Fisheries and Oceans Canada | Pêches et Océans Canada

301-5204 50th Ave.
Yellowknife, NT
X1A 1E2

January 25, 2016

Your file *Votre référence*
EA1415-01

Our file *Notre référence*
08-HCAA-CA6-00114

Mackenzie Valley Environmental Impact Review Board
ATTN: Sachi De Souza
Environmental Assessment Officer
P.O. Box 938, #200 Scotia Centre
5102-50th Ave., Yellowknife, NT
X1A 2N7

Dear Ms. De Souza:

Subject: Information Requests – Prairie Creek All Season Road Project – EA1415-01

Fisheries Protection Program of Fisheries and Oceans Canada (DFO-FPP) would like to thank the Mackenzie Valley Environmental Impact Review Board for the opportunity to provide comments on the Developer's Assessment Report (DAR) and the DAR Addendum (collectively, the DAR) provided by Canadian Zinc Corporation (CZN).

As outlined in your request dated December 21, 2015, interested parties are invited to provide information requests (IRs) directed to the Proponent and/or other parties to the Mackenzie Valley Environmental Impact Review Board by January 29, 2016.

DFO-FPP has reviewed CZN's DAR and has prepared IRs (attached) according to the format requested by the Mackenzie Valley Environmental Impact Review Board (*Environmental Impact Assessment Guidelines*, 2004, Appendix F).

If you have any questions, please contact Julie Marentette at 867-669-4934, or by email at Julie.Marentette@dfo-mpo.gc.ca. Please refer to the file number referenced above when corresponding with DFO-FPP.

Yours sincerely,

Julie Dahl
Regional Manager, Regulatory Reviews
Fisheries Protection Program

ATTACHMENT LIST:

08-HCAA-CA6-00114 DFO Information Request Prairie Creek DAR.doc

COPY LIST:
Julie Marentette (DFO)

Fisheries and Oceans Canada

Information Requests

Prairie Creek All Season Road Project EA1415-01

Submitted to:
Mackenzie Valley Environmental Impact Review Board (MVEIRB)

January 25, 2016
DFO File No.: 08-HCAA-CA6-00114

Information Requests

IR Numbers	**1a-b**
To	Canadian Zinc Corporation
Subject	Watercourse Crossings – Road Km Names
Reference	DAR Main Report, Table 4-2, Table 4-10, Appendices 1A, 3, 4, and 9; DAR Addendum and Appendices A and C
Terms of Reference Section	6.2 Road Design Considerations
Preamble	Fisheries and Oceans Canada notes that in various documents, generated at with dates, in both the DAR and DAR Addendum, different road km are assigned to watercourse crossings. Fisheries and Oceans Canada understands that road alignments evolve over time and that differences among documents are therefore difficult to avoid completely. While in many cases, the watercourse crossing can still be identified and cross-referenced with only small differences in road km number (e.g., a crossing of Sundog Creek at 28.8 or 28.9 road km), others are less clear. For example, focusing on fish-bearing streams, the Casket Creek Crossing identified in the DAR Main Report Table 4-2 as road km 6.1 is also identified in DAR Appendix 1A as 6.2 road km, with a separate, non-fish-bearing road crossing listed as 6.1 road km that does not appear in Table 4-2. Two crossings of the Polje Creek system (mainstem and tributary) that are in close succession are listed as 53.6 and 53.65 road km in Table 4-2, but Table 4-10 lists them as 53.5 and 53.6, Appendix 1A actually lists three crossings in the same portion of the road at 53.6, 53.65 and 53.7 road km, Appendix 4 and 9 identify a crossing at 53.5 road km, and Appendix 1 and 3 of the DAR Addendum refer to either one crossing at 53.7 road km or two at 53.5 and 53.6 road km. Table 4-10 in the DAR Main Report lists a crossing of a Liard tributary at 151.3 road km that does not appear in Table 4-2. Appendix 1A of the DAR lists additional crossings of the Grainger River at 126.4 and 126.5 road km that do not appear in Table 4-2. Appendix 3 of the DAR Addendum indicates that a crossing at road km 63.6 at the inlet to Mosquito Lake may provide some habitat to fish, but Table 4-2 of the DAR Main Report identifies this crossing as

	having no fish.
Information Requests	**1a** Please provide a finalized table of all watercourse crossings, including the road km to be used throughout the Environmental Assessment process to uniquely identify each crossing, the water body crossed, its fish-bearing status (Y/N/?) and the type of crossing (major = bridge, minor = culvert(s), or barge) to be constructed at each location. For fish-bearing status, please differentiate between positive designations determined by the Developer, versus positive designations known by historical records. For crossings at streams considered to be non-fish-bearing, please identify the reason (i.e., downstream barrier to fish passage, no channel, etc.) **1b** For each of the specific examples identified above (i.e., crossings at 6.1/6.2 road km, the crossings near 53 road km, and the crossings that either do not appear in Table 4-2 at all, or may have been mistakenly classified according to fish-bearing status), please clarify the discrepancies identified by Fisheries and Oceans Canada.

IR Numbers	**2a-b**
To	Canadian Zinc Corporation
Subject	Project Footprint Uncertainty – Water Crossings including Liard River Barge Crossing
Reference	DAR Main Report, p. 245-6, and Appendix 1A, p. 61-4 (with sub-Appendix B); DAR Addendum, Appendix A and C
Terms of Reference Section	6.2 Road Design Considerations, 7.3.7 Fish and Aquatic Habitat
Preamble	The Developer notes on p. 246 of the DAR Main Report that any habitat losses will be replaced to the satisfaction of DFO as a requirement of the *Fisheries Act*. Across various documents presented in the DAR and DAR Addendum, approximately 19—23 water crossings, including the Liard River Barge Crossing, affect fish-bearing or suspected fish-bearing watercourses. DAR Appendix 1A and DAR Addendum Appendix A both indicate that there are 10 clear-span bridges to be constructed or enlarged that will require bank stabilization and rock armouring at one or both approaches. It is not clear from sub-Appendix B how much, if any, of this armouring extends below the high water mark for any crossing. The Liard River Barge Crossing will require the construction of rock ramps that will extend below the high water mark (Appendix 1A, p.

