G3 – Reclamation and Closure Plan

List of Comments/Questions/Topics Which Need Further Clarifications
Questions Compiled by R. Halim – April 28, 2004
Responses Compiled by CanZinco Ltd. – May 15, 2004

ID	Description	Reference	Comments/Questions	Response
01	Community Summary	p. vi item 4	"Covered with over 4 feet (1.25m) of shale **plus** a gravel cap" P. iv of the Executive summary states 1m shale +0.25m sand and gravel.	Thank you for identifying this inadvertent typo. error. The correct dimensions are 1m shale plus 0.25 m sand & gravel.
02	Community Summary	p. vii 3rd para.	Should add a paragraph indicating that the monitoring plan is "open ended". Environmental performance monitoring will continue until sufficient data has been collected to confirm that long term behaviour of the site will meet the reclamation objective (see Main Report, Section 9.1.2, p. 121	Agreed.
03	Executive Summary	p. viii 5th and 6th paragraphs	Confirm that reclamations of GN-owned facitilies and the dock area are the responsibility of the GN and the Federal Government, respectively.	Reclamation of the GN-owned facilities and the dock are the responsibility of the GN and the Federal Government, respectively.
04	Executive Summary	p. x , last paragraph	Clarify that the comprehensive performance review will be carried out in 2007, in 2010 or both.	The terms of Reference for the Comprehensive Review are required in 2007, per Part G, Item 22 of the Water License. The Comprehensive Review would then be carried out according to the Terms of Reference as they are approved by the Water Board. This may involve data review and may include additional field studies. CanZinco is proposing that the Comprehensive Review will be finalized

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				and reported on, inclusive of the work described in the Terms of Reference, by 2010 such that appropriate actions can be implemented at the end of CanZinco's proposed monitoring period.
05	Main Report	General	A Reference section of the Main Report is required. Suggest a list of References, as they are described in the various chapters of the report.	The Reclamation and Closure Plan document (Report G3) brings forward and summarizes the conclusions of the appended reports and rolls those into the overall reclamation plan. In cases where readers desire to review the detailed calculations or rationales that are summarized in Report G3, the specific appendices should be read. We recognized that we would be unable to anticipate all of the locations where readers might desire specific references to the detailed reports and, therefore, provided the executive summaries for each report and more general references by topic area so that readers would be able to find the appropriate report to read in greater detail.
06	Main Report – Completion of Technical Studies	p. 11 Section 2.4.8	Reports of the technical studies were NOT completed in December 2003. The last report was received in March 2004.	Thank you for identifying this inadvertent typo. error. The correct date is March 2004.

07	Main Report - Mining	p. 33 , Section 4.3	No detailed information on reclamation activities is provided for some of the openings. How to cover the portal, block access, quantities of materials , etc.	Section 7.9.4 describes the approach to closure of the underground openings and commits to adhering to the requirements of the Mines Act. As was discussed at the Yellowknife Technical Meeting and subsequently documented in CanZinco's response to Information Requests (May 14, 2004), an engineering design report for closure of underground openings will be prepared and filed with the NWB by the end of November 2004. Since closure of these mine openings is not scheduled until late in the reclamation activities, this timeframe should allow sufficient time for approval of the designs prior to the scheduled implementation in 2005.
08	Main report – Tailings stabilization study	p. 42 – item 5, top page	How this be taken into account for the final cover activities? Any surveys indicating areas that are already covered with shale? Other report states 0.3m thick.	The shale placed on the Surface Cell during mine operations for dust suppression or other interim remediation reasons is not included into the reclamation cover. That is, the reclamation cover that has yet to be placed following surface grading of the tailings will be the full (minimum) 1.25 m thickness in all areas of the Surface Cell.
09	Main Report – Closure Cover Materials –	p. 44 Section	Reference to Golder report. No reporting date/year.	The report date is February 1, 1999. The report reference no. is

	Geotechnical Evaluation	5.10		982-2432.5200.
10	Main Report - Talik	Section 6.5.2, p. 59 3rd paragraph	Test cell dike elevations – 383.5 and 385.5m	The Test Cell Dike was constructed in two stages. The first stage raised the dike crest to a nominal elevation of 383.5 m in 2000. The second and final stage raised the dike crest to a nominal elevation of 385.5 m in 2001.
11	Main Report – Borrow Areas	Section 6.6.2, p. 66, last paragraph	Will shale cover be required to block/close mine openings other than the west and east adit portals? Have these openings been closed and seals? See ID 07 above	Many of these openings have been closed. An engineering design report for closure of underground openings is scheduled to be filed by the end of November 2004, as described above and in CanZinoc's response to Information Requests dated May 14, 2004. If these designs require shale fill, then the volumes are anticipated to be minor, relative to the primary uses of shale. As stated in Section 6.6.2, a substantially greater volume of shale has been identified than is required and, therefore, production of a relatively minor quantity for closure of underground openings, if necessary, is not anticipated to pose a risk to the reclamation plan.
12	Main Report – Borrow Areas	Section 6.6.2, p. 68, 5th paragraph	Extraction rate of 2436 m3/day is incorrect	This value of 2436 m^3 is an error. The value should be 3789 m^3/day (2436 m^3/day from Mt. Fuji, plus 1353 m^3/d from WT Quarry).
13	Main Report – Rock Piles	Section 6.8.2,	See report G8 – Quantities do not add up to 178,000 m3.	See responses provided to questions regarding Report G8, Rock Piles and

