

April 18, 2016

**Via Hand Delivery and Electronic-mail:** [Jennifer.Winsor@gov.mb.ca](mailto:Jennifer.Winsor@gov.mb.ca)

Ms. Jennifer Winsor  
Environmental Approvals Branch  
Conservation and Water Stewardship  
123 Main Street, Suite 160  
Winnipeg, Manitoba R3C 1A5

**Re: Notice of Minor Proposed Alteration  
Early Discharge from East Tailings Pond and Tailings Pond Re-Processing  
Bissett Gold Mine - Environment Act Licence 2628RR  
Klondex Canada Ltd.**

Dear Ms. Winsor:

Klondex Canada Ltd. (Klondex) is submitting this Notice of Alteration (NOA) to the Environmental Approvals Branch (Branch) of the Manitoba Conservation and Water Stewardship to request permission for early discharge from the East Tailings Pond (ETP) and to re-process economic portions of the existing Tailings Pond. Based on discussions with the Branch on Monday April 11, 2016, Klondex has prepared this NOA outlining the proposed alterations to the Environmental Act Licence 2628RR (EA Licence), which are:

1. Early Discharge from the ETP; and
2. Tailings Pond Re-Processing.

All compliance activities related to the EA Licence will continue to be executed accordingly. All required notices to Manitoba Conservation, Environment Canada, and Hollow Water First Nations will be made prior to, during, and post discharge. Klondex has included the required processing fee in the amount of \$500 cheque (Cheque No. 000057), payable to the Minister of Finance.

## **Background Information**

### *Current Status of Rice Lake Mine and the Tailings Management Area*

The Rice Lake Mine was placed into care and maintenance on April 14, 2015 by San Gold Corporation. Klondex purchased the Rice Lake Mine on December 17, 2015 and is currently working to re-open mining facilities. Under San Gold Corporation, milling operations ceased on April 16, 2015 and since that time no tailings were deposited in the Tailings Pond. The new ETP

construction was completed in November 2014, and was approved for water storage by the Branch on December 17, 2014.

The EA Licence currently allows effluent to be discharged from the Tailings Management Area (TMA) during an annual discharge in the summer and fall. Effluent is pumped from the Polishing Pond to No Name Creek (unofficial name) through the discharge pipeline and to the final discharge point known as End of Pipe (EOP). No Name Creek is an intermittently dry tributary which flows downstream into the Wanipigow River. Several stream monitoring stations are located along the discharge path as well as on background monitoring location in the Wanipigow River. The EA License also provides permission for a 2,500-ton per day mining, milling, and refining operation in Mineral Lease 63, Township 24, Range 13 and 14. As required by Section 14 of *The Environment Act*, this NOA outlines the proposed minor alterations and includes a summary of the insignificant potential environmental effects.

## **Early Discharge from the East Tailings Pond**

### *Proposed Discharge Activities*

Klondex is proposing to discharge from the ETP to the No Name Creek discharge point through the existing discharge pipeline. The discharge will commence May 9, 2016 which is 36 days prior to the licenced discharge date of June 15. Klondex anticipates that discharge activities will take up to four weeks to complete and will likely continue into the approved EA Licence discharge period. The ETP currently contains approximately 780,000 cubic meters (m<sup>3</sup>) of water which is likely to increase to 900,000 m<sup>3</sup> from spring rainfall and runoff. Infrastructure needed for early discharge activities were previously approved by the Branch on June 23, 2015. The expected rate of discharge will not exceed the permitted rate of 0.2 cubic meters per second.

### *Reasons for Early Discharge*

The proposed early discharge from the ETP is needed to allow Klondex to begin re-processing economic portions of the existing Tailings Pond and to re-establish the water balance in the TMA prior to commencing operations at the Rice Lake Mine. Under the currently approved EA Licence, effluent can be discharged annually between June 15 and November 30 from the Polishing Pond. Klondex is proposing to begin discharging from the ETP to permitted EOP on May 9, 2016 in addition to the permitted annual discharge. The early discharge will have the following long term benefits at the mine:

1. Allows reprocessing activities to begin with re-processed tailings material deposited into the ETP;
2. Allows Klondex to re-establish the water balance prior to commencing mining operations;
3. Discharge water from the ETP prior to the first-time addition of tailings;
4. Reduces the risk of freeboard issues in 2017 and onwards; and