	61), and possible dredging (DAR Main Report, p. 245) although this now appears unlikely (DAR Addendum, App. C, p. 16). The remainder of crossings will consist of culverts, backfill and armouring that will extend, to some extent, below the high water mark of various fish-bearing streams (Appendix 1A, p. 64 and sub-Appendix B).
Information Requests	**2a** For each of the fish-bearing water crossings to be provided in a table in response to IR 1 above, please indicate the estimated Project footprint below the high water mark, in square meters. To assist Fisheries and Oceans Canada in our review, the footprint should ideally be in two categories. *Habitat loss* attributed to infilling (rock-armouring and bank stabilization, ramps or bridge abutments if applicable) should be classified separately from *habitat alteration* (culverts – the area in the bottom portion of the culvert to be refilled with natural substrates once the culvert has been embedded, and dredging; i.e., where habitat remains accessible to fish after construction). **2b** Please confirm that dredging in the Liard River is no longer required.

IR Numbers	**3a-b**
To	Canadian Zinc Corporation
Subject	Project Footprint Uncertainty – Watercourses Parallel to Road
Reference	DAR Main Report, p. 193-4; DAR Addendum p. 66-7
Terms of Reference Section	6.2 Road Design Considerations, 7.3.7 Fish and Aquatic Habitat
Preamble	Section 9.4 of the DAR Main Report (p. 193) and Table 9-2 (p. 194) indicate that a number of road sections appear to be immediately adjacent to watercourses such as Prairie Creek, Fast Creek and Sundog Creek (i.e., within 1-2 m). On p. 148, the Developer indicates that at km 35.1, the road will need heavy armour for protection from the adjacent Sundog Creek. On p. 245, the Developer notes that the road may be widened for the Prairie Creek and Funeral Creek portions where the road already exists, but that "no important [fish] habitat will be lost due to the road, other than in lower Sundog." In the DAR Addendum, the Developer notes that "road construction and operations pose risks regarding

	sediment production and water quality impact" but that apart from Prairie Creek and Funeral Creek, "the remainder of the road is generally not proximal to watercourses except at crossings" (p. 66-67). It is not clear from these descriptions whether there will be infilling or other works associated with construction, including the operation of machinery, staging areas, and/or installation of sediment and erosion control structures occurring below the high water mark of any fish-bearing stream sections that are not associated with a water crossing along the entire length of the proposed all-weather access road.
Information Requests	**3a** Please indicate the location and project footprint, in square meters, of any infilling (road widening, rock armouring, etc.) below the high water mark resulting from the Project in areas where the road runs parallel to a fish-bearing watercourse (i.e., not associated with a water crossing). This information should be accompanied by a habitat assessment in areas subjected to any infilling (including habitat type and quality, fish species). **3b** Please identify any overlap with areas previously impacted by infilling of 1225 square meters of fish habitat and Prairie Creek and Funeral Creek, associated with the Developer's *Fisheries Act* Authorization SC04006.

IR Numbers	**4a-b**
To	Canadian Zinc Corporation
Subject	Project Footprint Uncertainty – Sundog Stream Realignment
Reference	DAR Main Report, p. 148, Figures 6-2, 6-3
Terms of Reference Section	6.2 Road Design Considerations, 7.3.7 Fish and Aquatic Habitat
Preamble	The footprint (size and extent) of the proposed Sundog Stream Realignment is not clear. The DAR Main Report states (p. 148) that "from Km 36 to 36.3, 37 to 37.2, and 37.7 to 37.9, the channel is against the bank and will need to be realigned." This text might suggest that approximately 700 m of Sundog Creek is proposed to be realigned, in three sections. However, Figures 6-2 and 6-3 of the DAR Main Report indicate that the alignment is more extensive, affecting several kilometers of Sundog Creek in area of 37-39 road

	km. The DAR Addendum (section 7.6) states that "the intent during construction would be to create the shape of the existing channel" but that the "dimensions of the new channel will depend on flows, but would be comparable to the old channel." Surveyed references for excavations are not planned to be obtained until further site investigation and detailed designs are generated by the Developer.
Information Requests	**4a** Please provide the project footprint of the Sundog Stream Realignment. This should include the affected length of Sundog Creek, the type and quantity of habitat loss expected due to infilling (all portions of the existing Sundog Creek section that will be infilled, in square meters), as well as the type and quantity of habitat gain to be obtained in the excavated Stream Realignment (in square meters, as well as the dimensions and depth profile of the Realignment). **4b** Fisheries and Oceans Canada agrees with the Developer that the absolute shape of the Stream Realignment will evolve over time in a dynamic system. Therefore, please provide the estimated footprint, depth profile and dimensions of the Realignment at time of initial construction (or the range in which these dimensions may vary, for the purposes of assessment), as well as comparable data, assessments or predictions for the dimensions of the channel post-construction once scour has occurred along the south bank.

