Executive Summary

Nanisivik Mine, CanZinco Ltd has made application to the Nunavut Water Board for the renewal the current Industrial Water License, NWB1NAN9702, issued July 30th 1997. The renewal application is for Industrial Operation of a specified volume of domestic quality water in the amount of 180,000 cubic meters from a surface source known locally as the East Twin Lake.

The Nanisivik Mine began operation in October 1976 as the world's most northerly metal mine and became the first permanent industrial project in the Canadian Arctic.

Located on Baffin Island's Strathcona Sound, exploration by Texasgulf Inc., from 1957 to 1970 had outlined the ore deposit. In 1974 Nanisivik Mines Ltd., was formed with, Mineral Resources International, the Government of Canada. Metallgesellschaft and Billiton being shareholders and Strathcona Mineral Services Ltd., providing project management. In 1996 Breakwater Resources Limited purchased the mine from Alberta Energy Corporation Limited, which had recently acquired the assets of then owners Conwest Exploration Ltd.

The Nanisivik Mine is located at approximately 73 degrees 10 minutes north latitude and 84 degrees 30 minutes west longitude on Baffin Island, approximately 750 kilometers north of Iqaluit, in the Nunavut Territory. The town-site of Nanisivik is located approximately 1 kilometer south of the Industrial Site while the East Twin Lake is located approximately 5 kilometers southeast of the Industrial Site. The nearest Inuit community is the village of Arctic Bay, a community of approximately 750 people, which lies west of the Nanisivik Mine property and is accessible by a 32 kilometer unpaved road. The Nanisivik and Arctic Bay communities are serviced by jet aircraft from Ottawa, Ontario via Iqaluit and Resolute as well as by smaller aircraft such as Twin Otter and Hawker Siddley 748's from Pond Inlet, Resolute as well as Iqaluit.

The Nanisivik Mine has been in operation since 1976 and currently operates at an average mining rate of 875,000 tonnes per year and a maximum projected rate of 1.1 million tonnes/year. Nanisivik Mine is primarily a zinc-lead operation and the rationale for this license renewal proposal is to continue to enhance the value of the current mine by exploiting the available resources on the property. Typical principle production consists of zinc and lead concentrates grading 57.4% zinc and 45% lead respectively from the existing Nanisivik property. Metal recovery of Zinc in concentrate is approximately 96% while Lead metal is lower at approximately 25% in saleable concentrates. The low lead recovery is typically impacted by normally low feed grades at less than 0.2% Pb in the ore. The mill operates at approximately 790,000 mt/yr and produces approximately 105,000 tonnes of Zinc Concentrates and 1,200 tonne of Lead Concentrates. Markets for these products are via Antwerp, Belgium, private smelters and ultimately the London Metal Exchange. Transportation of all materials shipped is via ocean going vessels between the months of July – September.

Nanisivik Mine is planning to employ Dense Media Separation technology to remove lightweight gangue rock, especially dolomite, from the sulphide to improve the recovery of economic minerals and maximize resource exploitation. The sulphides will be added to the process stream of the Mineral Processing Plant (mill) while the waste will be screened and disposed of underground as backfill. It is has been shown from bench testing, that sulphide recovery will be in the order of 98%, which will report to the mill. The remaining waste, dolomite, will be screened for water removal and will be used as backfill underground.

It is intended that the current existing tailings disposal area, which has been in use for approximately 25 years, will continue to be used for the disposal of mill tailings under the renewed license. This area was chosen as there was enough storage volume for the projected tailings generation and there was no evidence of fish contained within it during the baseline study of 1974. The employment of containment structures (earthen dykes) began in the early 90's once the available submarine storage volume was consumed. By raising the containment dyke 2 meters annually it has allowed the continuous operation and storage of tailings on-land without disruption to the day-to-day mining activities. These containment structures will continue to be used at the Nanisivik Mine to deposit flotation tailings from the mill in order to allow for the continued maximization of the non-renewable metal resource on the Nanisivik property.

Maximizing the use of the resources in the area shall be a financial benefit to the mine operators, employees, and the local economy. The apparent and immediate benefit to the Baffin region is a corporate effort to provide employment to the native community where possible. The benefit to the Nunavut Territory is through the large tax base provided by industry through income and payroll taxes as well as permitting and land-use fees paid by the operator to carryout mining and other activities. The benefit to Canada and Canadians is to help advance the welfare and social well being of all persons within the country including Native groups within the north by providing employment, tax revenue for social and education programs and an active economy.