5. Reduces the risk that Klondex will need to request permission for emergency effluent discharges.

#### *Water Quality and Water Volume*

The majority of the water in the ETP is meteoric water, which has collected since November 24, 2015. Klondex estimates that the ETP contains 780,000m<sup>3</sup> of water which meets all water quality requirements as outlined by the EA Licence. Approximately 200,000m<sup>3</sup> of water in the ETP is from the Polishing Pond which was transferred in January 2016. The bi-monthly sampling of the ETP commenced in February 2016 after water had been transferred, as required by the EA Licence. The bi-monthly surface water sample taken on February 18, 2016 indicates that the water in the ETP meets discharge quality requirements based on the *Metal Mining Effluent Regulation* (MMER) limits for effluent discharged from metal mines. Klondex also sampled the ETP on April 13, 2016 and the results will be submitted under separate cover. In addition to the water quality being well below the MMER limits, it is also below most of the limits set by the *Manitoba Water Quality Standards, Objectives and Guidelines Regulation* (MWQSOG) for the protection of freshwater aquatic life and is included in Attachment 1.

#### **Tailings Re-Processing Project**

##### *Current Status of Existing Tailings Pond and Milling Circuit*

The current mineral processing flowsheet is a conventional gold recovery circuit. Ore is crushed through two-stage crushing followed by ball mill grinding and gravity separation. The gravity concentrate is sent to the refinery and incorporated in the doré bars. Material from the grinding circuit is sent to the floatation circuit. The floatation concentrate is reground and sent to cyanide leach. From cyanide leach precious metal is refined into doré bars.

All tailings material is placed in the Tailings Pond. Figures 1 and 2 show the existing Tailings Pond. The area of the existing Tailings Pond that Klondex believes can be economically re-processed is identified in the box on Figure 1. Figure 2 was taken in April 2016 and shows the current condition of the tailings material; the material is solid and stable.

**Figure 1: Rice Lake Mine Existing Tailing Pond**



**Figure 2: Recent Photograph of the Existing Tailings Pond Taken April 2016**



### *Summary of the Re-Processing Project*

Prior to placing the Bissett Gold Mine into care and maintenance, San Gold Corporation had determined that a portion of the tailings deposited was economically viable and not all the gold was recovered. The 2014 sampling program determined that the gold content of the tailings included sufficient grade to warrant the re-processing project. This tailings material is already crushed and milled and will therefore bypass the crushing and grinding stages of the milling process. Tailings material will be pumped directly into the flotation circuit and from there will follow the existing gold recovery flowsheet. If the 2016 tailings re-processing is successful, Klondex may consider continued tailings re-processing in future years.

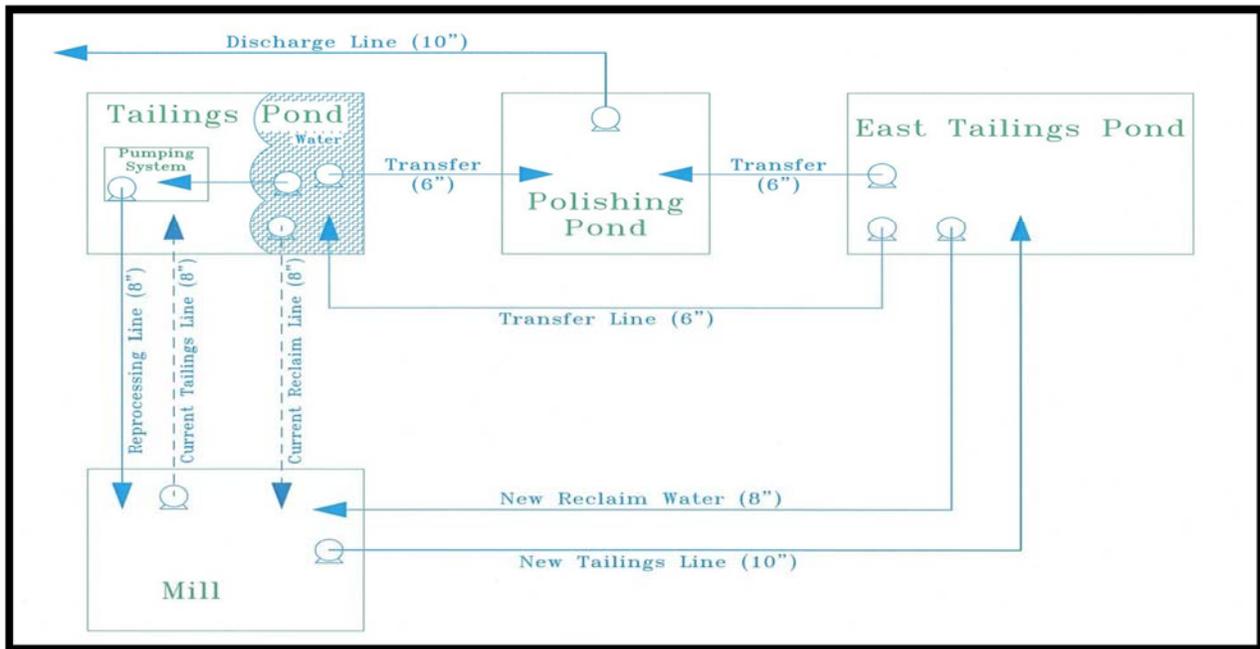
Klondex is proposing to begin the tailings re-processing project on June 1, 2016 with tailings being reprocessed through the Mill and deposited in the East Tailings Pond. Klondex is only proposing to operate the project during the summer and fall months.