IR Numbers	**5a-c**
To	Canadian Zinc Corporation
Subject	Hydrology – Sundog Stream Realignment
Reference	DAR Main Report, p. 242, DAR Addendum p. 65
Terms of Reference Section	6.2 Road Design Considerations, 7.3.7 Fish and Aquatic Habitat
Preamble	The Developer has suggested that the proposed Sundog Stream Realignment will not alter the hydrology of Sundog Creek. Concerns have been expressed that the Realignment "may result in a change to the surface area for flow to be conveyed, and in turn, the volumetric flow rate…. The surface area for flow and flow rate is always determined by recent climate conditions and runoff. Channel realignment will not alter that" (DAR Addendum, p. 65). However, Fisheries and Oceans Canada notes that without a more

	complete hydrological description of the proposed Sundog Creek Realignment, including the dimensions of the newly-constructed channel as well as the existing portion of the creek to be infilled, and estimates of how the channel shape, size and velocity will evolve over time given that it is to be armoured along one bank, potentially repeatedly as armour is lost in the alluvium (DAR Addendum, p. 62), the Developer's position cannot be verified. There is also the potential for concerns regarding the stability of the proposed Realignment in a highly dynamic system. As noted in the DAR Main Report (p. 242), "the channels [in the braided Sundog Creek] change from year to year naturally."
Information Requests	**5a** Please provide a hydrological assessment of the proposed Sundog Creek Realignment, indicating the frequency with which repairs to armouring along the south bank are expected to be necessary, and how often additional work below the high water mark will be required to maintain channel stability over the life of the project. References to other completed projects for comparison can also be provided as examples, if the Developer is aware of similar successful realignments. **5b** Please provide information on how total suspended solids (TSS) in Sundog Creek due to realignment activities, which may settle on downstream fish habitat, will be managed. **5c** Please provide information as to whether the Realignment will result in the increased stranding of Arctic Grayling or Slimy Sculpin compared to baseline conditions. This may occur if large amounts of pool habitat in the Realignment are expected to be created by excavation or maintained/encouraged by the placement of boulders, which generate scour, or if there is a reduction in the expected number of days of flow per year in the Sundog Creek system.

IR Numbers	**6a-b**
To	Canadian Zinc Corporation
Subject	Project Design – Sundog Stream Realignment
Reference	DAR Main Report, p. 148, DAR Addendum p. 62
Terms of Reference Section	6.2 Road Design Considerations, 7.3.7 Fish and Aquatic Habitat

Preamble	The Developer has changed the high-level design concept of the Sundog Stream Realignment from a series of large boulders, placed to increase scour and maintain the realigned channel in its new position (DAR Main Report, p. 148), to instead armour the south bank of the realignment (DAR Addendum, p. 62). This change was made partly for logistical reasons and partly because of the risk of flow diversion to the south, closer to the road. Fisheries and Oceans Canada notes that the Arctic Grayling migrate within Sundog Creek (DAR Main Report, p. 99) and two assessed locations within the proposed realignment area may provide rearing and/or spawning habitat for either Arctic Grayling or Slimy Sculpin (DAR Addendum, Appendix C, Attachment A, p. 5-6).
Information Requests	**6a** Please clarify whether any boulders will still be placed in the channel bed, apart from armouring, along the length of the proposed Realignment channel, in order to facilitate scour and pool formation in locations that are not along the armoured south bank. **6b** Please provide information on the risk that continuous scouring along the south bank of the proposed armoured Stream Realignment may create a deeper, narrower and potentially higher-velocity channel than intended, which may form a velocity barrier to fish passage for Arctic Grayling moving up Sundog Creek to spawn.

IR Numbers	**7**
To	Canadian Zinc Corporation
Subject	Dust Deposition in Watercourses
Reference	DAR Main Report, p. 239-240
Terms of Reference Section	6.2 Road Design Considerations, 7.3.7 Fish and Aquatic Habitat
Preamble	The Developer states that “The primary dust-related effects… are anticipated to occur within about 10 m of the main development” and “effects on waterbodies from dust are expected to be minimal. The road is proximal to or crosses many stream, but the limited amount of dust will be carried in flowing water and settle as sediment, adding only a small increment to the bed load” (DAR Main Report, p. 239-40).

Information Requests	**7** Please provide the predicted dust deposition rates (e.g., in $mg/dm^2/day$), the affected water bodies and the areas of the affected water bodies located within 10 m of the road that may be subject to dust deposition, and the incremental addition of dust to the total suspended solids (TSS) load of water courses as a result of construction, operation and decommissioning of the all-weather access road.

IR Numbers	**8a-c**
To	Canadian Zinc Corporation
Subject	Blasting
Reference	DAR Addendum Appendix C Attachment A (p. 11)
Terms of Reference Section	6.2 Road Design Considerations, 7.3.7 Fish and Aquatic Habitat
Preamble	The Developer states that "blasting will only occur in four locations, three in Sundog Creek and one in Grainger River. Two of the Sundog locations are not fish-bearing. The other, and the Grainger location, host grayling, a spring spawner. Blasting will not occur in the spring" (DAR Addendum, App. C p. 11). Further on, the Developer indicates that mitigation for blasting will also including "encouraging fish to move from the blast area."
Information Requests	**8a** Please clarify the times of year when blasting will be used. **8b** Please clarify how fish will be removed or excluded from blast areas, the time of year at which this will occur, and for what period of time fish will be excluded from access to fish habitat. **8c** Please clarify that blasting near fish-bearing watercourses will adhere to Fisheries and Ocean Canada's Measures to Avoid Harm available on our website (http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html). Please also note that it is recommended that blasting not result in instantaneous pressure changes of > 50 kPa in areas of fish habitat to avoid negative impacts to fish and fish habitat, including adult fish.