The Water Licence Application Supplementary Questionnaire for Mine Development details the ongoing operational activities at Nanisivik Mine and also highlights environmental management, monitoring, submissions and reporting requirements as required under the current license. Additional information with regards to original environmental baseline data is also included for further background review.

ᓇᐃᒃᓕᒥᐊᕐᓯᒪᔪᑦ ᐅᖃᐅᓯᖅᓴᐃᑦ

ᓇᓂᓯᕕᒃᑯᑦ, ᑲᓐᓯᓐᑯ ᒪᐃᓐ ᑯᓐᓂᑦ ᐱᕐᑯᑎᒋᔭᐅᔪᑦ ᐱᔪᒪᔪᑎᖃᕐᓯᒪᒃᒪᑕ ᓄᓇᕗᒻᒥ ᐃᒥᓕᕆᔨᒃᑯᓄᑦ ᓄᑖᖑᕐᑎᕐᑎᕆᐊᕈᒪᓗᑎᒃ ᓚᐃᓯᓯᒥᔭᖕᖓᓂᒃ, ᓇᓴᐅᑎᓕᒃ NWBINAN9702, ᑐᓂᔭᐅᓚᐅᕐᑐᖅ ᔪᓚᐃ 30 1997-ᒥ. ᓄᑖᖑᕐᑎᕐᑎᕆᐊᕈᑕᐅᔪᖅ ᐃᖃᓇᐃᔭᕐᕕᒃᒧᑦ ᐊᑐᕐᑕᐅᒐᔭᕐᑐᑦ ᐃᒥᕐ ᐊᖏᓂᖅᑐᖅ 180,000 ᑭᐸᓇᒃᓯᓗᒍ ᐊᑕᐅᓯᖅ ᒥᑕ. ᓄᓇᐅᑦ ᖃᖓᓂᕐᑐᒥᒃ ᑕᐃᔭᐅᔪᒥᒃ ᒪᕈᓕᓯᒪᔪᑦ ᐱᖃᑕ ᑕᓯᓕᐊᕆᓯᒪᔪᖅ.

ᓇᓂᓯᕕᒃᑯᑦ ᐊᐅᓚᔭᒥᐊᓚᐅᕐᓯᒪᔪᑦ ᐅᑐᐱᕆ 1976-ᒥ ᓄᓇᕐᔪᐊᕐᒥᓗ ᐅᕝᐅᑦᑕᑐᒥᓚᖑᓂᕐᑕᐅᓗᓂ ᐅᔭᕋᓂᐊᕐᕕᖕᒥᒃ ᐊᒻᒪᓗ ᓯᓄᓕᕐᐸᖑᓗᓂ ᑲᓇᑕᐅᑦ ᐅᑭᐅᕐᑕᖑᓂ ᐃᖃᓇᐃᔭᕐᕕᖕᒥᒃ ᐱᒋᐊᕐᑎᕐᑎᔪᓂ.

