CANADIAN ZINC CORPORATION

September 16, 2011

Chuck Hubert
Environmental Assessment Officer
Mackenzie Valley Review Board
Suite 200, 5102 50th Avenue,
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Dear Mr. Hubert

RE: <u>Environmental Assessment EA0809-002, Prairie Creek Mine</u>
<u>AANDC's Final Submission and Proposed Site-Specific Water Quality Objectives</u>

The purpose of this letter is to provide a response to the Final Submission from Aboriginal Affairs amd Northern Development Caanda (AANDC) with respect to proposed site specific water quality objectives (SSWQO's) for the Prairie Creek Mine, and to explain the position of Canadian Zinc Corporation (CZN).

Initial Approaches to Establishing SSWQO's

Recognizing that the Prairie Creek hydrologic ecosystem is a very dynamic and variable system in terms of flows, CZN has proposed a water management scheme reflective of the receiving environment. In the Developers Assessment Report and our replies to Information Requests, CZN's approach to water quality impact assessment has been to propose a load-based discharge approach and to compare predicted receiving water quality to acceptable, established toxicity guidelines that were verified to be applicable to under these circumstances in order to avoid any significant adverse environmental impact. This approach involved a calculation of upstream mean concentrations. The objectives chosen were largely based on accepted, nationally established CCME guidelines, after verifying that each guideline is sufficiently protective of specific northern species expected to be in the Prairie Creek drainage (and/or taxa commonly found in cold, swift moving streams). The objectives were the basis for our impact assessment discussed at the Public Hearing.

In their Technical Reports, Aboriginal Affairs and Northern Development Canada (AANDC) and Parks Canada proposed that all objectives should be based on natural background variability, as defined by the Reference Condition Approach (RCA). Their rationale for selecting the RCA was that the goal is to avoid any significant change to the aquatic ecosystem, and that they would have the most confidence that there would be no significant changes if analyte concentrations were maintained within the natural range of variation. AANDC also noted that other considerations should also be taken into account, including socio-economics. Parks Canada

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appeared to consider the adoption of RCA as consistent with their definition of maintaining ecological integrity.

In our opinion, CZN's approach is more than adequate to ensure there will be no significant adverse impacts on the aquatic environment, with contingencies. We understand the goal of AANDC and Parks Canada, although we do not agree that RCA benchmarks must be attained to achieve it. Analyte concentrations can exceed RCA benchmarks and still not lead to significant change in the aquatic system. Therefore, CZN does not agree that RCA benchmarks must be met for all analytes of concern (AOC's).

However, CZN took the comments by parties into consideration, including those by the representatives of aboriginal groups who encouraged CZN to use Best Available Technology (BAT) and treat the water for discharge as effectively as possible. Consequently, in the Public Hearing, CZN agreed to work with parties to obtain a mutually satisfactory solution.

Post-Hearing Framework

In their Technical Report (dated June 3, 2011), AANDC proposed that a committee be formed to consider appropriate SSWQO's. The Review Board requested details on such a committee before making a decision. After meetings between CZN and the parties, suggested frameworks were submitted to the Review Board for consideration. The Review Board decided not to pursue a formal process (letter of July 15, 2011), but encouraged the parties to pursue a satisfactory solution within the existing timeframe of the EA.

CZN has continued to work with the parties, and has followed the framework CZN submitted to the Review Board. The main progress made and outcomes are as follows:

- At the request of AANDC and their consultant Zajdlik and Associates, CZN has compiled additional data with which to calculate revised RCA benchmarks, and will consider approaches to weight the data to arrive at the most appropriate values;

- For some AOC's, the dataset contains a large proportion of "non-detects" (i.e., concentrations reported as less than the laboratory's method detection limit), and therefore the calculated RCA benchmarks for these AOC's may not be entirely accurate. A lack of data for the winter period was also noted. Immediately after the Public Hearing, CZN initiated a program of additional sample collection, with sample collection approximately every month, followed by analysis with very low detection limits. This program will continue into the spring;

- CZN has evaluated additional water storage options. AANDC had indicated that the available storage was insufficient to provide assurance that water could be stored in the event of all conceivable upsets, and additional water storage would also allow more water management and discharge flexibility. CZN has committed to establish additional water storage, either in the existing pond by raising the dykes or by building a second pond. CZN will await geotechnical studies and confirmations before selecting one of the two options.