Summary of Information Requests

1. Watercourse Crossings – Road Km Names	
1a	Please provide a finalized table of all watercourse crossings, including the road km to be used throughout the Environmental Assessment process to uniquely identify each crossing, the water body crossed, its fish-bearing status (Y/N/?) and the type of crossing (major = bridge, minor = culvert(s), or barge) to be constructed at each location. For fish-bearing status, please differentiate between positive designations determined by the Developer, versus positive designations known by historical records. For crossings at streams considered to be non-fish-bearing, please identify the reason (i.e., downstream barrier to fish passage, no channel, etc.)
1b	For each of the specific examples identified above (i.e., crossings at 6.1/6.2 road km, the crossings near 53 road km, and the crossings that either do not appear in Table 4-2 at all, or may have been mistakenly classified according to fish-bearing status), please clarify the discrepancies identified by Fisheries and Oceans Canada.
2. Project Footprint Uncertainty – Water Crossings including Liard River Barge Crossing	
2a	For each of the fish-bearing water crossings to be provided in a table in response to IR 1, above, please indicate the estimated Project footprint below the high water mark, in square meters. To assist Fisheries and Oceans Canada in our review, the footprint should ideally be in two categories. *Habitat loss* attributed to infilling (rock-armouring and bank stabilization, ramps or bridge abutments if applicable) should be classified separately from *habitat alteration* (culverts – the area in the bottom portion of the culvert to be refilled with natural substrates once the culvert has been embedded, and dredging; i.e., where habitat remains accessible to fish after construction).
2b	Please confirm that dredging in the Liard River is no longer required.
3. Project Footprint Uncertainty – Watercourses Parallel to Road	
3a	Please indicate the location and project footprint, in square meters, of any infilling (road widening, rock armouring, etc.) below the high water mark resulting from the Project in areas where the road runs parallel to a fish-bearing watercourse (i.e., not associated with a water crossing). This information should be accompanied by a habitat assessment in areas subjected to any infilling (including habitat type, fish species, quality).
3b	Please identify any overlap with areas previously impacted by infilling of 1225 square meters of fish habitat and Prairie Creek and Funeral Creek, associated with the Developer's *Fisheries Act* Authorization SC04006.
4. Project Footprint Uncertainty – Sundog Stream Realignment	
4a	Please provide the project footprint of the Sundog Stream Realignment. This should include the affected length of Sundog Creek, the quantity of habitat loss expected due to infilling (all portions of the existing Sundog Creek section that will be infilled, in square meters), as well as the quantity of habitat gain to be obtained in the excavated Stream Realignment (in square meters, as well as the dimensions and depth profile of the Realignment).

4b	Fisheries and Oceans Canada agrees with the Developer that the absolute shape of the Stream Realignment will evolve over time in a dynamic system. Therefore, please provide the estimated footprint, depth profile and dimensions of the Realignment at time of initial construction (or the range in which these dimensions may vary, for the purposes of assessment), as well as comparable data, assessments or predictions for the dimensions of the channel post-construction once scour has occurred along the south bank.
5. Hydrology – Sundog Stream Realignment	
5a	Please provide a hydrological assessment of the proposed Sundog Creek Realignment, indicating the frequency with which repairs to armouring along the south bank are expected to be necessary, and how often additional work below the high water mark will be required to maintain channel stability over the life of the project. References to other completed projects for comparison can also be provided as examples, if the Developer is aware of similar successful realignments.
5b	Please provide information on how total suspended solids (TSS) in Sundog Creek due to realignment activities, which may settle on downstream fish habitat, will be managed.
5c	Please provide information as to whether the Realignment will result in the increased stranding of Arctic Grayling or Slimy Sculpin compared to baseline conditions. This may occur if large amounts of pool habitat in the Realignment are expected to be created by excavation or maintained/encouraged by the placement of boulders, which generate scour, or if there is a reduction in the expected number of days of flow per year in the Sundog Creek system.
6. Project Design – Sundog Stream Realignment	
6a	Please clarify whether any boulders will still be placed in the channel bed, apart from armouring, along the length of the proposed Realignment channel, in order to facilitate scour and pool formation in locations that are not along the armoured south bank.
6b	Please provide information on the risk that continuous scouring along the south bank of the proposed armoured Stream Realignment may create a deeper, narrower and potentially higher-velocity channel than intended, which may form a velocity barrier to fish passage for Arctic Grayling moving up Sundog Creek to spawn.
7. Dust Deposition in Watercourses	
7	Please provide the predicted dust deposition rates (e.g., in mg/dm^2/day), the affected water bodies and the areas of the affected water bodies located within 10 m of the road that may be subject to dust deposition, and the incremental addition of dust to the total suspended solids (TSS) load of water courses as a result of construction, operation and decommissioning of the all-weather access road.
8. DAR Addendum Appendix C Attachment A (p. 11)	
8a	Please clarify the times of year when blasting will be used.
8b	Please clarify how fish will be removed or excluded from blast areas, the time of year at which this will occur, and for what period of time fish will be excluded from access to fish habitat.

8c	Please clarify that blasting near fish-bearing watercourses will adhere to Fisheries and Ocean Canada's Measures to Avoid Harm available on our website (http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html). Please also note that it is recommended that blasting not result in instantaneous pressure changes of > 50 kPa in areas of fish habitat to avoid negative impacts to fish and fish habitat, including adult fish.

Northwest Territories Lands

FEB 12 2016

Ms. Sachi De Souza
Mackenzie Valley Environmental Impact Review Board
PO Box 938
YELLOWKNIFE NT X1A 2P1

VIA EMAIL

Dear Ms. De Souza:

Canadian Zinc Corporation's Prairie Creek All-Season Road Project Environmental Assessment – GNWT Information Requests (EA1415-01)

Government of the Northwest Territories (GNWT) departments have reviewed the Developer's Assessment Report and Addendum in light of their respective mandates and responsibilities related to the Prairie Creek All-season Road. The GNWT is pleased to provide the attached Information Requests (IRs), and anticipates that responses will assist in informing the Mackenzie Valley Environmental Impact Review Board (MVEIRB) and all parties about the nature and significance of the proposed Prairie Creek project's potential impacts.

