is prepared to proceed with the developments without using the tailings pond." In the IR response it is evident that CZN's proposal will now be to discharge to the environment with treatment if necessary. Therefore CZN will need to provide information on its proposed alternatives to its current plan to treat and discharge to the surrounding environment. If the alternative is to be on-site containment, reviewers will need the sufficient detail in order to complete an analysis of CZN's assessment of this alternative.

Given the water quality data available, we feel that it will be necessary to implement a water treatment system for the 870 m portal discharge, with the assumption of treatment of both the pilot plant process water and decline minewater. The Response to Information Request does not provide sufficient design detail for the underground sump treatment system, polishing pond construction, and additional settling pond construction if required. DIAND is unable to assess the system design without some degree of information on specifications for capacity, flow rates, treatment criteria, and confirmatory monitoring.

There is also insufficient information on the treatment design including location for the polishing pond, retention times in facilities, means of transfer (exfiltration or pumping) of discharge from one treatment location to another. It is necessary to obtain a certain level of information on the design of these facilities and the proposed treatment in order to assess the adequacy of treatment options to determine the effectiveness of the proposed treatment system.

Other information provided by CZN on water quality predictions do not include methodology and calculations necessary to assess potential discharge quality or impacts to Prairie Creek.

The following comments are provided to better outline DIAND's position that more information is necessary in order to complete our analysis of CZN's methods.

It is recognized that some of the detail on sampling protocol, laboratory analysis etc is best suited to regulatory instruments for implementation. However our discussion on these points is presented with the view that it may assist the company and the Board in understanding DIAND's need for additional information.

### **Underground Decline/Exploratory Development Description**

Although the company (CZN) states that the decline will be driven through mostly

dolostone/limestone rock, it will intersect the mineralized vein at least once. As admitted by the company, the mineralized vein will act as a water conduit. Once this vein has been intersected, groundwater will drain into the decline. Given that this volume of water is difficult to accurately estimate in advance of decline development, the company must be prepared for worst case scenario and assume decline discharge volumes comparable to 870 m level discharge volumes.

Also, the company has stated that water quality from the 870 m level will likely not be representative of the minewater collected from the decline due to fewer crosscuts or intersections of the mineralized vein. Assumptions by CZN provided in MVEIRB IR#1 rely on minewater having limited contact with vein mineralization. DIAND recognizes that existing workings have been exposed to atmospheric conditions since the original development and oxidised ore and this rock would react much differently with air and water than freshly blasted rock. However, DIAND feels that the company's assumption lacks substantive evidence due to the uncertainty of groundwater movements in any ore body. In order to provide contingency in development of the treatment process, the minewater quality in the decline should be assumed to be similar to that of the minewater in 870 m level.

At issue here is that CZN has not provided data to substantiate their claim that water quality from the 870 m level will not be representative of water collected from the decline. The suggestions below may assist in providing more certainty to reviewers as to mineral content of discharges and how CZN plans to manage these discharges.

It is suggested that CZN may wish to drill a pilot hole in advance of the face, as was done during the Snap Lake underground exploration program. This may intersect any water bearing structures well in advance of underground development. If there is grouting equipment on site they would be able to grout the water seam thereby sealing off any water coming into that part of the development or, if this is not feasible it would at least ensure that adequate pumps are available on site to handle de-watering requirements.

As with any mineralized rock, the grade is not consistent and variations in grade could result in variable mineral content of water discharges. CZN may want to provide the analysis of additional testing of core samples in the area of the proposed mineralization development to substantiate any differences from higher levels of the mine.

The company also describes the potential issues which could arise from nitrogen compounds in blasting residue. DIAND agrees that minimizing explosives use and proper handling procedures are the most effective ways to control nitrogen loadings, however, the company should provide a contingency plan describing how they plan to treat minewater should ammonia levels exceed discharge limits.

DIAND feels that the detail on frequency of treatment, and general protocol is more clearly a regulatory requirement and not part of this request for such a contingency plan.