### *Requested Changes*

The project includes the construction and operation of a dredging system, pumping station, booster pumps and pipeline to turn dry tailings at the Tailings Pond into slurry and pump back to the mill for reprocessing using the current milling equipment. The reprocessed material will then be pumped to the ETP for final deposition, as allowed by the EA Licence. Klondex estimates that between 80,000 m<sup>3</sup> and 150,000 m<sup>3</sup> will be removed from the current Tailings Pond in the 2016 re-processing project. The re-slurried tailings will be pumped through an existing piping system with minor extensions and relocations, as shown in Attachment 2. Detailed pumping and processing drawings are included in Attachment 3. No new processing aid or milling techniques will be needed.

The dredging system will be installed within the Tailings Pond on a pontoon structure. The pontoon will be winched across the tailings by an operator dredging the tailings material. The dredged material will be pumped to a new 12,000-gallon tank located on the staging platform within the Tailings Pond. Material from the tank will be pumped to the mill using the existing 10-inch pipeline. All pumps and equipment located at the Tailings Pond will be powered by diesel generators, located within the Tailings Pond on the staging platform. Klondex will provide as-built drawings, under separate cover, once re-processing construction activities are complete. As required by the EA Licence, the engineered drawings will be submitted within 30 days.

**Figure 3: Proposed Flow Diagram**



### Potential Environmental Effects

#### *Early Discharge from the East Tailings Pond*

As required by sub-clause 22(d) of the EA Licence, no effluent will be released that will result in direct or cumulative downstream degradation of water quality immediately beyond a maximum 10% mixing zone within No Name Creek and/or Wanipigow River. No changes to environmental effects are anticipated with the early discharge as the water quality exceeds the standards required by the EA Licence. This water quality is consistent with previous discharge water and outlined in the *Findings of the Annual Effluent and Water Quality Monitoring Report* (Parks Environmental Inc., January 21, 2016) for the previous discharge conducted from the ETP in October and November of 2015. This NOA request is for discharging 36 days prior to the permitted time from the ETP. To ensure that there are no effects from the early discharge and the protection of aquatic flora and fauna, Klondex will increase the frequency of effluent monitoring activities to twice a week.

#### *Tailings Re-Processing Project*

The only changes requested for the Tailings Re-Processing Project is new pumping and piping. Klondex believes that the potential for environmental effect are minor as all pumping will be contained within the Tailings Pond or have secondary containment. No milling modifications or alterations are required for the re-processing. The re-processed tailings will be deposited in the ETP which is an approved activity under the EA Licence.

Ms. Jennifer Winsor

April 18, 2016

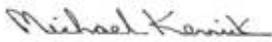
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If you have any concerns or require further information please don't hesitate to contact me at (204) 277-5411.