ᐃᓂᒋᔭᖓ ᕿᑭᕐᑕᓗᒃᒥᑐᖅ ᐊᓐᓂᑐᑦ ᑲᖏᕐᓗᐊᓂᑐᖅ. ᕿᓂᖅᑕᓕᓚᐅᑐᑦ ᐅᔭᕋᖕᓂᒃ ᐊᑎᖅᑐᑦ ᑎᒃᓯᒃᑲ 1957-ᒥᑦ 1970-ᒧᑦ ᓇᓂᓯᓚᐅᕐᓯᒪᔪᑦ ᑕᓱᒥᖓ ᐅᔭᕋᓂᐊᕐᓂᐅᔪᒥᒃ. 1974-ᒥ ᓇᓂᓯᕕᒃ ᐅᔭᕋᓂᐊᕐᕕᒃ ᓴᕿᑎᑕᐅᓚᐅᕐᑐᖅ ᐅᑯᓇᖓ, ᒥᓄ ᐅᓕᓯᐊᕐ, ᒐᕙᒪᒃᑯᑦ ᑲᓇᑕᒥ, ᒥᑕᐱᓯᔅᓯ ᐊᒪ ᐱᓕᑦ ᑎᒍᒥᐊᕐᑎᐅᓗᑎᒃ ᐊᒻᒪᓗ ᓯᑐᓚᑯᓇ ᒥᓂᓗᑯᑦ ᐃᖃᓇᐃᔭᕐᑎᕐᕈᑎᖃᕐᓗᑎᒃ. 1996-ᒥ ᐸᓚᐃᒃ ᑯᐊᑐ ᐅᓕᓯᐊᓯᓐ ᓂᐅᕕᓚᐅᕐᓯᒪᔪᑦ ᐅᔭᕋᓂᐊᕐᕕᖕᒥᒃ ᐅᐸᖓᑦ ᐊᓐᐸᑕ ᐃᓄᔾ ᑯᐊᐳᓇᓴᓐᑯᓂᑦ ᑖᒃᑯᐊᓗ ᓂᐅᕕᕐᑐᕕᓂᐅᓗᑎᒃ ᑲᓐ ᑯᐃᒃ ᐃᓪᐳᓗᓕᐊᓴᖅ.

ᓇᓂᓯᕕᒃ ᐅᔭᕋᓂᐊᕐᕕᖓ ᐃᓂᖃᕐᑐᖅ ᓄᓇᖑᐊᑎᒍᑦ ᓇᓴᐅᑎᖃᕐᑐᖅ 73° 10' ᐊᒻᒪ 84° 30' ᕿᑭᕐᑕᓗᒃᒥ, ᐅᖓᓯᒃᓂᖃᕐᑐᖅ 750 ᑭᓚᒥᑕᒥᑦ ᐃᖃᓗᒃᓂᑦ, ᓄᓇᕗᑦᒥ, ᓄᓇᓕᖓ ᓇᓂᓯᕕᐅᑦ ᐅᖓᓯᒃᓂᖃᕐᑐᖅ 1 ᑭᓚᒥᑕᒥᑦ ᐅᔭᕋᓂᐊᕐᕕᐅᔪᒥᑦ, ᐊᒻᒪ ᑕᓯᓕᐊᕆᓯᒪᔪ ᐅᖓᓯᒃᓂᖃᕐᑐᑦ 5 ᑭᓚᒥᑕᒥᒃ. ᖃᓂᓚᖑᔪᕐ ᐃᓄᐃᑦ ᓄᓇᓕᖓᑦ ᐃᒃᐱᐊᕐᔪᒃ, ᐃᓅᒋᐊᕐᓂᖃᕐᑐᖅ 750-ᓂᒃ ᐊᒻᒪ ᐅᐸᒃᓴᐅᓗᓂ 32 ᑭᓚᒥᑕᒥᒃ ᑕᑭᓂᓕᒃᑯᑦ ᐊᖅᑯᑎᒃᑯᑦ. ᓇᓂᓯᕕᒃᒥᐅᑦ ᐊᒻᒪ ᐃᒃᐱᐊᕐᔪᒃᒥᐅᑦ ᑎᑭᑦᑕᕐᕕᐅᔪᑦ ᖃᖓᑦᑕᕐᔪᐊᒥᒃ ᓱᐳᒥᒃ, ᐊᐅᓪᓚᒥᑦ, ᐃᖃᓗᒃᓄᑦ, ᐊᐅᓯᐃᑐᒥᑦ, ᐊᒻᒪ ᖃᖓᑕᓱᕐᑕᖑᓂᖅᓴᐃᑦ ᒪᕈᓕᕐᓚᑦ ᑎᑭᑦᑕᕐᓇᓗᑎᒃ ᒥᑦᑎᒪᑕᓕᒃᒥᑦ ᐊᐅᓯᐃᑦᑐᒥᑦ ᐊᒻᒪ ᐃᖃᓗᒃᓂᑦ.