		p. 75, 1st paragraph		Open Pits Closure Plan.
14.	Main Report – Reclamation and Closure Monitoring	Section 6.9.2, p. 82, 2nd paragraph	Justification for the objective to capture **at least 95%** of soil containing contaminants in excess of the SQROs.	CanZinco is committed to recovering as much contaminated soil as possible and the goal will be 100% effectiveness. However, experience (including Gartner Lee's current experience at the Polaris site) has demonstrated that 100% effectiveness is not achievable and realistic in all circumstances and, therefore, the minimum criteria of 95% effectiveness has been provided. You will also have noted that the design requirement for minimum 95% effectiveness is coupled with a second criteria, that no residual materials will exceed twice the SQRO (Section 9.4). This combination of criteria ensures that the remedial plan is achievable while providing for protection of the environment, as is currently being implemented by Gartner Lee for remediation of soils at the Polaris mine site.
15	Main Report – Reclamation and Closure Monitoring	Section 6.9.2, p. 83, 3rd paragraph	Clarify between the 2007 and 2010 comprehensive assessment review.	The terms of Reference for the Comprehensive Review are required in 2007, per Part G, Item 22 of the Water Licence. The Comprehensive Review would then be carried out according to the Terms of Reference as they are approved by the Water Board.

				This may involve data review and may include additional field studies. CanZinco is proposing that the Comprehensive Review will be finalized and reported on, inclusive of the work described in the Terms of Reference, by 2010 such that appropriate actions can be implemented at the end of CanZinco's proposed monitoring period.
16	Main Report - WTDA	Section 6.12.2, p. 104 , 3rd paragraph	Test cell dike elevations – el . 383.5 and 385.5m	The Test Cell Dike was constructed in two stages. The first stage raised the dike crest to a nominal elevation of 383.5 m in 2000. The second and final stage raised the dike crest to a nominal elevations of 385.5 m in 2001.
17	Main Report – West adit area – a typo error	p. 136 Section 7.3.2, 2nd paragraph	"increase confidence in this assessment (item no. 5 above)". Should it be "item 3"?	Thank you for identifying this inadvertent typo. error. The correct reference is to "(item no. 3 above)".
18	Main Report – West adit area	p. 136	ARD assessment. Justify the use of BC criteria instead of DIAND's Guidelines for ARD prediction in the North (1992). DIAND criteria appears to be used in Rock Piles and Open Pits closure Plan (G8) – See Section 3.2.2 of this report.	The field of ARD assessment and predictive testing is a dynamic field that has undergone and continues to undergo development and refinement on a year-by-year and project-by-project basis. We feel that any technical investigation, including acid rock drainage predictive testing, should be based on the most current, state-of-the-art information. British Columbia has been a leading

				jurisdiction in ARD prediction in recent years and has generated some recent state-of-the-art information on predictive testing and interpretation for ARD assessment that is more current than the 1992 work by Morrin and Hutt. Nonetheless, the 1992 work was specific to the North and contains some extremely useful information that will be brought forward, as appropriate.
19	Main Report – Borrow area	p. 141 Section 7.4	The list of proposed quarries to be utilized are more than the four major quarries (plus Twin Lake S&G) specified in the Quarry report – G6. Please confirm. No development plan on some of the other quarries in G6 report.	Agreed, there are currently no development plans for some of the minor quarries (i.e. landfill quarry, Area 14 quarry) that may be used during reclamation activities. A field program is planned for the summer of 2004 to collect more information for these quarries so that a development and reclamation plan may be developed if they are required.
20	Main report – Underground openings	p. 148 Section 7.9.4	No details (sketches or drawing) on how to backfill and seal the raises/ventilation openings.	Section 7.9.4 describes the approach to closure of the underground openings and commits to adhering to the requirements of the Mines Act. As was discussed at the Yellowknife Technical Meeting and subsequently documented in CanZinco's response to Information Requests (May 14, 2004), an engineering design report for closure of underground openings will be prepared and filed with the NWB by

				the end of November 2004. Since closure of these mine openings is not scheduled until late in the reclamation activities, this timeframe should allow sufficient time for approval of the designs prior to the scheduled implementation in 2005.
22	Main Report – Proposed Reclamation Activities	Section 7.3 to 7.9	General Questions. 1. In these sections, references were made on quantities for reclamation based on ESA investigations. Could not locate if there is a summary table in the ESA report or other reports that summarize such quantities. Quantities in Waste Disposal Plan (G16) or Rock piles and open pits (G8) do not agree 100%. 2. A comprehensive timeline chart that summarizes all reclamation activities will be useful. It will show how the reclamation work progresses among different sites/locations and different activities.	Following from discussions at the Yellowknife Technical Meeting, CanZinco's response to Information Requests (May 14, 2004) included an amended table that provides a complete listing of the estimated source volumes of contaminated soil and demolition debris with the available storage volume in the designated disposal locations. Following from discussions at the Yellowknife Technical Meeting, CanZinco's response to Information Requests (May 14, 2004) included a commitment to provide a reclamation implementation schedule for the Public Hearing.
23	Main Report – Contaminated soil volumes	p. 150, Section 7.11	Contamination for metals only – 32,950 m3. Appendix M, p. 2 states 33,400 m3	Following from discussions at the Yellowknife Technical Meeting, CanZinco's response to Information Requests (May 14, 2004) included an