The GNWT looks forward to reviewing the additional information to be filed by the developer and to participating in the technical sessions.

If the MVEIRB or any of the parties to this EA have questions about the GNWT's IRs, please contact Lorraine Seale, Manager, Project Assessment Branch, at lorraine_seale@gov.nt.ca or 867-767-9183 ext. 24067, or Véronique D'Amours-Gauthier, Project Assessment Analyst, at Veronique_DAmours-Gauthier@gov.nt.ca or 867-767-9183 ext. 24071.

Sincerely,

Darha Phillpot
A/ Director
Land Use and Sustainability

Attachment

THE PREMIER OF THE NORTHWEST TERRITORIES

AUG 20 2015

Mr. John F. Kearney
Chairman and Chief Executive
Canadian Zinc
SUITE 1710 - 650 WEST GEORGIA STREET
VANCOUVER BC V6B 4N9

Dear Mr. Kearney:

Prairie Creek Mine – Management and Control of Use of Access Road

Thank you for your letter of July 3, 2015 in which you are requesting the Government of the Northwest Territories' (GNWT) assistance in implementing a solution to the management and control of access on a portion of your proposed all-season road from the Liard Highway to the Prairie Creek Mine. Specifically, your proposal would include a three kilometer (km) wide "No Shooting Corridor" along the 58 km of the Prairie Creek Road from the Liard River to the Nahanni National Park Reserve (NNPR).

Based on your letter, the impetus for the all-season road proposal comes from Canadian Zinc's project optimization studies which indicate that "the viability of the Mine would be greatly enhanced with the use of the road on an all season basis."

A "No Shooting Corridor" along Prairie Creek Road would negatively infringe on the constitutionally protected harvesting rights of the Liidlii Kue First Nation and other Aboriginal harvesters who assert harvesting rights in that area. If this were an undertaking conducted by government, it would require consultation with potentially negatively affected Aboriginal governments and organizations, as well as public and stakeholder engagement, with a view to reaching a workable solution.

As noted in your letter, Canadian Zinc's application "to extend the use of the road from a winter only to all season" is currently undergoing Environmental Assessment. Canadian Zinc may be better informed about the prospect of the all-season road after that process concludes in due course.

.../2

LEGISLATIVE ASSEMBLY
YELLOWKNIFE, NT
CANADA X1A 2L9
Telephone (867) 669-2311
Facsimile (867) 873-0385

Ndèts'o K'àowo Gha Nakwee Wheda Weniht'èkò Nan Nį̨k'oo Iisnts'àt Gwichit Gwitr'it Deek'it Ní Ts'én K'aldhër Xa Tthe Theda Ts'į ?enhtł'ís Ghálada K'é

I can advise that there have been no conservation measures identified as necessary in the 58 km of the Prairie Creek Road from the Liard River to the NNPR. Further, as this is a private undertaking by Canadian Zinc to increase the viability of the mine, the GNWT cannot assist in designating a "No Shooting Corridor" along the Prairie Creek Road for this purpose.

That said, the GNWT encourages Canadian Zinc to engage in consultation and public engagement with potentially negatively affected parties at your earliest convenience. It is through these forums that you may be able to gain the support you will require to meet your interests. Additionally, it may be of some assistance to contact other businesses responsible for private road safety, including the Tibbitt to Contwoyto Winter Road and the Gahcho Kue Diamond Project, to see how these projects of a similar nature have addressed similar challenges.

Sincerely,

Robert R. McLeod

c. Mr. Gary Bohnet, Principal Secretary
Office of the Premier

The Honourable J. Michael Miltenberger
Minister of Environment and Natural Resources

The Honourable David Ramsay
Minister of Industry, Tourism and Investment

The Honourable Robert C. McLeod
Minister of Lands

Grand Chief Herb Norwegian, Dehcho First Nations

Chief Gerald Antoine, Łıdlı Kue First Nation

Chief Michael Matou, Nahanni Butte Dene Band

Mr. Kevin Menicoche, MLA, Nahendeh

Canadian Northern Economic Development Agency | Agence canadienne de développement économique du Nord

February 12, 2016

Mark Cliffe-Phillips
Executive Director
Mackenzie Valley Environmental Impact Review Board
200 Scotia Centre – 5102 – 50th Ave
YELLOWKNIFE, NT X1A 2N7

Dear Mr. Cliffe-Phillips,

Subject: Government of Canada Information Requests for the Canadian Zinc Corporation's Prairie Creek All Weather Access Road (EA1415-01)

The Northern Projects Management Office, on behalf of the Government of Canada, is submitting the attached information requests for the Prairie Creek All Weather Access Road Project Developer's Assessment Report.

The submission includes information requests from Environment and Climate Change Canada, Fisheries and Oceans Canada, Parks Canada Agency and Natural Resources Canada. A contact list from federal departments participating in this environmental assessment is also attached.

The Government of Canada looks forward to continued participation in the above noted environmental assessment.

Sincerely,

Matthew Spence
Director General
Northern Projects Management Office

cc. Sachi De Souza, Environmental Assessment Officer, Mackenzie Valley Environmental Impact Review Board

Attachments (2): 1. Federal Contact List (Annex A)
2. Government of Canada Information Requests

Canada

Contact list from Federal Departments for Canadian Zinc Corporation's Prairie Creek All Weather Access Road Project

Environment and Climate Change Canada

Loretta Ransom
Senior Environmental Assessment Coordinator
Tel.: (867) 669-4744
Email: Loretta.Ransom@ec.gc.ca

Fisheries and Oceans Canada

Georgina Williston
Senior Fisheries Protection Biologist
Central and Arctic Region
Tel.: (867) 669-4927
Email: Georgina.Williston@dfo-mpo.gc.ca

Parks Canada

Allison Stoddart
Environmental Assessment Scientist
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Email: Allison.Stoddart@pc.gc.ca

