

October 29, 2010

Chuck Hubert
Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
Via E-mail: chubert@reviewboard.ca

Re: Canadian Zinc EA – Information Requests

These information requests (IRs) are being submitted on behalf of Dehcho First Nations (DFN).

IR Number: DFN-1

Source: Dehcho First Nations

To: Canadian Zinc

Subject: Use of Initial Dilution Zones (IDZs)

Preamble: Canadian Zinc Corporation (CZN) had originally proposed the use of a diffuser for the discharge of wastewater into Prairie Creek. CZN is now proposing a simple pipe for discharge of mine wastewater into Prairie Creek with the use of downstream mixing to meet receiving water quality objectives.

As was explained at the recent technical session, the basis for this change in CZN's water treatment plan is a document released on April 29, 2010 by the Land and Water Boards (LWBs). The document, titled *Water & Effluent Quality Management Policy – FINAL DRAFT*, has already been posted to the public registry for this EA.

With regards to the use of IDZs, the LWB document states the following:

“Note that the establishment of an *initial dilution zone (IDZ)* will be considered by the *Boards* on a case-by-case basis such that the water quality standards for the *receiving environment* will need to be met outside of the *IDZ*. Guidelines respecting *IDZs* will be developed as noted in Appendix A.”

Request: (1) Please explain how the switch from the use of a diffuser with end-of-pipe discharge limits to a simple discharge pipe with extremely long IDZs can be considered more protective of water quality and aquatic life? If it is not, what is the basis for the switch? Is it just about saving money for CZN?

(2) Has CZN had any meetings or correspondence with the MVLWB to discuss the use of IDZs in Prairie Creek? Please provide details such as meeting notes, letters and e-mails. Please explain what the MVLWB's reaction has been to CZN's proposed use of IDZs in Prairie Creek. Has it been positive or negative?

(3) If CZN has not held any discussions with the MVLWB, on what basis is CZN assuming that the MVLWB would favourably review a proposal for IDZs in Prairie Creek? Is the single line noted above in the draft LWB document the sole piece of information that CZN is relying upon in assuming that the MVLWB would approve of IDZs at Prairie Creek?

IR Number: DFN-2

Source: Dehcho First Nations

To: Canadian Zinc

Subject: Where can IDZs be used?

Preamble: The impetus for the LWBs document was a 2006 Indian and Northern Affairs Canada (INAC) document titled *Towards the Development of Northern Water Standards: Review and Evaluation of Approaches for Managing Water Use in Northern Canada*. With regards to the use of effluent mixing zones, the INAC paper in turn relies on a publication titled *Surface Water Quality Objectives* dated 1997 by Saskatchewan Environment. That 1997 publication was updated in 2006.

The LWB document provides no guidance however as to the criteria that would be used when deciding whether or not to approve the use of an IDZ. The INAC document also does not provide any criteria but does state the following:

"Guidelines for initial dilution zones - As IDZs are likely to be integrated into the framework for managing water quality in the north, development of guidelines for IDZs represents an important near-term priority. Such guidelines already exist in certain other Canadian jurisdictions (e.g., SEPS 1997) and can be used as a basis for developing such guidelines for the Mackenzie Valley. The guidelines should specify the procedures for determining the extent of IDZs and the general provisions that need to met within the IDZs;"

Going then to the Saskatchewan Environment document does provide some guidance on this issue. That document states:

“The effluent mixing zone guidelines are intended for application to larger surface waterbodies. However, they also have limited application to some intermittent streams and small lakes that have sufficient flow or volume of water, at least seasonally, to adequately assimilate periodic discharges of treated wastewater effluent.”

Request: Please explain the basis for CZN assuming that IDZs would be approved for continuous use in Prairie Creek given that the most direct guidance available suggests that the use of IDZs would be restricted to larger surface water bodies or periodic discharges in smaller water bodies.

IR Number: DFN-3

Source: Dehcho First Nations

To: Canadian Zinc

Subject: Design standards for the use of IDZs

Preamble: If approval for IDZs were given to CZN, the IDZs would need to meet specific design criteria such as the extent of the IDZs in relation to Prairie Creek as whole. Following are some examples of these criteria from Saskatchewan.