				amended table that provides a complete listing of the estimated source volumes of contaminated soil and demolition debris with the available storage volume in the designated disposal locations.
24	Main Report – Closure and Reclamation Monitoring	p. 157 Section 9.1.3, last paragraph	Comprehensive assessment report in 2010. What about review for 2007?	The terms of Reference for the Comprehensive Review are required in 2007, per Part G, Item 22 of the Water Licence. The Comprehensive Review would then be carried out according to the Terms of Reference as they are approved by the Water Board. This may involve data review and may include additional field studies. CanZinco is proposing that the Comprehensive Review will be finalized and reported on, inclusive of the work described in the Terms of Reference, by 2010 such that appropriate actions can be implemented at the end of CanZinco's proposed monitoring period.
25	Main Report – Water Quality – Closure period Years 3 to 5	Table 10	Notes for Table Need to add A – annually	Agreed.
26	Main Report – Geothermal monitoring	Sections 9.3.2 and 9.3.3 Tables 11 and 12	Table 11 – new instruments are included in Table 11. Confirm that none of these are yet installed as of April 2004?	Yes, your understanding is correct.

			Closure period – reduced VW piezometers (both no. of instrument and frequency) are shown for monitoring during this period. Would observation to ensure that excess pore pressure within the taliks be critical during the closure period, as it will take up to 30 years to freeze the tailings? Concern of reducing monitoring frequency and number of vw piezometers from 13 VW piezometers during the reclamation period to 9 during the closure period, and from monthly to quarterly. Any possibilities to get the VW piezometers automated, so that they can be read remotely?	Yes, monitoring of pore pressure trends within the taliks as they freeze back is an important goal of the monitoring program. The proposed reduction in the monitoring program for the closure period assumes that field monitoring will confirm the modeling used to predict behaviour of the talik. If the freeze-back occurs as expected, this will indicate that the remediation method is showing signs of success (i.e. moving in the right direction) and there would be a tempered reduction in monitoring requirements as things become more stable. However, as with all aspects of the monitoring plan, in the event that this is not the case, then the monitoring program will be maintained as-is or modified to focus on areas of specific concern. It is our view that the costs and operational uncertainties introduced into the project by installing sophisticated remote monitoring instrumentation in an Arctic environment are not warranted at this time but may be explored later once monitoring operations are finalized. If concerns arise during the monitoring periods that could be resolved by remote monitoring, then this would be

			A plan which shows locations of all instrumentation (old and proposed) will be helpful.	considered. This plan exists for the WTDA as Figure 3 in the Reclamation and Closure Monitoring Plan (Report G9). The proposed locations of new, future instrumentation for other areas is described in the relevant reports.
27	Main Report – 2008 Comprehensive Performance Review	p. 170 Section 9.7	Is this supposed to refer to the 2008 Comprehensive performance **Review** or the **Studies**? Would the review be completed in 2007? How does this relate to the 2010 review?	The terms of Reference for the Comprehensive Review are required in 2007, per Part G, Item 22 of the Water Licence. The Comprehensive Review would then be carried out according to the Terms of Reference as they are approved by the Water Board. This may involve data review and may include additional field studies. CanZinco is proposing that the Comprehensive Review will be finalized and reported on, inclusive of the work described in the Terms of Reference, by 2010 such that appropriate actions can be implemented at the end of CanZinco's proposed monitoring period.
28	Appendix M	p. 2	Does the quantities shown in the table match with the quantities described in the various tables in G-16 report?	Following from discussions at the Yellowknife Technical Meeting, CanZinco's response to Information Requests (May 14, 2004) included an

				amended table that provides a complete listing of the estimated source volumes of contaminated soil and demolition debris with the available storage volume in the designated disposal locations.
29	Appendix M	p. 3	Clarify the first assumption that the minimum depth to which soils can be effectively excavated at Nanisivik is 0.3m. Does this mean that if the soil is contaminated below 0.3m, it will not be included in the volume calculations, and will not be reclaimed?	The equipment used for excavation of soils largely determines the minimum effective depth of excavation. For most typical heavy equipment utilized at a mine site, CAT 235 or larger hydraulic excavators and D6 and larger bulldozers, it is difficult to effectively and accurately excavate soils to less than about 0.3 m depth without excess time being expended that can delay the project. Where contamination at Nanisivik is indicated to a depth of less than 0.3 m, the volume estimates assume that soil will be excavated to 0.3 m regardless. Where contamination is indicated to a depth greater than 0.3 m, the volume estimates are based on complete excavation to the total depth of contamination.