ᓇᓂᓯᕕᒃᑯᑦ ᐊᐅᓚᓂᖅᓯᒪᓕᕐᑐᑦ 1976-ᒥᑦ ᐱᒋᐊᕐᓗᓂ ᐊᒻᒪ ᒫᓐᓇᐅᔪᖅ ᐅᔭᕋᒃᑕᖅᑕᕐᑐᑦ 875,000-ᒥᒃ ᐅᖁᕐᒋᓕᒃᒥᒃ ᐊᕐᒍᑕᒪᑦ ᐊᒻᒪ ᐊᖏᓚᖑᔪᕐ ᐃᓱᒪᒋᔭᐅᓯᒪᔪᖅ 1.1 ᒥᓕᐊᓐ ᐅᖁᕐᒋᓕᒃᒥᒃ ᐊᕐᒍᒧᑦ. ᓇᓂᓯᕕᒃᑯᑦ ᐅᐸᕐᕿᑕᖅᑕᕐᓂᖅᓴᐅᔪᑦ ᔾᓐ ᐊᒻᒪ ᓕᑦ ᓴᐱᕐᔭᒃᓴᓂᒃ ᑕᓇ ᓄᑖᖑᕐᑎᑕᐅᓇᓱᒍᑎᒋᔭᖓ ᐃᒥᕐᒧᑦ ᐊᑐᖅᑕᕈᒪᓂᖓ ᐃᑲᔪᕐᑕᐅᓇᓱᒃᑐᖅ ᐊᑯᓕᐅᓂᖅᓴᒥᒃ ᐅᔭᕋᓂᐊᕐᕕᐅᔪᖅᓇᖅᓚᖓᑦ ᓴᐱᕐᔭᖅᓴᒥᒃ ᐊᖏᓂᖅᓴᒥᒃ ᐱᖃᑦᑕᕐᓂᖅᓴᐅᒍᑎᒃ. ᒫᓐᓇᐅᔪᖅ ᐅᔭᕋᖅᓴᐃᑦ ᓴᓗᒪᖅᓴᕐᑕᐅᒐᖕᒥᒃ ᐊᖏᓂᖃᖃᑦᑕᕐᑐᑦ 57.4 ᐳᓴᓐ ᔾᓐ ᐊᒻᒪ 45ᐳᓴᓐ ᓕᑦ. ᓴᐱᕐᔭᖅᓴᐃᑦ ᐱᖃᑦᑕᕐᑕᖏᑦ ᓴᓗᒪᖅᓴᕐᑕᐅᓯᒪᓕᕐᓗᒍ 96-ᐳᓴᓐᖓ ᔾᓐ ᐱᔭᐅᖃᑦᑕᕐᑐᖅ ᐊᒻᒪ 25-ᐳᓴᓐ ᓕᑦ ᓂᐅᕈᑕᐅᔪᓐᓇᕐᑐᓂᒃ. ᓕᑦ ᒥᑭᓂᖅᓴᐅᔪᑎᒋᔭᖓ ᒥᑭᓐᓂᖅᓴᐅᔪᑦ ᓕᑦ ᐱᔭᕐᑕᐅᖃᑦᑕᕐᓂᖓᓄᑦ. ᓴᓗᒪᖅᓴᕐᑕᐅᓂᖏᑦ ᐅᔭᕋᖕᓂᒃ 790,000-ᒥᒃ ᐅᖁᕐᒋᓕᒃᒥᒃ ᐊᕐᒍᑕᒪ ᓴᓗᒪᖅᓴᐃᖃᑦᑕᕐᑐᑦ ᐊᒻᒪ 105,000 ᐅᖁᕐᒋᓕᒃᒥᒃ ᔾᓐ ᐱᔭᐅᖃᑦᑕᕐᑐ ᐊᒻᒪ 1,200 ᐅᖁᕐᒋᓕᒃᒥᒃ ᓕᑦ. ᓂᐅᕕᕐᑕᐅᖃᑦᑕᕐᓂᖏᑦ ᐊᕐᑯᑎᒃᑯᑦ ᐊᓐᑐᕌᑉ, ᐱᐅᔨᐊᑉ, ᐊᐅᓪᓚᐅᔨᑦ ᓴᐱᕐᔭᕐᓂᒃ ᐊᒻᒪ ᑎᑭᐅᑎᓗᓂ ᓚᓐᑕᓐᒥ ᓴᐱᕐᔭᕐᒥᒃ ᓂᐅᕕᕐᑎᐅᔪᓄᑦ. ᐅᓯᔭᐅᖃᑦᑕᕐᑐᖅ ᓴᐱᕐᔭᖅ ᐅᒥᐊᕐᔪᐊᒃᑯᑦ ᑕᖅᑭᖓᓂ ᔪᓚᐃᒥᑦ - ᓯᑎᐱᕆᒧᑦ.

