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Your file - Votre référence

NWB1NAN

Our file - Notre référence

June 10, 2003

Rita Becker
Manager - Finance, Licensing and Administration
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NT
X0E 1J0

Dear Ms. Becker:

On behalf of Indian and Northern Affairs Canada (INAC), I have reviewed Canzinco Limited's *Response to Peer Review Comments* dated May 19, 2003 (hereafter referred to as the "Response"). Generally, INAC is pleased with the response as the company has incorporated our primary concerns with the Human Health and Ecological Risk Assessment (HHERA) into the reassessment. Example calculations have been provided, including an improved explanation of variable (terminology) applied. In addition, background data for the townsite has been re-valued and this is a significant factor in reducing the Soil Quality Remediation Objectives (SQROs) for the townsite. Explanations of other concerns previously identified provide a clearer understanding of the actions and decisions taken in the Risk Assessment Process followed by Jacques Whitford Environmental Limited (JWEL). However, there are some exceptions to this and the outstanding issues are summarized below.

1. Human Health Risk Assessment (HHERA) Uncertainty Analysis (Response, Comment 5, Page 13)

INAC is of the opinion that the combined exposure should be considered when different elements can impact the same organ, in this case lead and cadmium and the kidney. In cases where the impact of each single element has no known effect at the exposure experienced, it is the combined exposure that affects the organ, and the additive effects should be considered. The challenge resulting from this is that the accepted contaminant concentrations become interdependent on one another. For example, in the townsite, the lead SQRO is below the EPC; however, cadmium is also present. If additive effects are considered, the accepted lead concentration (SQRO) will be influenced by the concentration of cadmium present.

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2. House Dust (Response, page 38)

Under separate cover, BC Research provided comments regarding the significance of lead in house dust. The response to the Government of Nunavut states that lead in the houses is most likely a result of "tracking-in of dust from residents/ employees during the time of mine operation when ores, concentrates and tailings were being handled". This has not been verified, and an equally probable source is townsite contamination being tracked-in by not only the miner, but also other family members including children. Further consideration of this second source is required. If lead contamination in the townsite is a factor, remediation of the townsite should be sufficiently thorough to ensure that further contamination of the homes does not occur.

3. Environmental Risk Assessment (ERA) for Lemming, ERA Comment 2 (Response, page 14)

The further explanation is adequate, including the information from the Cantox (Polaris) study which demonstrated that the inhalation pathway contributed less than 1% of the lemming exposure. It should be noted that Cantox did consider inhalation as a reasonable pathway for their evaluation.

4. ERA Comment 5 (Response, page 15)

An adequate evaluation of exposure to birds based on reference criteria (HERD note 4, December 2000) regarding adult/juvenile exposures would reflect that differing health outcomes between adult and juvenile birds can be expected. Ecological risk factors were also used to set SQRO values for all contaminants (cadmium, copper, lead, and zinc) at the dock and for copper at the mine site. However, since these values are significantly above the EPC values, INAC agrees with Canzinco that further refinement of the ERA on this basis in not required.

5. ERA Comment 12 (Response, page 17)

Please refer to comments under HHERA, Comment 5. INAC believes it would be prudent to recognize that metal exposures may have additive effects on organs (like humans, animals must process contaminant metals through the liver and kidney and these organs become vulnerable to combined effects of exposure). As a minimum, Canzinco should recognize this in the ERA, and provide clear justification as to why the SQRO values are significantly above the EPC and the further step is unnecessary.

6. Sample Calculation (Response, page 37)

The sample calculation in the appendix of the Response does not provide the final step in calculating the SSTL and SQRO (the same applies to the equation in the original HHERA). This is required as it will clarify whether background soil concentrations are

being used in determining acceptable future soil concentrations of contaminants.

7. Lead as a Carcinogen comment 2 (Response, page 4)

It appears that Canzinco is not accepting the suggestion that lead is a carcinogen or could be a concern in the future, and there is significant reference to the absence of appropriate reference values needed to conduct calculations. In addition, the rating of lead as a Group 2B carcinogen by the IARC (possible human carcinogen) and a B2 carcinogen by the EPA (probable human carcinogen) has been ignored. The presence of lead in homes, lead in the townsite, and the cancer concern suggests that this should be considered. If, as has been suggested, no data is available, this uncertainty should be incorporated into these considerations.

Should you have any questions in regards to the above comments, please do not hesitate to contact me at (867) 975-4548 or by e-mail at mcchristiem@inac.gc.ca.

Sincerely,

*Original signed by:*

Michelle McChristie
Manager, Water Resources