- CZN engaged SNC Lavalin to perform a desk-based study of process water treatment options. SNC's report concluded that improved treated water quality could be achieved, using one of two approaches:
  - Enhancing the proposed sulphide-lime precipitation system by adding filtration; or
  - Pre-treatment with lime or sulphide followed by filtration and ion exchange.

  Both approaches will be carried forward for bench-scale testing. Assuming improved treated water quality results, CZN will adopt one of the two approaches. AANDC's consultant Water Engineering Technologies, Inc. (Scott Benowitz) reviewed a draft of the SNC report and provided comments.

Significant Adverse Impacts and Setting of SSWQO's

As noted above, CZN previously proposed site specific objectives considered to be protective of all aquatic biota, largely based on national CCME guidelines (CZN Proposed Objectives). Our understanding is these guidelines are set after considering all available toxicity information, and then selecting a concentration up to an order of magnitude less than the lowest exposure concentration resulting in a toxic response. In effect, a significant safety factor is applied to ensure the guideline concentration is well below the range of toxicity. Therefore, by meeting the CZN Proposed Objectives, we believe potential for significant adverse impacts will be avoided.

Since the Public Hearing, as part of the Framework discussed above, CZN has reviewed the water quality predictions in the context of our commitments to increase water storage capacity and process water treatment efficiency. As a result, revised objectives are now proposed (CZN Revised Objectives).

Also as noted above, we do not agree that RCA benchmarks must be attained to avoid significant change in the aquatic system. However, we agree that it is difficult to define what AOC concentrations above RCA benchmarks would lead to significant change. The CCME aquatic life guidelines were designed as benchmarks at which no significant changes are anticipated. Taken from CCME's introduction to the *Canadian Water Quality Guidelines for the Protection of Aquatic Life*, "Guideline values are meant to protect all forms of aquatic life and all aspects of the aquatic life cycles, including the most sensitive life stage of the most sensitive species over the long term." The guidelines were not at concentrations at which an effect would be expected. Consequently the guidelines, by definition, incorporate a factor of safety.

Table 1 (attached) provides data on Prairie Creek water quality, and the predicted water quality (columns 12-15) that would result from currently envisaged mine operations (with a combined discharge water quality based on columns 9-11). The predicted water quality data is a summary of data provided previously (IR2 Addendum, Appendix C). The CZN Proposed Objectives are given in column 8. Discharge from the mine will be regulated by the Water Board through the use of effluent quality criteria (EQC's). However, since SSWQO's will be used by the Water Board to establish EQC's, AANDC and Parks Canada want a more conservative approach taken to establishing the limits of what may be discharged. CZN agreed to compromise from the CZN Proposed Objectives in order to select SSWQO's that can then be used to establish EQC's.

CZN's compromise on this matter does not lessen our conviction that meeting the CZN Proposed Objectives will avoid significant adverse impacts.

The estimated highest predicted concentrations for mean creek flows (column 12) are those that could occur as a result of effluent discharge regulated by a load-based approach. Predictions for low creek flows (column 13) are those that could occur as a result of effluent discharge regulated by a more traditional concentration based approach. Comparing columns 12 and 13 to the CZN Revised Objectives in column 16, even with a suitable increase in predicted concentrations to provide a margin for normal water treatment process variations, there would be no exceedances of the CZN Revised Objectives. Therefore, CZN submits that the Review Board can confidently conclude that significant adverse impacts will be avoided.

Most of the CZN Revised Objectives shown in column 16 in Table 1 are significantly lower than the CZN Proposed Objectives. Objectives for iron, selenium and TDS are the same because the concentrations equal sound RCA benchmarks.

CZN and AANDC have been collaborating on a process to produce SSWQO's that are achievable and protective, and that all parties can have confidence in.

Since the Public Hearing, CZN has committed to provide additional water storage, and to improve the treatment of process water to attain lower effluent concentrations. These changes, when implemented, should result in lower predicted receiving water concentrations. Therefore, CZN has included the effects of these potential changes into the proposed process going forward. Additionally, the process will take into account the operational variability of discharge as well as the method of discharge regulation.