ᓇᓂᓯᕕᒃᑯᑦ ᐸᕐᓇᒃᑐᑦ ᐱᒋᐊᕐᑎᑦᑎᔪᒪᓗᑎᒃ ᐅᕿᖏᓂᖓᒍᑦ ᐊᐱᒃᑐᑦᑕᐅᓂᖏᑦ: ᓴᐱᕐᔪᒃᓴᐃᑦ ᓴᓗᒪᖕᓴᕐᑕᐅᓂᖏᓐᓂᒃ, ᐱᔭᕐᑕᐅᓗᑎᒃ ᐅᕿᓂᕐᓴᐃᑦ ᐅᔭᕋᐃᑦ, ᐱᓗᐊᕐᑐᒥᒃ ᓗᖁᐊᖑᓂᕐᑕᐅᔪᑦ, ᐱᔭᕐᑕᐅᓂᕐᓴᐅᓂᐊᕐᒪᑦ ᓂᐅᕈᑕᐅᔪᓐᓇᑐᑦ ᓴᐱᕐᔪᒃᓴᐃᑦ ᐱᔭᕐᑕᐅᓂᕐᓴᐅᓇᓯᒃᑐᑎᒃ. ᓴᓗᒪᖕᓴᐅᑎᑦ ᐃᓚᔭᐅᕙᑦᑕᕐᔪᑦ ᐃᒃᓗᐊᓗᒃᒥ ᐊᒻᒪᓗ ᐊᑐᕆᐊᖏᑐᑦ ᐅᐸᐃᑦ ᐅᑎᕐᑎᑕᐅᕙᑦᑕᓗᑎᒃ ᓄᓇᐅᑦ ᐊᑕᓄᑦ. ᖃᐅᔨᓴᕐᑕᐅᓂᑯᔪᑦ ᓇᓗᓇᐃᕐᓯᓚᐅᕐᒪᑕ ᐃᓚᖕᓇᔭᐅᕙᑦᑐᖅ ᐅᑎᕐᑎᑕᐅᒐᔭᕐᓂᖓᓂᒃ 98-ᐳᓴᖕᖓᓂᒃ. ᐊᒥᐊᒃᑯᔪᑦ ᐅᐸᕋᐃᑦ ᖃᐅᔨᓴᕐᑕᐅᕋᑦᑕᕐᓂᐊᕐᑐᑦ ᓴᐱᕐᔪᒃᓴᕋᕐᒪᖓᑕ ᓴᐱᕐᔪᒃᓴᕋᖏᓂᖏᑦ ᐅᑎᕐᑎᑕᐅᕙᑦᑕᓗᑎᒃ ᓄᓇᐅᑦ ᐊᑕᓄᑦ.

ᐸᕐᓇᒃᑭᓗᑎᒃᓗ ᑯᐱᕐᑕᕐᕕᐅᔪᖅ ᐊᑐᕐᑕᐅᖏᓇᕐᓯᒪᔪᕐ ᐊᕐᒍᓄᑦ 25-ᓄᑦ, ᐊᑐᕐᑕᐅᖏᓇᕈᒪᓕᕐᓗᓂ. ᑕᓇ ᑯᐱᕐᑕᕐᕕᐅᖏᓇᕈᒪᓗᓂ ᐊᖏᓂᖓ ᓇᒪᒃᓂᖓᓄᑦ ᑯᐱᕐᑕᕐᕕᐅᒃᑲᓂᕈᓐᓇᕐᒪᑦ. ᐊᒻᒪᓗ ᖃᐅᔨᓴᕐᑕᐅᓗᓂ ᐃᖃᓗᖃᖏᓂᕐᑕᐅᓚᐅᕐᓯᒪᒻᒪᑦ 1974-ᒥ. ᐊᕙᓗᔭᐅᕙᓕᐊᓕᓚᐅᕐᓯᒪᔪᖅ ᑐᐊᕙᒃᒥᒃ 1990-ᕈᔪᒃᒥ ᐃᒪᕆᔭ ᓄᖑᑕᐅᓚᐅᕐᑎᓗᒍ. ᐳᕐᑐᓯᒋᐊᕐᓂᖓ 2-ᒥᑕᒥᒃ ᑐᐊᕙ ᑯᐱᕐᑕᕐᕕᒃᑲᓂᕈᓇᕐᓯᓗᓂ ᐅᔭᕋᓂᐊᕐᓂᕐᒧᑦ ᑭᖑᕙᐅᑎᓯᒪᖏᓗᓂ. ᑕᖕᓇ ᐊᕙᓗᓯᒪᔪᖅ ᑐᐊᕝ ᑯᐱᕐᑕᕐᕕᐅᔪᖅ ᐊᑐᕐᑕᐅᖏᓐᓇᕐᓂᐊᕐᑐᖅ ᓴᓗᒪᖕᓴᐅᑎᕕᓂᑦ ᑯᕕᔭᐅᕙᑦᑕᕐᓂᐊᕐᑐᖅ.