Natural Resources Canada

John King
Senior Policy Analyst, Environmental Assessment Division
Tel.: 343-292-6062
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OBONI RISKOPE ASSOCIATES INC.
2302 WEST FOURTH AVE.
PO BOX 19158 FOURTH AVE.
VANCOUVER, B.C.,
V6K 4R8 CANADA

RISKOPE INTERNATIONAL SA
CP 28
1055 FROIDEVILLE (VD)
SWITZERLAND

Attn: Mr. Alan Ehrlich
Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
Box 938, 5102-50th Ave,
Yellowknife, NT X1A 2N7

EA1415-01 Phase 1: Technical Review; 1.1 Information requests

Introduction

In response to the SOW (EA1415-01 PR142) Oboni Riskope Associates Inc. (the Contractor) has prepared the following questions constituting the Information Requests of Phase 1: Technical review of the Risk Assessment task.

The questions follow the "Standard Format for MVEIRB Information Requests" instructions.

In the texts below any *text written in italics* is a copy of a section from extant public records used as reference. This document contains eight main questions with subquestions.

IR Number: EA1415-01-1-1.1-001
Source: Oboni Riskope Associates Inc.
To: Canadian Zinc Corporation
Subject: General spill risks considerations and mitigations

Preamble:

The DAR summarizes the spill risks possible mitigations as follows:

... Spill risks can be effectively mitigated by good road design and construction, driving in good conditions and at safe speeds, and having suitable spill response procedures in place, including control points and response materials available at key locations along the road. DAR, PR55 Page 11.

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More specifically for spills DAR states, among many other points:

...a supply of soda ash will also be kept at Control Points to neutralize an acid spill. DAR, PR55 page 29.

...the exceptions are concentrates, sodium sulphide and ammonium nitrate, all of which are soluble to some degree and could cause a significant impact if spilled into, or subsequently dissolve into, water. DAR, PR55 page 192.

From Appendix 1 of the Allnorth's "Proposed Prairie Creek Mine Access Road" report we understand *The road construction standards will be consistent with the normal operating approach and standards as defined in the "Northern Land Use Guidelines for Roads and Trails" and the B.C. Forest Engineering Manual (and also with B.C. Ministry of Forests, Lands, and Natural Resources Engineering Handbook for some aspects).* The mitigation statement above leaves ample room for interpretation: "good", "safe", and "suitable" should be specifically defined in order to allow an evaluation of the risks and then the effectiveness of mitigations. What is meant, for example, by "good" road design and construction" is not clear to the reader. It seems that the road construction standards and design are compliant with codes that may not entirely cover the peculiarities of the vehicles and traffic the road under consideration will carry. We have also noted that some prior experience with the winter road has been considered[1], but the absence of accident records from the early '80s is not a proof of safety of any kind, especially since that total traffic does not even represent one year of service of the new project.

Request:

1. Please identify the characteristics that give the foreseen road design and construction the *"good"* attribute stated in the DAR as mitigation as opposed to "code compliant" according to the "Northern Land Use Guidelines for Roads and Trails" and the B.C. Forest Engineering Manual attribute.
2. Please identify what traffic, vehicles and transported materials are foreseen in the the adopted "Northern Land Use Guidelines for Roads and Trails" and the B.C. Forest Engineering Manual codes.
3. Please deliver a list of recorded accidents, incidents, near-misses on winter roads (if records exist, or "experience-based" information), including business interruption and road closures of any kind that may have been considered during the preparation of DAR (See note 1).
4. Please define what *"driving in good conditions"* means in the particular environment of this project (day/night, all seasons meteorology) and transportation cycle duration.

1 DAR Addendum, page 51: *To put the assessment into context, approximately 800 loads were brought into the Mine in the early 1980's over two winter roads in order to construct the Mine. Following two reviews of INAC (as AANDC was known at that time, now part of GNWT) files in Fort Simpson, and conversations with site personnel and drivers from that time, there is no record or any indication of any significant accidents or spills having occurred on the road.*

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5. In addition to the traffic defined in DAR TABLE 9-1 please define a "average estimate" of all miscellaneous daily traffic during the various phases of the project's life such as, for example:
   a) Construction equipment and Oversized vehicles (own and contractors);
   b) Mining personnel and subcontractor buses, mini-buses;
   c) Management and supervisors vehicles;
   d) Food and other logistic deliveries, etc.; and
   e) Subcontractors vehicles.
6. Please explain how *"safe speeds"* are going to be enforced to all vehicles.
7. Please define "*suitable spill response"* procedures and expected minimum and maximum spill reaction times on all the critical segments of the road in case of spill accidents occurring on mines' access roads in summer, winter, day, night conditions for the following scenarios that we have seen occurring on mining roads around the world:
   a) Truck overturns (hazmat on board, driver incapacitated or dead) on road or falls from bridge.
   b) Brakes overheat, fire is started.
   c) Truck hit by hazard and pushed out of road.
   d) Truck falls in a collapsed section of road or bridge (slope, riverbank, karst collapse).
   e) Severe traffic accident involving hazmat, heavy loadings (construction equipment, passenger vehicles).
   f) Same as all the points above in the steep sections of the project.
   g) Barge at Liard Crossing sinks or capsizes.

IR Number: EA1415-01-1-1.1-002
Source: Oboni Riskope Associates Inc.
To: Canadian Zinc Corporation
Subject: Acid spill risks mitigations

Preamble:

The DAR discusses the modified acid transportation mode as follows:
The main change from EA0809-002 is the form of container for sulphuric acid. Previously, 20,000 L tanker deliveries were envisaged. Now, delivery in totes weighing approximately 1.4 tonnes is planned. This represents a significant reduction in the risk of spills because of the much smaller container size, and the fact that totes are quite durable and not easily ruptured. DAR, PR55 page 190. We understand the logic, but in order to follow it more data are needed regarding the totes design and shock/ puncture resilience, as well as how they will be secured on vehicles, and how many per trip.