Ecosystem Change

There is a lack of evidence on the record of the EA clearly defining what would constitute ecosystem change. In our opinion, the CZN Revised Objectives provide a substantial safety factor in the form of concentrations well below the lowest concentrations anticipated to result in a toxic response. This should be sufficient to avoid significant change in the downstream ecosystem. However, in any assessment of ecosystem change, consideration needs to be given to the natural water quality signature of mineralization in the Prairie Creek drainage basin, and the current downstream water quality. We know that the vein structure hosting mineralization at the mine naturally discharges mineralized water. The structure is likely the dominant mineralized signature in the basin. Unfortunately, the magnitude of this signature is uncertain because there are other discharges from the mine site caused by anthropogenic changes. However, the current downstream water quality has been in existence for over 30 years since the mine was established, although CZN acquired a Class B Water License and commenced treatment of mine water in 2006. Any assessment of ecosystem change should consider this water quality as the current reference point. For example, the downstream mean concentrations of arsenic, antimony and total phosphorous (column 5, Table 1) exceed the current RCA benchmarks (column 3).

Post-EA Framework for Establishing SSWQO's

As a result of the collaborative approach taken, AANDC submitted to the Review Board a revised framework for establishing SSWQO's, and a terms of reference (TOR) for Site Specific Ecological Risk Assessments (SSERA's, in their September 13, 2011 submission. In general, CZN agrees with the process set out. However, we differ on a few small points as well as the scope and application of the SSERA's. Our proposed framework is given in Attachment 1. Again, CZN's compromise on this matter does not lessen our conviction that meeting the CZN Revised Objectives will avoid significant adverse impacts.

CZN agrees to perform SSERA's on AOC's whose predicted concentrations, depending on the approach adopted to set EQC's, do not meet confirmed RCA benchmarks (after more data has been gathered). A terms of reference for the SSERA's is given in Attachment 2. We believe the SSERA's should be conducted on AOC's so defined in Step 6 of the attached Framework, before the assumption of additional water storage and process water treatment options, rather than in Step 11 (of AANDC's Framework) afterwards. Our belief is that the results of the SSERA's should be considered and used in the selection of the specific additional water storage and process water treatment options. Our rationale is that, provided risk-based values can be met, the project should not be required to implement the most expensive options. For example, water treatment testing might show that lime/sulphide pre-treatment followed by filtration and ion exchange would produce an effluent quality only very slightly better than the other option of sulphide-lime precipitation followed by filtration only. However, the cost differential between the options could be substantial. It would not make economic sense to adopt the most expensive solution if the less-expensive one would allow risk-based objectives to be met.

It should also be noted that the Framework will not result in proposed SSWQO's any higher than the concentrations in column 16 of Table 1. We believe these concentrations will ensure avoidance of significant adverse impacts and the absence of significant ecosystem change.

The information above is respectfully provided so as to form part of the basis for the Review Board's decision on the project.

Yours truly,
CANADIAN ZINC CORPORATION

David P. Harpley, P. Geo.
VP, Environment and Permitting Affairs

TABLE 1: SUMMARY OF PRAIRIE CREEK EXISTING AND PREDICTED WATER QUALITY DURING MINE OPERATIONS (mg/L)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Prairie Creek						CZN Proposed Objectives	Treated Mine Water	Treated Process Water	Mill Ditch	Highest Predicted Concentrations+				CZN Revised Objectives
	Up-stream*			Down-stream#							At Harrison Creek		At Park		
											Creek Flow		Creek Flow		
	Mean	RCA Mean+2SD*	%<DL	Mean	RCA Mean+2SD*	%<DL					Mean	Low	Mean	Low	
Ag	0.00002	0.00229	87	0.000040	NA	80	0.0001	<0.00002	0.0007	0.00005	0.000021	0.000021	0.000021	0.000021	0.00005
As	0.00012	0.00028	30	**0.000210**	0.000465	0	0.005	0.0028	0.009	0.0008	0.00020	**0.00042**	0.00019	**0.00040**	0.001
Cd	0.000031	0.000086	26	0.000033	0.000131	0	0.00038	0.00004	0.0243	0.00035	0.000076	0.000084	0.000071	0.000079	0.0002
Cu	0.00047	0.00243049	20	0.00035	0.00114	0	0.004	0.0072	0.071	0.0022	0.00075	0.00130	0.00072	0.00123	0.00243
Fe	0.036	0.163	0	0.087	0.744	0	0.163	0.021	5.4	0.044	0.046	0.046	0.045	0.045	0.163
Hg	0.0000026	0.000027	88	NA	NA	ND	0.000026	<0.00002	0.0019	0.000028	0.000006	0.000007	0.000006	0.000007	0.000015
Pb	0.00011	0.00090	39	0.00017	0.00122	5.3	0.007	0.0017	0.304	0.0232	0.00071	0.00090	0.00065	0.00090	0.002
Sb	0.00010	0.00019	40	**0.00013**	0.00019	0	0.02[1]	0.0253	0.119	0.0022	**0.00089**	**0.00298**	**0.00081**	**0.00271**	0.005
Se	0.00116	0.00208	11	0.00075	0.00143	0	0.00208	0.0033	0.039	0.0024	0.00128	0.00147	0.00126	0.00144	0.00208
Zn	0.0055	0.0190	11	0.0042	0.0107	0	0.035	0.017	1.35	0.053	0.0083	0.0101	0.0080	0.0097	0.02
NH^{3} N	0.0068	0.0419	65	0.0037	NA	86	0.409	0.69[2]	0.29	0.054	0.023	**0.085**	0.022	**0.078**	0.2
NO^{3} N	0.244	0.903	0	0.117	0.29	0	2.9	5.354[2]	<2	0.419	0.365	0.828	0.353	0.774	2
NO^{2} N	0.001	1.03	79	0.40	NA	75	0.06	0.013[2]	<0.5	0.001	0.002	0.003	0.002	0.002	0.02
Tot. P	0.0026	0.0092	58	**0.0105**	0.048	62	0.004	0.0033[3]	0.230	0.005	0.0030	0.0031	0.0030	0.0031	0.004
SO^{4}	67.0	103.5	0	56.2	78	0	200	470	4500	110	84.1	**115.7**	82.4	**111.3**	150
TDS	263.7	356.7	0	220	276	0	356.7	700	6100	380	284.1	319.8	282.0	314.7	356.7