Information on the design should be provided for the underground sumps together with potential retention times, plans for handling any residual hydrocarbons (it is possible that not all

hydrocarbons will be removed by skimming with absorbent pads or booms), and means of transfer to the polishing pond. The treatment design should include a commitment to undertake confirmatory water sampling should be done in the underground sump for Total Metals, Total Suspended Solids, Hydrocarbons (BTEX, TVH, TEH) and ammonia regularly to detect a problem in minewater quality before it is transferred to the polishing pond. A description of the confirmatory sampling procedures, should be provided to determine if treatment options are adequate to mitigate potential water quality problems prior to release into the settling pond and Harrison Creek.

For Consideration in Regulatory instruments:

The detail of this confirmatory sampling protocol is best implemented through regulatory instruments.

**Treatment Procedures and Equipment**

As noted previously, the design details have not been provided for the underground sump treatment system, polishing pond construction, and additional settling pond construction if required. DIAND is unable to assess the system design without details and specifications for capacity, flow rates, treatment criteria, and confirmatory monitoring.

Lime addition is a proven technology for the removal of elevated dissolved metals from water.

For Consideration in Regulatory instruments:

Details on the lime addition system and slurry mechanisms will need to be provided as part of regulatory requirements in order to assess the effectiveness of the treatment system. The frequency of confirmatory sampling to be carried out treated process water to determine discharge quality and information on how often routine water quality monitoring will be done on the water in the polishing pond will also be needed.

**Projected Treatment Effectiveness**

Minewater treatment comparisons were made with the Silvertip underground lead/silver/zinc property in BC. In Table 4, the raw mine discharge has a total zinc value of 14.0 mg/l. The achievable treated discharge, using the Silvertip data provided, resulted in a total zinc value of 0.39 mg/l. This value would exceed the average maximum discharge limits for zinc in the old water licence. According to Table 2, three samples collected in the past have exceeded 14.0 mg/l for total zinc.

Would the process used at Silvertip mine result in a discharge that would meet potential water licence limits for the Prairie Creek minesite?

It would be useful for CZN to provide information on the nature of the grade of the Silvertip orebody for comparison with the grades and host country rock of the Prairie Creek project in order to better assess their comparisons of the two projects.

### **Environmental Impact Assessment Water Quality Impacts**

In order to assess the validity of water quality projections, DIAND requires a description of the methodology used in the models, including formulas and calculations.

The water quality predictions are based on dilution. Despite the fact that the model predicts under worst case no treatment scenario (Table 5-1) that the CPFAL guidelines would be met in Prairie Creek at Galena Creek, the model indicates that the discharge from Harrison Creek will exceed water old water licence discharge limits for total zinc in two of the four scenarios. Assuming that a new water licence, if issued, used the same discharge guidelines, CZN would be in a state of non-compliance. In the worst case scenario, the predicted concentration of total mercury exceeds the maximum grab sample concentration in the old water licence. Based on the four water quality predictions, without any further information on methodology, CZN will be required to treat both the discharge from the 870 m level and the discharge from the proposed decline.

CZN should provide a contingency plan in the event that discharges from the decline are higher than the model accounts for. The final site discharge from the settling pond must be able to meet applicable discharge criteria. The commitment to provide general information of what is contained in such a contingency plan should be obtained as part of the Environmental Assessment.

#### For Consideration in Regulatory Instruments:

It is recognized that the detail of limits and protocol for sampling or treatment are more appropriately dealt with in the regulatory instruments.

### **Accidents and Malfunctions**

A commitment should be obtained from CZN in the Environmental Assessment stage, that the pumping and distribution system will be inspected regularly with approval of frequency through regulatory instruments.

#### **Table 1**

The lack of information on methodology leaves DIAND unable to assess the adequacy of the data. In the absence of such information, DIAND's views on treatment will be based on the data currently available. If any additional data are available to support the Tailings Effluent

Characterization in Table 1, we will be pleased to review this and re-evaluate if appropriate any recommendations provided to the Board with respect to these effluent issues.

**Table 2**

As noted above, if DIAND would be pleased to review any additional laboratory analytical results for Harrison Creek (discharge from settling pond) which were not identified in the original data for the "Historical Water Quality of the Prairie Creek Project Area".