



Snap Lake Environmental Monitoring Agency
Main Floor, Lahm Ridge Tower
4501 Franklin Avenue
P.O. Box 95, Yellowknife, NT X1A 2N1
Phone: 867-765-0961 FAX: 867-765-0963
Website: www.slema.ca

Simon Toogood
Environmental Assessment Officer
Mackenzie Valley Environmental Impact Review Board
200 Scotia Centre
Box 938, 5102-50th Ave
Yellowknife, NT X1A 2N7

Marc Casas
Regulatory Officer
Mackenzie Valley Land and Water Board
7th Floor – 4910 50th Avenue
P.O.Box 2130
Yellowknife, NT X1A 2P6

File: EA1314-02
Water Licence MV2011L2-0004

April 22, 2014

Re: Information Request on TDS Removal

Dear Mr. Toogood and Mr. Casas,

During the Technical Sessions from April 15 to 16, 2014, De Beers presented options to reducing Total Dissolved Solids (TDS) in effluent, and stated that treatment of full mine effluent was not cost-effective.

Snap Lake Environmental Monitoring Agency (SLEMA) investigated the impacts of TDS level in mine water and TDS removal efficiency of mitigations such as reverse osmosis on the ratio of mine water which must be treated to meet the proposed Effluent Quality Criterion (EQC) for TDS. SLEMA would like to request De Beers review the equation and results provided below and confirm whether they are justifiable.

$$R > 100(C - \text{EQC}) / (\eta C)$$

Where,

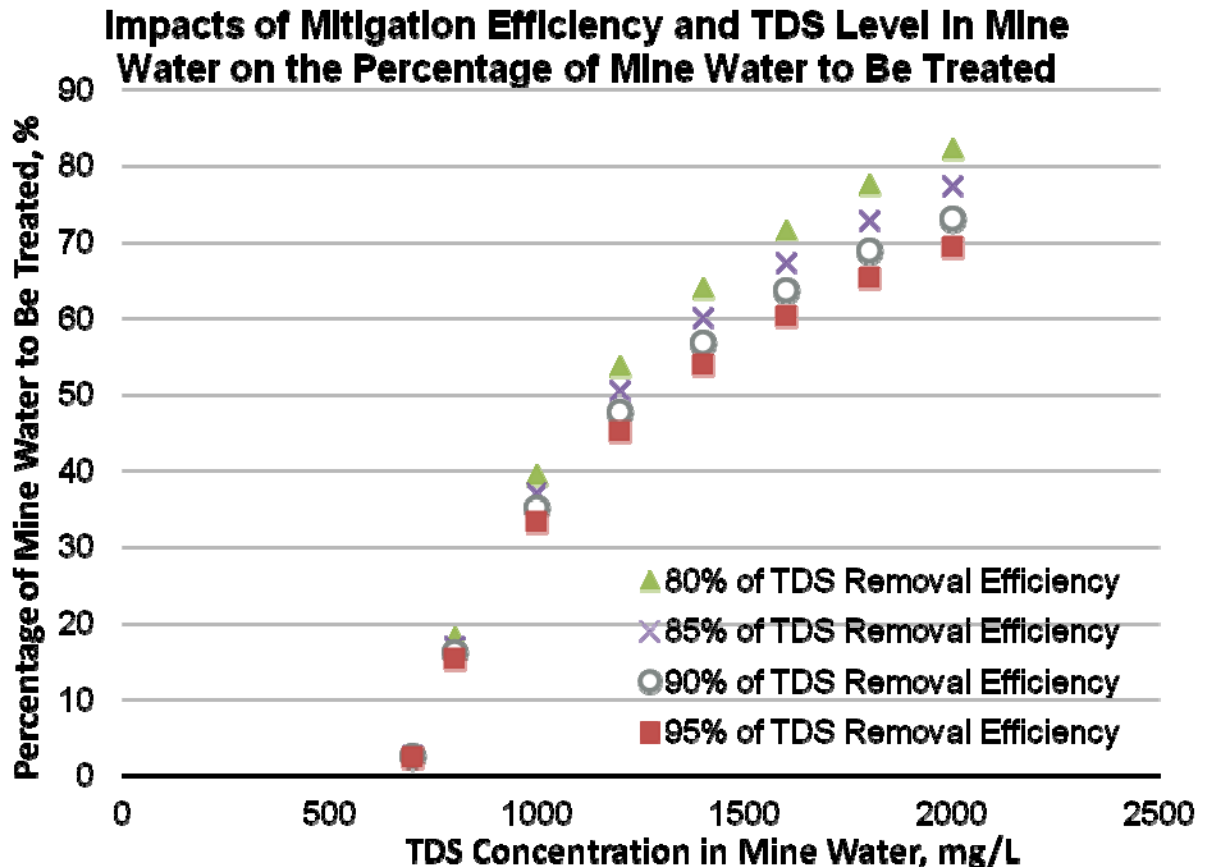
- R – Ratio of mine water to be treated, %
- C – TDS concentration in mine water, mg/L
- EQC - Effluent Quality Criterion for TDS, mg/L
- η – TDS removal efficiency, %



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If EQC for TDS is 684 mg/L, the percentage of mine water to be treated is calculated and illustrated as below.

TDS Removal Efficiency, %	TDS Concentration in Mine Water, mg/L							
	700	800	1000	1200	1400	1600	1800	2000
80	2.9	18.1	39.5	53.8	63.9	71.6	77.5	82.3
85	2.7	17.1	37.2	50.6	60.2	67.4	72.9	77.4
90	2.5	16.1	35.1	47.8	56.8	63.6	68.9	73.1
95	2.4	15.3	33.3	45.3	53.8	60.3	65.3	69.3



It is clear that the more TDS removal efficiency could be achieved, the less mine water has to be treated; the more TDS is in mine water, the more mine water has to be treated.



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If you have any questions whatsoever, please feel free to contact Philippe di Pizzo at 867-765-0961 / exec@slema.ca.

Sincerely,

Philippe di Pizzo

A handwritten signature in black ink, appearing to read 'P. di Pizzo', on a light blue background.

Executive Director