* Means from existing database, non-detections for each parameter assigned a value half the lowest detection limit

Bold = Exceeds Upstream RCA

Old NNPR boundary, means from existing EC 2003-2008 database, non-detections for each parameter assigned a value half the lowest detection limit

+ Based on 'Low Estimate', 'Best Estimate' and 'High K' mine flow simulations for mine operations as envisaged at the Public Hearing

ID = Insufficient Data   ND = No Data   1 Ontario guideline   2 Diavik underground water   3 Factored from Diavik STP

September 15, 2011

Attachment 1

CZN's Framework for Establishing SSWQO's

**CZN'S PROPOSED PROCESS FOR DERIVING SSWQO'S
FOR PRAIRIE CREEK MINE**

1. Evaluate and select final discharge strategy to be used during operations.

   - Concentration-based approach (fixed EQC).
   - Load-based approach (variable EQC's based upon flow rates)*.

   * This final discharge strategy is preferred, but the ability to regulate it must be confirmed.

2. Estimate highest predicted concentrations[1] under selected discharge strategy at the edge of the initial dilution zone.

   * Corresponding EQC must, at a minimum, comply with any applicable federal legislation at the end-of-pipe.

3. Confirm Reference Condition benchmarks.

   - Inclusion of any additional and relevant datasets.
   - Evaluate whether or not the concentrations of parameters change between summer and winter or among different locations upstream or downstream of the Prairie Creek mine.
   - Transparent treatment of data-points less than detection limits.
   - Consideration of bias in estimated RCA benchmarks due to unequal number of data-points by location and/or season.
   - Identify data quality and data gaps.
   - Consider use of data from both above and below Harrison Creek and from Harrison Creek itself.

4. For confirmed RCA benchmarks, proceed to step 5.

   - For parameters requiring additional data collection due to detection limit issues, poor quality data, etc., data collection should commence immediately, and continue until a suitable time in the permitting process to allow for timely submissions to the Water Board regarding final SSWQO's.

5. Compare highest predicted concentrations[1] to confirmed RCA benchmarks.

   - Recommend RCA benchmarks as SSWQO's at the end of the initial dilution zone for parameters which can be met by the currently envisaged operations. This is based on the highest predicted receiving water concentration[1] at the edge of the initial dilution zone (i.e. mixing zone) in Prairie Creek.

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6. Identify parameters that do not meet the requirements outlined within Step 5. Parameters so identified to undergo Site Specific Ecological Risk Assessments (SSERA's). The SSERA's will be conducted with respect to direction provided by the Review Board within their Report of Environmental Assessment.

   SSERA's to be conducted for parameters identified and Hg and Se, in accordance with the terms of reference provided by CZN, subject to any changes indicated by the Review Board within their Report of Environmental Assessment.