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Request:

- Please provide what type of totes are going to haul the acid and other hazardous materials and how secure they are (in particular against punctures, falling from truck, in case of truck roll-over) including vehicles and the load securing techniques to be used.

IR Number: EA1415-01-1-1.1-003
Source: Oboni Riskope Associates Inc.
To: Canadian Zinc Corporation
Subject: Concentrate and other fluids hazmat spill consequences and risks.

Preamble:

The DAR discusses the trucking of concentrate and other fluid hazmat as follows:

In winter, the winter environment will limit the risks posed by spills to some degree. This is because spills are usually not able to travel far, are easily contained and can be readily cleaned-up with minimal risk to surface water and groundwater. DAR, PR55 page 192, NB: DAR's Table 9-1 gives the volumes per year, but the text before the table refers to the "operating period"*.* The statement above seems to assume that spills only occur and remain on the road, that there is no accelerated flow due to drainage ditches, and that ruptured totes, tanks, or tankers, etc. will also remain on the road.

The DAR also states that:

Risks to surface water exist, but surface water contamination should be visible and can be cleaned up with downstream interception and collection. There is a risk to groundwater from a large spill if the spill is not completely absorbed by snow or surficial soil, and the underlying bedrock is permeable. The dolomitic rocks of the Nahanni Formation that form the Ram Plateau are potentially permeable, as are granular locations, such as flood-plains. DAR, PR55 page 192. It seems that the statement above may be referring to good visibility, "sunny day" conditions, but "winter, blizzard, and or night" conditions would give a completely different ability to react hence a significantly different risk distribution.

At page 193 the DAR states:

A matrix for the risk of spills, and their consequence, for different sections of the access road is given in Table 9-2. The matrix is based on the Failure Modes and Effects Analysis approach[2] developed by Robertson and Shaw. In the matrix, 'risk' can be considered inter-changeably with 'likelihood'. The assessed magnitude of spill risk

2 http://technology.infomine.com/enviromine/issues/cls_fmea.html

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and consequence by road section is shown in Figure 9-1. We are surprised to see Table 9-1 use inter-changeably the term risk and likelihood. This leads to ambiguity because risk is universally known today to be the combination of likelihood and consequence: the use of a different definition or showing (DAR's Fig. 9-1) a risk (that is actually a likelihood) and consequences separately does not add to the understanding of the risk exposure. From that point on clarity is missing.
We note that in the DAR Addendum Table 7-1 tackles the likelihood of accidents leading to spills (it is unclear, however, how the different types of accidents are combined in order to deliver a "road segment" likelihood). *Table 7-2 summarizes the consequence assessment and is also a modified version of Table 9-2 from the DAR, including those factors considered applicable to the assessment of the consequence of an accident leading to a spill.* Finally, Table 7-3 delivers qualitative estimates of the road segments' risks split in five categories.

In DAR Addendum (PR100) we read:

A fuel spill is considered to be relatively highly reversible in terms of water quality, although moderately reversible for exposed fish which may exhibit longer effects. Reversibility of a concentrate spill is considered to be low for water quality and fish because, although effects should not be particularly significant, they could last for an extended period. Page 57, then Table 7-5 for Water and fish.
We also note that TABLE 7-6: EFFECTS MATRIX, ACCIDENTS LEADING TO SPILLS, ALL TYPES DAR Addendum (PR100) page 60, combines prior information to give a "all types" effect on soil, vegetation, wildlife, water and fish using rather complex reasoning which includes likelihoods and consequences.

Request:

1. Please clarify if the assumption was implicitly made that spills would only occur and remain on the road, the accelerating effect of the road drainage ditches would be nil, and the ruptured totes or tanks, or tankers, etc. would remain on the road after any type of accident.
2. Please clarify which stretches of the road have cross sections where either a truck, a passenger vehicle or its freight could roll away from the road to a distance that presently foreseen emergency cranes cannot reach.
3. Please identify stretches where road platform sudden cracking or severe deformations or collapse are possible due to hydro-geo hazards such as karst (dolines), unstable slope below the road, riverbank erosion and progressive failure, or any other hazardous condition.
4. Please clarify if it was implicitly considered that spill response would occur with good visibility, "sunny day" conditions.
5. Were "winter or blizzard or night" conditions (or any combination thereof) considered in the risk assessment and spill response evaluations?
6. Were the longitudinal slopes and cross sections of the road considered for contaminant dispersion and spill response?

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7. Was the possible presence of karst (dolines) considered for contaminant dispersion and spill response?
8. Please identify occurrences of the word "risk" that, like in Table 9-1, are used inter-changeably with the term risk and likelihood, so that any misleading table, conclusion, recommendation can be clarified in all documents.
9. Please explain how the different types of accidents are combined in order to deliver a "road segment" likelihood.
10. Could you please clarify (maybe using a schematic event tree or a flow chart) how the effects, including reversibility were evaluated?

