BEEBYN-W11 PROJECT

WORKS APPROVAL APPLICATION

ATTACHMENT 6A

EMISSIONS AND DISCHARGES

Revision: A

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TABLES

1.0 WASTE DISCHARGES

1.1 Mine Dewatering

Dewatering discharge will be pumped to a lined water storage dam with a capacity of 25,000 m^3 for reuse as dust suppression around the mine site, and within the crushing and screening works. A portion of this water will be treated by reverse osmosis (RO) to produce potable water and diverted to the administration facilities for domestic use. A water monitoring program will be conducted to confirm the ongoing quality of the potable water. Brine waste from the RO treatment will be returned to the water storage dam.

Laboratory analysis demonstrates that the groundwater is fresh to slightly brackish. Table 1.1 provides a summary of the results of analysis of samples obtained from bores constructed for water abstraction. Livestock drinking water trigger values have been included as a comparison for water quality.

Table 1.1: Laboratory analysis of water samples from the project area.

Analyte	Unit	B_LTM_03	B_LTM_04	B_WB2_01	B_WB2_02	Livestock drinking water trigger value
Date Sampled		15/7/2019	16/7/2019	17/7/2009	18/7/2019	
Acidity	pH	7.8	7.6	8.6	7.6	
Electrical Conductivity @ 25°C	µS/cm	1200	1400	2300	1600	
Total Dissolved Solids @180°C	mg/L	690	830	1400	950	4000
Total Hardness as $CaCO_3$	mg/L	250	330	500	310	
Carbonate, CO_3	mg/L	<1	<1	14	<1	
Bicarbonate, HCO_3	mg/L	290	370	380	370	
Chloride, Cl	mg/L	180	220	450	260	
Sulphate, SO_4	mg/L	88	130	190	160	1000
Nitrate, NO_3	mg/L	55	28	<0.2	14	
Sodium, Na	mg/L	170	180	190	230	
Potassium, K	mg/L	11	14	180	12	
Calcium, Ca	mg/L	37	45	50	39	1000
Magnesium, Mg	mg/L	38	54	92	52	Not toxic
Soluble Iron, Fe	mg/L	<0.02	<0.02	<0.02	<0.02	
Fluoride, F	mg/L	0.4	0.3	0.5	0.3	
Free Cyanide	mg/L	<0.01	<0.01	<0.01	<0.01	
Aluminium, Al	mg/L	<0.02	<0.02	<0.02	<0.02	0.04
Arsenic, As	mg/L	0.005	<0.002	0.24	<0.002	
Manganese, Mn	mg/L	0.007	0.007	0.074	0.29	Not toxic
Lead, Pb	mg/L	<0.005	<0.005	<0.005	<0.005	
Cadmium, Cd	mg/L	<0.001	<0.001	<0.001	<0.001	
Copper, Cu	mg/L	<0.005	<0.005	<0.005	<0.005	
Antimony, Sb	mg/L	<0.0005	<0.0005	0.05	<0.05	
Mercury, Hg	mg/L	<0.05	<0.05			
Silver, Ag	mg/L	<0.005	<0.005	<0.005	<0.005	
Boron, B	mg/L	1	0.9	0.7	1.2	
Barium, Ba	mg/L	<0.005	<0.005	0.02	<0.01	

Analyte	Unit	B_LTM_03	B_LTM_04	B_WB2_01	B_WB2_02	Livestock drinking water trigger value
Beryllium, Be,	mg/L	<0.005	<0.005	<0.005	<0.005	
Cobalt, Co	mg/L	<0.01	<0.01	<0.01	<0.01	
Chromium, Cr	mg/L	<0.005	<0.005	<0.005	<0.005	
Molybdenum, Mo	mg/L	<0.01	<0.01	<0.01	<0.01	
Nickel, Ni	mg/L	0.007	0.005	0.06	0.008	

Due to the low salinity of the groundwater, no adverse impact to vegetation is expected to occur as a result of direct contact with the water (i.e. spills or overspray). There is some potential for accumulation of salt in areas where water is regularly applied for dust suppression, such as the roads, ROM and laydown areas. Surface water runoff from these areas may have elevated salinity and could therefore result in impact to vegetation and soil if not managed. As such, runoff from roads and hardstand areas will be directed to perimeter drainage and containment sumps.

For the duration of the project, water demand (dust suppression, crushing plant and domestic use) plus the annual evaporation is expected to be greater than the pit dewatering requirement. With average annual rainfall included, the total input marginally exceeds the demand (refer to Attachment 3B, Table 2.3), however, based on experience at the nearby Iron Ridge Project, it is anticipated that the pit dewatering requirement will be achieved with no requirement for discharge to the environment.

As such, there is no perceived need at this stage for disposal of excess water. In the event that water production exceeds consumption, there will be scope to reduce the rate of dewatering.

1.2 Hydrocarbons

Diesel will be stored in bulk tanks at the mining operation in three 100,000 litre self-bunded tanks. This will be the main source of fuel for mine vehicles and equipment, including the portable generators that will power the crusher, workshop and support facilities.

Fuel transfer points (refuelling of vehicles and fill points for the bulk tanks) will be located on impervious aprons. Aprons will be constructed with provision for collecting and recovering spills and/or rain water.

Engine and hydraulic oils will be bought to site and stored in 205 litre drums or 1000 litre IBCs. Smaller quantities of other hydrocarbon products, including lubricants and degreaser, will be stored in 20 litre drums. All will be stored within portable bunds that meet the requirements of AS 1940:2017 *The storage and handling of flammable and combustible liquids*.

A 5000 litre waste oil tank will be located at the workshop for temporary storage of used oil and other hydrocarbons. The tank will be positioned within a suitably sized bund that meets the requirements of AS 1940:2017 *The storage and handling of flammable and combustible liquids*. Waste oil will be removed from site at regular intervals for recycling by a licensed service provider.

Mobile refuelling and basic servicing of heavy equipment will be undertaken in the field by a service truck.

Spill kits will be provided at refuelling points and on the service truck. Used synthetic absorbents, such as polypropylene pads, will be removed from site with other hydrocarbon-contaminated waste. Organic absorbents and contaminated soil will be bioremediated on site in a designated area on the waste dump.