1. At the outer edge of the mixing zone the water quality should not be appreciably different from the water quality prior to the discharge of the effluent.
2. The size of the mixing zone will be influenced by the difference in water quality between the effluent and the receiving waterbody and the volume of effluent relative to the receiving waterbody.
3. The mixing zone should be as small as practicable and should not be of such size or shape as to cause or contribute to the impairment of existing or likely water uses.
4. The existing General Objectives for Effluent Discharges (Section 3.1) should be achieved at all sites within the limited use zone.
5. The limited use zone in streams and rivers should be apportioned no more than 25 percent of the cross-sectional area or volume of flow, nor more than one-third of the river width at any transect in the receiving water during all flow regimes which equal or exceed the 7Q10 flow for the area.
6. Surface water quality objectives **applicable to the area** must be achieved at all points along a transect at a distance downstream of the effluent outfall to be determined on a case-by-case basis.
7. The mixing zone should be designed to allow an adequate zone of passage for the movement or drift of all stages of aquatic life; specific portions of a cross-section of flow or volume may be arbitrarily allocated for this purpose.

8. Mixing zones should not interfere with the migratory routes, natural movements, survival, reproduction, growth, or increase the vulnerability to predation, of any representative aquatic species, or endangered species.
9. Mixing zones should not interfere with fish spawning and nursery areas.
10. When two or more mixing zones are in close proximity, they should be so defined that a continuous passageway for aquatic life is available.
11. When two or more mixing zones overlap the combination of the effluent plumes should not result in unacceptable synergistic or antagonistic effects on aquatic life or other water uses downstream of the mixing zone(s).
12. Mixing zones should not cause an irreversible organism response or attract fish or other organisms and thereby increase their exposure period within the zone;
13. The 96 hr LC50 toxicity criteria, for indigenous fish species and other important aquatic species should not be exceeded at any point in the mixing zones;
14. Mixing zones should not result in contamination of natural sediments so as to cause or contribute to excursions of the water quality objectives outside the mixing zone.
15. Specific numerical water quality objectives may be established for such variables or constituents thought to be of significance within the effluent mixing zone.
16. Defining the effluent mixing zone may need to be done on a case-by-case basis, particularly where effluent is discharged into smaller waterbodies (i.e. streams and small lakes).

Request: Please provide evidence and explanations as to how CZN has met the requirements of each of these 16 criteria in its proposed use of IDZs in Prairie Creek. In particular, please ensure that this evidence includes (1) an analysis of the flows, width and cross-sectional flow areas of the plumes as compared to Prairie Creek as a whole for each contaminant and under each flow condition and (2) an explanation as to how the use of a simple pipe instead of a diffuser would satisfy Criteria #3.

IR Number: DFN-4

Source: Dehcho First Nations

To: Mackenzie Valley Land and Water Board

Subject: Use of Initial Dilution Zones (IDZs)

Preamble: Canadian Zinc Corporation (CZN) had originally proposed the use of a diffuser for the discharge of wastewater into Prairie Creek. CZN is now proposing a simple pipe for discharge of mine wastewater into Prairie Creek with the use of downstream mixing to meet receiving water quality objectives.

As was explained at the recent technical session, the basis for this change in CZN's water treatment plan is a document released on April 29, 2010 by the Land and Water Boards (LWBs). The document, titled *Water & Effluent Quality Management Policy – FINAL DRAFT*, has already been posted to the public registry for this EA.

With regards to the use of IDZs, the LWB document states the following:

“Note that the establishment of an *initial dilution zone (IDZ)* will be considered by the *Boards* on a case-by-case basis such that the water quality standards for the *receiving environment* will need to be met outside of the *IDZ*. Guidelines respecting *IDZs* will be developed as noted in Appendix A.”

- Request:**
- (1) Has the MVLWB had any meetings or correspondence with CZN to discuss the use of IDZs in Prairie Creek? Please provide details such as meeting notes, letters and e-mails. Please explain what the MVLWB's reaction has been to CZN's proposed use of IDZs in Prairie Creek. Has it been positive or negative?
 - (2) Does the MVLWB have any additional guidance available on where and under what criteria it would approve the use of IDZs? Please provide this information.
 - (3) Please review IRs DFN-1 to DFN-3 which were directed to CZN. If the MVLWB has any information to offer with regards to these IRs, please do so.

IR Number: DFN-5

Source: Dehcho First Nations

To: Canadian Zinc

Subject: Parks Canada and Environment Canada IRs

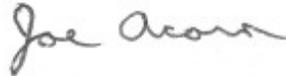
Preamble: DFN has had the benefit of quickly reviewing the IRs that were submitted earlier today by Parks Canada and Environment Canada.

Request: (1) For the Parks Canada IRs, please ensure that the answers provided are for the Prairie Creek Mine as a whole including all mine activities and impacts regardless of whether or not those activities and impacts occur inside or outside of the boundaries of Nahanni National Park Reserve.

(2) For IRs related to water quality, water balances and chemical loadings to Prairie Creek, please ensure that exfiltration from both mine workings and the surface water ditches and subsequent movement to Prairie Creek through groundwater flows are included in all calculations and analysis.

If you have any questions, please contact me.

Sincerely,



Joe Acorn