IR Number: EA1415-01-1-1.1-004
Source: Oboni Riskope Associates Inc.
To: Canadian Zinc Corporation
Subject: Road traffic considerations

Preamble:

The DAR declares that:

Since the all season road follows the general alignment of the permitted winter road, much of the information developed by SNC Lavalin and provided during EA0809-002 is also relevant. DAR page 147.
The proposed road will not have runaway lanes. SNC previously determined that road grades are not steep enough to require them. The Allnorth road design has not increased road grades, and in cases has reduced them. DAR page 147.
There will be no safety railings. Such railings would be ineffective in stopping trucks from leaving the road surface. Also, they are not considered to be necessary given the low vehicle volumes and slow speeds. DAR page 147. In absence of an evaluation of the full expected traffic (including staff, subcontractors, management, etc. as requested in question EA1415-01-1-1.1-001, 5, and given experience gathered on other mining "private" roads with entry checkpoints) it is difficult to evaluate the efficacy of guardrails (or the risks due to their absence) and other possible mitigations.
Guardrails are furthermore useful as visual indicators at night, blizzard and heavy rain conditions and we note that *once built, the winter road will be a public road on territorial land, and access by the general public cannot legally be denied. DAR, PR55 page 146.* Furthermore *there is a concern that non-resident hunters could access the interior via the river using their own boats. DAR, PR55 page 147*

Request:

1. What is the information developed by SNC Lavalin and provided during EA0809-002 which was considered relevant for the DAR, road design and the risk evaluations to date?

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2. What would be the criteria to implement runaway lanes? Do these correspond to a standard or to previous experience on mountainous mining roads with a similar traffic of hazmat?
3. Given that safety railings were ruled-out how is personnel vehicles safety going to be ensured?
4. How is guidance at night, blizzard, heavy rain condition, fog going to be ensured (visual indicators, other)?

IR Number: EA1415-01-1-1.1-005
Source: Oboni Riskope Associates Inc.
To: Canadian Zinc Corporation
Subject: Bridge design criteria

Preamble:

DAR states that:

Design 1 in 100 year return period flow estimates for major crossings are provided in Appendices 3 and 4. Appendix 4 also provides equations for the calculation of 1 in 10 year and 1 in 250 year return period flows. These are estimated to be 70% and 115% of 1 in 100 year flows, respectively. DAR page 79.

Request:

1. Please specify if the air-space between the bridge deck and the flood water level has been foreseen to allow the passing of possible ice-jams, floating debris, water/air hammer effects and scouring.
2. Please specify how bridge abutments and intermediate piles will be protected.

IR Number: EA1415-01-1-1.1-006
Source: Oboni Riskope Associates Inc.
To: Canadian Zinc Corporation
Subject: Liard river barge crossing

Preamble:

The DAR states that:

In summer, a barge would operate on the Liard River crossing for mine traffic. The barge would be private, and so not available for public use. DAR, PR55 page 147.

It is expected the barge will be operational from July to late October (due to Highway 7 load restrictions) and the winter ice bridge will be in place from late November to mid-April. Appendix 1 A pdf page 67 et Table 12: Historical Liard River Crossings data.

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Request:

1. What would be the consequences of a truck/bus falling into the Liard river with different types of contaminants and number of passengers?
2. Is it correct that there will be approx. one month traffic interruption from late October to late November, respectively 2.5-3.5 months mid-April to July?
3. How many days of traffic interruption are foreseen for other meteorological reasons (blizzard, heavy snowfall, heavy rains).
4. How will the traffic interruption above (barge, bridge, road) impact traffic (e.g. possible increase of daily trips, tightening of transport cycles, reserve trucks, etc.?)

IR Number: EA1415-01-1-1.1-007
Source: Oboni Riskope Associates Inc.
To: Canadian Zinc Corporation
Subject: Tolerance/tolerability to risks

Preamble:

As mentioned above, Table 7-3 of the DAR Addendum uses five classes of Qualitative risk levels designated, among others, by a colour-coding.
Colour-coding is as follows: red indicates "very high" risk, orange is "high" risk, yellow is "moderate" risk, green is "low" risk, and blue is "very low" risk (adapted from British Columbia Ministry of Forests, 2002 not in the reference of the document, but cited in the text*). DAR Appendix 2 (PR129) page 69.* Although the colour-coding is used as a prioritization or criticality criteria, there is no explicit reference made to corporate or social risk tolerance/tolerability in the reports.

Request:

1. In which manner was the the colour coding adapted from BC Ministry of Forestry and based on which criteria, and for what reason?
2. Is there a verbiage explaining what each "adjective" (very low to very high) means or can be interpreted (in other words a "scale definition").
3. Is there any way to reconcile the various qualitative likelihood-consequence evaluations with quantitative values (for example: low could mean a certain expected frequency (range), or a certain probability (range)).
4. On which basis are the colours allotted to each one of the cells of the matrix?
5. How are the local level of consequences and regional level of consequences in Appendix 2 accounted for in the final risk evaluation?
6. Where these colours and their meaning discussed with local authorities and regional authorities?
7. Did local authorities have a saying in the colours allotment and scale definitions?

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IR Number: EA1415-01-1-1.1-008
Source: Oboni Riskope Associates Inc.
To: Canadian Zinc Corporation

Subject: Risk and Crisis Management Commitments

Preamble:

In the DAR we read that Commitments are made to:

Carry out at least monthly visual inspections for areas designated high-risk due to potential slope stability or ground stability issues until seasonal baselines for behaviour are established, and then carry out regular visual inspections thereafter, including at least one inspection prior to spring freshet to confirm that culverts are free-draining, then monthly during the thaw season, and at least once during the winter for areas with hazards that exist in winter (e.g. for rock fall that is freeze/thaw-related). Estimates of the expected duration before seasonal baselines are established, how visual inspections of "remotely located" (with respect to the road alignment) slopes is intended to be performed are apparently missing.

Carry out inspections for high-risk areas within 24 hours of major rainfall events, abnormally high spring thaw events or significant seismic events, and/or prior to mine traffic travelling the road. DAR, page 34. The Commitments do not seem to state what these inspections would involve, who would perform them.

Request:

1. Could the Commitments be clarified in terms of the inspection protocol, the professional qualifications of the inspectors?
2. Given the daily nature of mine traffic do the Commitments indicate that a daily inspection will be performed or they indicate that there will be an inspection after any mine traffic interruption?