Sincerely,

**Klondex Canada Ltd.**



Mike Kernick  
General Manager, Bissett Gold Mine

MK: ljh

Attachments: Cheque No. 000057  
Attachment 1 February 18, 2016 Sampling Results for East Tailings Pond  
Attachment 2 Tailings and Discharge Pipeline  
Attachment 3 Tailings Pumping Schematic

cc. Amelia Bauer, Environmental Superintendent, Klondex Canada Ltd.  
Lucy Hill, Environmental Manager, Klondex Mines Ltd.  
Mike Doolin, Chief Operation Officer, Klondex Mines Ltd.  
Neil Rentz, Enforcement Branch, Manitoba Conservation

**Attachment 1**  
East Tailings Pond Water Quality

Parameter	Units	Sample February 18, 2016	MMER Max Monthly Mean Concentration	MWQSOG Chronic	MWQSOG Acute
pH	pH units	7.72	<6.0/>9.5	<6.5/>9.0	
Conductivity	umhos/cm	1550			
Total Suspended Solids	mg/L	10.0	15.00		
Turbidity	NTU	2.80			
Cyanide, Total	mg/L	<0.0020	1.00		
Cyanide, Weak Acid Diss	mg/L	<0.0020			
Cyanide, Free	mg/L	<0.0050		0.0052	0.022
Bicarbonate (HCO <sub>3</sub> )	mg/L	328			
Carbonate (CO <sub>3</sub> )	mg/L	<0.60			
Hydroxide (OH)	mg/L	<0.34			
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	269			
Ammonia, Total (as N)	mg/L	3.72		8.75 <sup>#</sup>	3.5 <sup>#</sup>
Chloride (Cl)	mg/L	130			
Fluoride (F)	mg/L	<0.10			
Hardness (as CaCO <sub>3</sub> )	mg/L	326			
Nitrate (as N)	mg/L	13.3		13	
Nitrate and Nitrite as N	mg/L	13.4		10	
Nitrite (as N)	mg/L	0.102		0.06	
Phosphorus (P)-Total	mg/L	0.156			
Sulfate (SO <sub>4</sub> )	mg/L	241			
TDS (Calculated)	mg/L	940			
Total Kjeldahl Nitrogen	mg/L	4.6			
<b>Dissolved Metals</b>					
Aluminum (Al)-Dissolved	mg/L	0.0095			
Antimony (Sb)-Dissolved	mg/L	0.00052			
Arsenic (As)-Dissolved	mg/L	0.00181		0.15	0.34
Barium (Ba)-Dissolved	mg/L	0.0602			
Beryllium (Be)-Dissolved	mg/L	<0.00020			
Bismuth (Bi)-Dissolved	mg/L	<0.00020			
Boron (B)-Dissolved	mg/L	0.125			
Cadmium (Cd)-Dissolved	mg/L	0.000016		0.00056*	0.0063*
Calcium (Ca)-Dissolved	mg/L	75.1			
Cesium (Cs)-Dissolved	mg/L	0.00022			
Chromium (Cr)-Dissolved	mg/L	<0.0010		0.195*	1.5*
Cobalt (Co)-Dissolved	mg/L	0.00270			
Copper (Cu)-Dissolved	mg/L	0.0613		0.025*	0.041*
Iron (Fe)-Dissolved	mg/L	0.042			
Lead (Pb)-Dissolved	mg/L	<0.000090	0.20	0.0089*	0.227*
Lithium (Li)-Dissolved	mg/L	0.0022			
Magnesium (Mg)-Dissolved	mg/L	37.6			
Manganese (Mn)-Dissolved	mg/L	1.23			
Molybdenum (Mo)-Dissolved	mg/L	0.0353			
Nickel (Ni)-Dissolved	mg/L	0.0086		0.141*	1.272*