7. Also for parameters identified within step 6, conduct an evaluation of which water treatment and/or storage options could be implemented to achieve confirmed RCA benchmarks. At a minimum, the following items would be considered:

   - Capital and operating costs
   - Desktop evaluation of water treatment options for process water
   - Best available treatment technologies
   - Options for available water storage expansion

8. Step 7 has been completed. Water storage expansion is considered feasible, either in the existing pond or in a second pond. CZN has committed to one of these. After screening, cost effective process water treatment options consist of an enhanced version of the currently proposed system, and a precipitation/ion exchange system. Again, CZN has committed to adopt one of the two. These two treatment options will be subjected to further analysis and laboratory testing to generate expected effluent quality.

9. Derive highest predicted concentrations[1] for each of the four additional treatment and storage option combinations. Consider the resulting concentrations in light of the results of the SSERA's, given that the SSWQO's will be set such that neither the risk-based parameter concentrations nor the CZN Revised Objectives can be exceeded. Decide which additional treatment and storage option combination should be adopted* and recommend final SSWQO's for those parameters that did not meet RCA benchmarks in Step 5.

   * The options resulting in lower predicted concentrations will be selected provided that the predicted concentrations associated with those options are clearly superior to those associated with the alternative options, and are clearly superior in terms of reduced risk.

10. Back-calculate corresponding effluent quality criteria from the final SSWQO's recommended in Steps 5 and 9.

[1] The term "highest predicted concentrations" means discharge water quality based on the available data with an acceptable treatment process variability factor built in.

Attachment 2

CZN's Terms of Reference for SSERA's

Prairie Creek - Risk Assessment Terms of Reference

Canadian Zinc Corp (CZN) is proposing to place the Prairie Creek Mine into operation. The mine water balance will necessitate an effluent discharge, as such, as part of the environmental assessment (EA) process, consideration is being given to the derivation of appropriate site-specific water quality objectives (SSWQOs).

Some parties to the EA believe that all SSWQOs should be established based on CCME's background approach (i.e., the Reference Condition Approach [RCA]-derived objectives),. This is based on the premise that meeting RCA benchmarks will minimize the risk of significant change to the ecosystem and preserve ecological integrity. However, CZN does not believe the mine will be able to consistently meet RCA-derived objectives for a number of analytes-of-concern (AOCs), and does not believe it is necessary to avoid significant impacts or ecosystem change. For these AOCs, CZN has proposed toxicity-based SSWQOs that are lower than established guidelines for the protection of aquatic life, to ensure no significant impacts.

For AOCs that do not meet the RCA benchmarks, environmental risk assessments (ERA) are proposed, the scope and objectives of which may be subject to direction given by the Review Board in their Report of Environmental Assessment. The Review Board may define what would be considered an acceptable level of change in Prairie Creek downstream of the mine. The risk assessment would then be conducted in accordance with the Board's decision. This document provides a terms-of-reference for a suitable ERA, which would be conducted using the ERA guiding principles provided by CCME (i.e., CCME 1996, 1997).

The goal will be that consistently achieved final SSWQOs will result in no significant shifts in the ecological functioning of Prairie Creek as a result of an operating mine discharging effluent .

The list of AOCs being considered in the environmental assessment were derived in two steps. First, predicted downstream concentrations were screened against the CCME and other water quality guidelines (see DAR 2010); this resulted in an initial set of AOCs for cadmium, copper, lead, selenium and zinc. Later in the EA process at the Information Request stage, requests were made to include additional AOCs (EC-14, INAC07 and Parks_Canada_45). Consequently, iron, arsenic, silver, antimony, mercury, ammonia, nitrate, nitrite, phosphorus and TDS were added.

Problem Formulation

The risk assessment will begin with a Problem Formulation (PF). The PF will explicitly define the potential environmental risks, including the three components of risk: chemical hazard; exposure pathway; and receptors.

Specifically, the PF will contain sections on the regulatory setting, the physical site setting, the AOCs (including an explanation of how they were selected), ecological resources and an analysis of potential exposure pathways.

Regarding receptors and physical site setting, consideration will be given to the fact that:

1. The site is montane and located at high latitude and that ecological resources may differ from more temperate environments;

2. Flow of water in the creek is rapid and highly variable in rate and clarity;

3. Flows tend to be flashy and result in significant erosion of banks and stream bed material;

4. The creek is covered with ice for several months of the year;

5. There is a species-at-risk within the creek (Bull trout), and other species (terrestrial) may rely on the creek for food or water;

6. A few aboriginal people fish for Arctic grayling in pools in Prairie Creek near its confluence with the South Nahanni River; and

7. Prairie Creek flows into and through the Nahanni National Park Reserve.

A conceptual model will be used to integrate the information gathered and will demonstrate all potential linkages between chemical hazards and receptors. Using the conceptual model, assessment and measurement end-points will be derived. The assessment end-points will define the ecological attributes of Prairie Creek to be protected. Expressed in the form of a question, the primary assessment end-points identified to date are as follows:

- Will the fish, specifically Arctic grayling, be safe to eat?