ᐊᑐᕈᓐᓇᕐᑕᓕᒫᖓᓄᑦ ᐊᑐᕐᑕᐅᓇᓱᒃᓂᐊᕐᑐᖅ ᐃᒥᖓ ᑭᓇᐅᔭᑎᒍᓐᓗ ᐱᕙᓕᐅᑎᕙᓇᕐᓂᐊᕐᒥᒃᒪᑦ ᐅᔭᕋᓂᐊᕐᑐᓄᑦ, ᐃᖃᓇᐃᔭᕐᑐᓄᑦ, ᐊᒻᒪᓗ ᓄᓇᓕᒃᓂ ᑭᓇᐅᔭᖕᓴᕐᑐᓄᑦ. ᐱᓕᕆᐅᑎᓂᖓᓕ ᐅᔭᕋᓂᐊᕐᕕᐅᓂᖓᓄᑦ ᓄᓇᓕᒃᓂ ᐃᖃᓇᐃᔭᕐᑎᑦᑎᕙᑦᑕᕐᓂᖓᓄᑦ ᐊᕙᕐᓇᖓ ᒃᑲᖓᑦ. ᐱᕙᓕᐅᑎᓯᒪᒃᒥᔪᕐ ᓄᓇᕗᑦᒧᑦ ᑕᑯᔭᕐᓂᖏᑎᒍᑦ ᐃᖃᓇᐃᔭᕐᑎᓄᑦ, ᐊᒻᒪᓗ ᐸᐃᕙᓄᑦ ᐊᖏᕐᑕᐅᔪᑎᓄᑦ ᐊᑭᓕᖅᑲᑦᑕᕐᓂᖏᓐᓄᑦᓗ. ᑲᓇᑕᒧᑦ ᐱᕙᓕᐊᑎᓯᒪᔪᖅ ᐃᑲᔪᕐᑕᐅᒥᓗᓂᓗ ᐃᖃᓇᐃᔭᕐᑎᑦᑎᓗᑎᒃ ᐃᓄᓯᖅᑲᑎᐊᕐᐸᓕᕐᑎᑦᑎᓗᑎᒃᓗ.

ᐃᒥᕐᒧᑦ ᓚᐃᓯᓯᑕᕈᒪᓂᖓ ᑎᑎᕋᕐᓯᒪᓂᖅᑯᒥᔪᖅ ᖃᓄᐃᓕᐅᕐᓂᓇᒐᔭᕐᑕᖏᖕᓂᒃ ᓇᓂᓯᕕᒃᑯᑦ ᐊᒻᒪᓗ ᐊᕙᑎᕐᑎᓄᑦ ᓯᕈᖕᓴᐃᑕᐃᓕᒪᔪᑕᐅᔪᑦ ᑎᑎᕋᕐᓯᒪᒋᓐᓗᑎᒃ. ᐊᒪᕐᑐᑦ ᑐᑭᓯᒥᐸᕈᑎᒃᓴᒃᓐᓂᑦ ᐊᕙᑎᓕᓇᓂᕐᒧᑦ ᑎᑎᕋᕐᑕᐅᓯᒪᒋᓐᓗᑎᒃ ᐱᔪᒪᔪᑎᒥᒃᑲᓯᐅᑎᓐᓗᑎᒃ.