Parameter	Units	Sample February 18, 2016	MMER Max Monthly Mean Concentration	MWQSOG Chronic	MWQSOG Acute
Phosphorus (P)-Dissolved	mg/L	0.108			
Potassium (K)-Dissolved	mg/L	44.1			
Rubidium (Rb)-Dissolved	mg/L	0.0207			
Selenium (Se)-Dissolved	mg/L	<0.0010			
Silicon (Si)-Dissolved	mg/L	5.03			
Silver (Ag)-Dissolved	mg/L	<0.00010			
Sodium (Na)-Dissolved	mg/L	194			
Strontium (Sr)-Dissolved	mg/L	0.653			
Tellurium (Te)-Dissolved	mg/L	<0.00020			
Thallium (Tl)-Dissolved	mg/L	<0.00010			
Thorium (Th)-Dissolved	mg/L	<0.00010			
Tin (Sn)-Dissolved	mg/L	<0.00020			
Titanium (Ti)-Dissolved	mg/L	<0.00050			
Tungsten (W)-Dissolved	mg/L	0.00095			
Uranium (U)-Dissolved	mg/L	0.00025			
Vanadium (V)-Dissolved	mg/L	<0.00020			
Zinc (Zn)-Dissolved	mg/L	0.0039		0.323*	0.319*
Zirconium (Zr)-Dissolved	mg/L	<0.00040			
Sulfur (S)-Dissolved	mg/L	88.1			
<b>Total Metals</b>					
Aluminum (Al)-Total	mg/L	0.0149		0.100^	
Antimony (Sb)-Total	mg/L	0.00054			
Arsenic (As)-Total	mg/L	0.00171	0.50		
Barium (Ba)-Total	mg/L	0.0570			
Beryllium (Be)-Total	mg/L	<0.00020			
Bismuth (Bi)-Total	mg/L	<0.00020			
Boron (B)-Total	mg/L	0.139		1.5	29.0
Cadmium (Cd)-Total	mg/L	0.000015			
Calcium (Ca)-Total	mg/L	76.0			
Cesium (Cs)-Total	mg/L	0.00020			
Chromium (Cr)-Total	mg/L	<0.0010			
Cobalt (Co)-Total	mg/L	0.00261			
Copper (Cu)-Total	mg/L	0.0727	0.30		
Iron (Fe)-Total	mg/L	0.092		0.300	
Lead (Pb)-Total	mg/L	<0.000090			
Lithium (Li)-Total	mg/L	0.0034			
Magnesium (Mg)-Total	mg/L	33.0			
Manganese (Mn)-Total	mg/L	1.18			
Molybdenum (Mo)-Total	mg/L	0.0372		0.073	
Nickel (Ni)-Total	mg/L	0.0081	0.50		
Phosphorus (P)-Total	mg/L	0.14			
Potassium (K)-Total	mg/L	39.5			
Rubidium (Rb)-Total	mg/L	0.0203			
Selenium (Se)-Total	mg/L	<0.0010		0.001	
Silicon (Si)-Total	mg/L	5.50			
Silver (Ag)-Total	mg/L	<0.00010		0.0001	

<b>Parameter</b>	<b>Units</b>	<b>Sample February 18, 2016</b>	<b>MMER Max Monthly Mean Concentration</b>	<b>MWQSOG Chronic</b>	<b>MWQSOG Acute</b>
Sodium (Na)-Total	mg/L	200			
Strontium (Sr)-Total	mg/L	0.678			
Tellurium (Te)-Total	mg/L	<0.00020			
Thallium (Tl)-Total	mg/L	<0.00010		0.0008	
Thorium (Th)-Total	mg/L	<0.00010			
Tin (Sn)-Total	mg/L	<0.00020			
Titanium (Ti)-Total	mg/L	0.00055			
Tungsten (W)-Total	mg/L	0.00103			
Uranium (U)-Total	mg/L	0.00026		0.015	0.033
Vanadium (V)-Total	mg/L	<0.00020			
Zinc (Zn)-Total	mg/L	0.0030	0.50		
Zirconium (Zr)-Total	mg/L	<0.00040			
Sulfur (S)-Total	mg/L	96.4			