- Will fishing success (i.e., catch per unit effort) decrease?

- Will there be toxicity or behavioural effects to bull trout migrating through Prairie Creek?

- Will there be an accumulation of contaminants into piscivorous animals?

The selection of final assessment end-points will account for any direction given on the subject by the Review Board. Once the assessment end-points have been chosen, measurement end-points will be derived. Measurement end-points are the tools/approaches used to answer the assessment end-point questions. Examples of measurement end-points include:

- Literature assessment of toxicity (or other effects);

- Toxicity testing;

- Measurement of AOCs in water and fish tissue;

- Mathematical modelling; and

- Fish health and benthic community assemblage indices.

For the purpose of the environmental risk assessment, the area to be assessed will include Prairie Creek downstream of the initial dilution zone to its confluence with the South Nahanni River.

Effects assessment

It is anticipated that the potential risks associated with many of the AOCs will be addressed within a literature-based effects assessment. Effects data available in the scientific literature will be compiled and compared to the proposed toxicity-based SSWQOs proposed by CZN. These objectives were derived by applying a safety factor to the Canadian environmental guidelines, after confirmation that these guidelines were protective of northern species likely to be present in the Prairie Creek watershed (CCME guidelines, or other toxicity benchmarks where CCME guidelines were not available).

Data gathered within the literature-based effects assessment will include several sources, including USEPA's EcoTox database, recent Environment Canada data compilations (where available), and online literature databases. Where possible, the data collected will emphasize species resident to Prairie Creek, and/or other species that commonly inhabit cool swift moving streams. The effects assessment will be largely toxicity-based; however, population and community-level effects will be considered where data are available. An evaluation of toxicity data will focus on sub-lethal and chronic toxicity end-points. Potential data gaps including behavioral/avoidance thresholds for migrating bull trout will be considered.

The assessment will also consider the potential for additive or synergistic effects among analytes. This will be done by reviewing recent scientific literature on the subject, as well as reviewing the results of sub-lethal toxicity tests using simulated treated effluent.

The criteria for inclusion of data in the literature-based effects assessment is as follows:

- Data will be adopted if they are proposed by USEPA (i.e., EcoTox database) or by Environment Canada.
- For other remaining data, the CCME (2007) guidance on data acceptability will be followed.

Additional toxicity testing may be considered if the review of existing data does not sufficiently address the potential issue.

Exposure assessment

The exposure assessment will assess the potential accumulation of AOCs in Prairie Creek downstream of the mine. Bioavailability of individual AOCs in Prairie Creek will also be assessed, where appropriate. The assessment will also consider seasonal variation in exposure concentration, and potential water treatment/storage scenarios (each will influence the nature of effluent release). Bioaccumulation of mercury and selenium will need to be assessed in a quantitative manner, likely requiring the use of accumulation factors or mathematical/statistical models. Potential exposure of wildlife consumers of fish will also be considered.

Risk characterization

The risk characterization will integrate the effects and exposure assessment into an explicit quantitative description of environmental risk for Prairie Creek. The risk assessor will consider the use of a probabilistic analysis approach, but deterministic (single-point) estimates are acceptable as well as long as a range of exposure and effects are considered. At a minimum, a worst-case and an average condition will be assessed.

Uncertainty analysis

An uncertainty analysis will discuss assumptions and uncertainties associated with the risk assessment. A consideration of uncertainty specific to biotic assemblages and keystone species within Prairie Creek will be included as part of the analysis, and whether species/populations living in northern aquatic ecosystems exhibit greater sensitivity to contaminants.

References

Canadian Council of Ministers of the Environment (CCME), 1996. A Framework for Ecological Risk Assessment: General Guidance, The National Contaminated Sites Remediation Program, CCME Subcommittee on Environmental Quality Criteria for Contaminated Sites, Winnipeg, Manitoba, PN 1195.

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CCME, 2007. A Protocol for the Derivation of Water Quality Guidelines for the Protection of Aquatic Life. 2007, Canadian Council of the Ministers of the Environment.

Canadian Zinc Corp (CZN), 2010. Developers Assessment Report.
Submitted to the Mackenzie Valley Review Board by Canadian Zinc Corporation in support of the Environmental Assessment of Prairie Creek Mine EA 0809-002, March 2010.