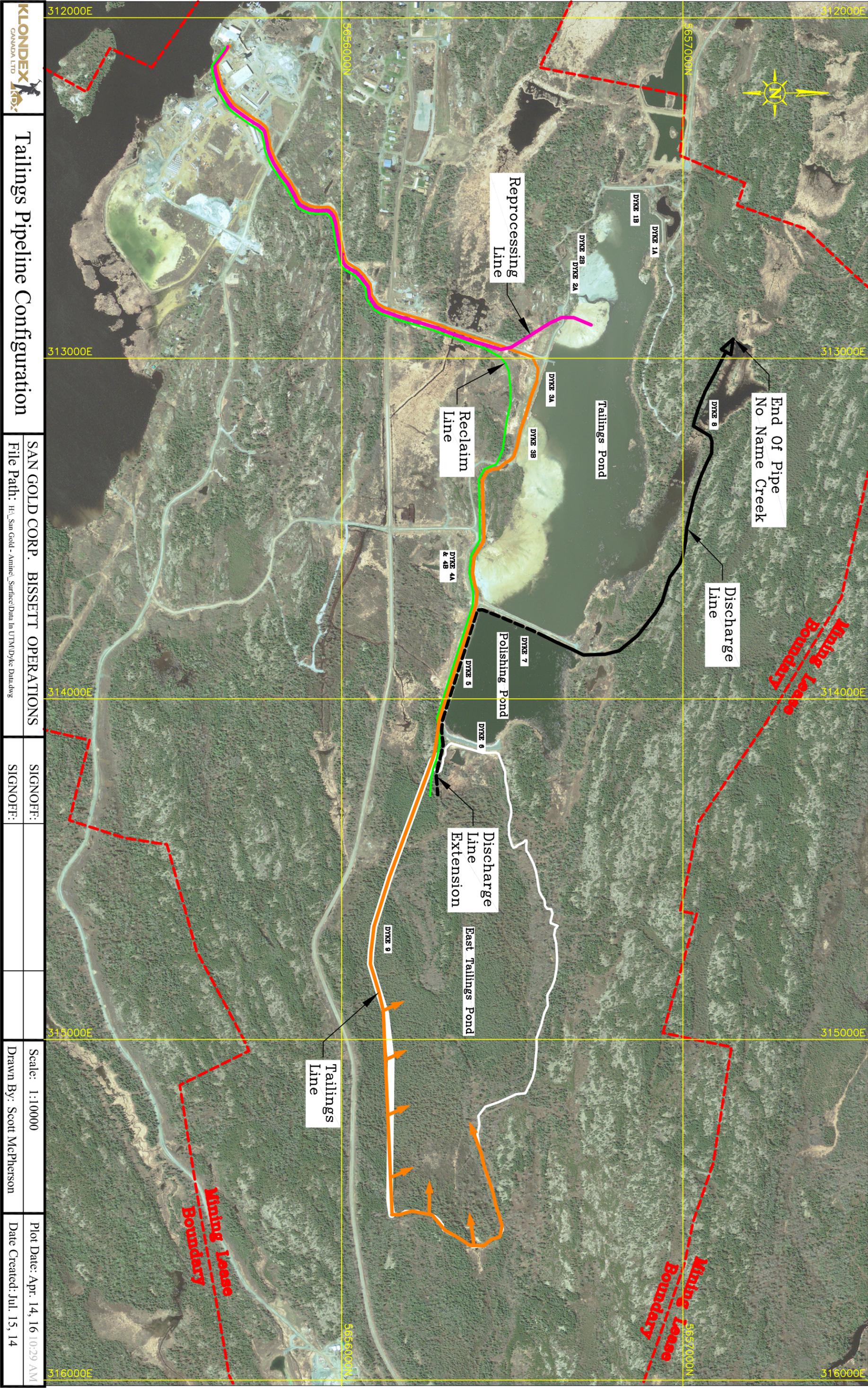
# pH and temperature dependent

^ pH dependent

\* Hardness dependent

*Italicized Values* exceed MWQSOG standard

**Attachment 2**  
Discharge and Tailings Pipeline Routing



# Tailings Pipeline Configuration

SAN GOLD CORP. BISSETT OPERATIONS  
 File Path: H:\San Gold - Admin\SurfaceData in UTM\Dyke Data.dwg

SIGNOFF:  
 SIGNOFF:

Scale: 1:10000  
 Drawn By: Scott McPherson

Plot Date: Apr. 14, 16 10:29 AM  
 Date Created: Jul. 15, 14

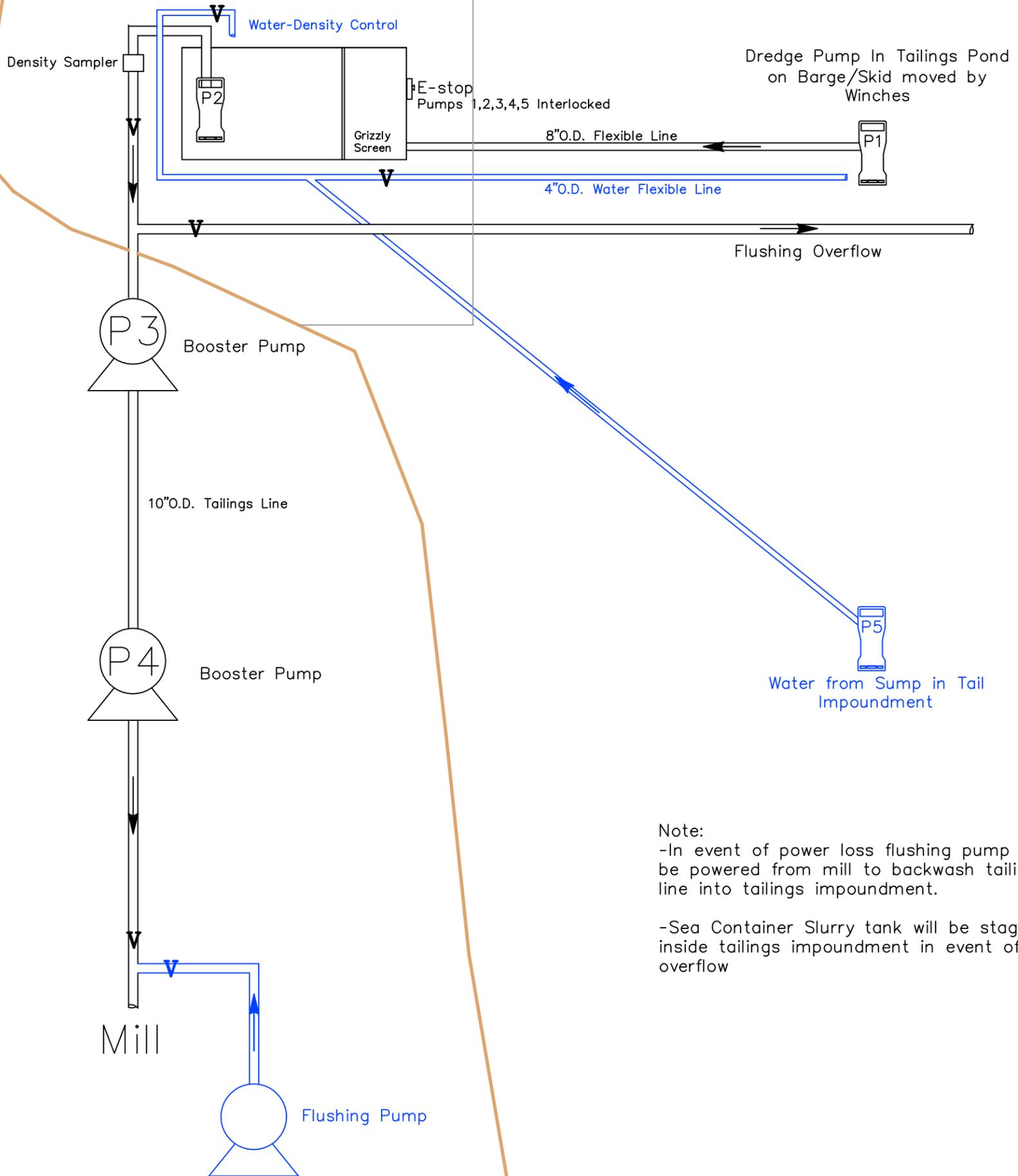
**Attachment 3**  
Tailings Pumping Schematic

## Edge of Tailings

350KW Genset      Back up Genset  
Supplies Power to P1, P2, P3, P4 P5

Staging Pad  
(contained within Dyke)

20' Sea Container Slurry Tank 12,000 Gal Capacity  
Slurry 35% Solid by weight



### Note:

-In event of power loss flushing pump will be powered from mill to backwash tailings line into tailings impoundment.

-Sea Container Slurry tank will be staged inside tailings impoundment in event of overflow