Identifier	Topic	Reference to EIS/EA Report	Summary of Comment	Proponent's Response	Subsequent Comment
			Date: March 2014	*Date: June 2015*	
EMRB-2	Air Quality		In addition, the report states that emission rates were further reduced by a conservative correction factor of 75% to account for the noted biases in the emission factors and the model itself. It is unclear however, whether the emission rates used in the model were adjusted to include this correction factor, particularly for the unpaved roadways, since insufficient information was provided to allow any spot checks of the correlation between the emission calculations and model inputs. As an example, segment lengths, vehicle trips, and weight for individual roadways were not provided. As such, the emission calculations for road dust and metals could not be verified. Details of whether this approach was used to reduce the emissions from any specific sources at the site should be included in the report.	A conservative control factor of 80% was applied to all the unpaved roads on the surface and within the open pit to account for the following: • Natural mitigation o 160 days per year with measurable precipitation or snow cover o 160/365 = 43.8% • Dust controls that will be implemented through a Best Management Practices Plan o Watering – 75% (Australian Government "National Pollutant Inventory Emission estimation Technique Manual for Mining: Version 3.1, January 2012, Table 4, Level 2 watering, greater than 2 L/m2 The overall control factor is the product of the individual control factors when more than one control is applied. Therefore the controlled emissions would be as low as (1-0.438) x (1-0.75) = 0.14 or 14% of the uncontrolled emissions. This is equivalent to an 86% control factor. This does not include any consideration for the biases in the model resulting from the conservative assumption of modelling all roads simultaneously, overestimates in the emissions due to the controlled vehicle speeds at the facility or any settling as per Watson Chow which would likely reduce the emissions greater than the 86% control factor applied to the emission rate. The predictive equation in U.S. EPA AP-42 Chapter 13.2.2 "*Unpaved Roads*" (November 2006) was used to calculate the fugitive dust emissions from the unpaved roadways. The equation is as follows: $EF = k\left(\frac{s}{12}\right)^{a} \times \left(\frac{W}{3}\right)^{b} \times 281.9 \times (1-80\%)$ *where: EF = particulate emission factor (g/VKT),* *k = empirical constant for particle size range (pounds per vehicle mile travelled) (Table 4-1),* *s = road surface silt content (%),* *W = average weight (tons) of the vehicles traveling the road,* *a= empirical constant for particle size range (dimensionless) (Table 4-1),* *b= empirical constant for particle size range (dimensionless) (Table 4-1),* *281.9 = conversion from pounds per vehicle miles travelled to grams per vehicle kilometres travelled,* *80% = reduction of emissions due to natural mitigation and best management practices to control fugitive dust.* The constants used for the unpaved roadways fugitive dust emissions. (See *attached* Table EMRB-2-1 ~~in Part 5 of this Addendum~~) Emission rates were calculated for 6 vehicle routes. Figure EMRB 2-1 *(attached)* ~~in Attachment 5 of this Addendum~~ displays how each route is made up of numerous road segments. The following is the calculation of the controlled emission factor used for all vehicle routes using a surface silt content of 9.14% (Table 1 Fugitive Dust BMPP Guidance Document, CEMI Aug 2010) and an average vehicle weight of 276 tonnes (304.9 tons) based on the assumption that a full truck weighs 390 tonnes and an empty truck weighs 163 tonnes and the truck drives there and back in one trip. $EF = 4.9\left(\frac{9.14}{12}\right)^{0.7} \times \left(\frac{304.9}{3}\right)^{0.45} \times 281.9 \times (1-80\%)$ $EF = 1827\ g/VKT$ The daily material throughput from the pits to each location was used to estimate the number of vehicle trips required for each vehicle route. Since only the total throughputs were provided for both pits, the pit volumes were used to estimate the amount of material coming from each pit. Table EMRB-2-3 *(attached)* ~~in Attachment 5 of this Addendum~~ shows how the daily throughputs were derived.	EMRB-2B

Identifier	Topic	Reference to EIS/EA Report	Summary of Comment	Proponent's Response	Subsequent Comment
			Date: March 2014	*Date: June 2015*	
				Table EMRB-2-4 *(attached)* ~~in Attachment 5 of this Addendum~~ shows the parameters that were used to estimate emissions for all the vehicle routes using a 227 tonne haul truck capacity to estimate the number of vehicle trips. The following is a sample calculation for the TSP emission rate from Ore-1: $ER = EF \times Daily\ Vehicle\ Kilometres\ Travelled \times \frac{1\ day}{24\ hr} \times \frac{1\ hr}{3600\ s}$ $ER = \frac{1827g}{km} \times \frac{\left(2.95 \frac{\text{km}}{\text{trip}} \text{(one way)} \times 2 \text{ (return)} \times 80 \text{ trips}\right) \text{km}}{1 \text{ day}} \times \frac{1 \text{ day}}{24\ hr} \times \frac{1\ hr}{3600\ s}$ $ER = 9.94\ g/s$ The emission rate for the entire route was divided according to length of the different road segments that make up that route. A sample calculation for RS-1 is provided. $ER_{RS-1} = ER_{Ore-1} \times \frac{Length\ of\ RS-1}{Length\ of\ Ore-1}$ $ER_{RS-1} = 9.94\ g/s \times \frac{0.84\ km}{2.94\ km}$ $ER_{RS-1} = 2.84\ g/s$ The emissions from each route were allocated to the various road segments in a similar manner and are shown in Table EMRB-2-5 in Part 5 of this Addendum. Since some vehicle routes use the same road segment, the sum of the emissions from each route on each road segment was calculated. Table EMRB-2-6 *(attached)* ~~in Part 5 of this Addendum~~ summarizes the emissions for each road segment. The emissions from RS-2 and RS-5 were allocated to the open pit source emissions. Emission rates for the remaining road segments were divided into smaller AERMOD sources, each 24 m in length. The number of AERMOD sources is directly related to the length of the road segment.(See *attached* Table EMRB-2-7 ~~in Part 5 of this Addendum~~) The emission rate per AERMOD segment was used in the dispersion modelling input file. **Attachments:** Figure EMRB-2-1: Dispersion Modelling Plan Table EMRB 2-1: Particle Size Constants for Unpaved Road Dust – Industrial Roads Table EMRB 2-2: Vehicle Route Descriptions Table EMRB 2-3: Daily Pit Throughputs Table EMRB 2-4: Daily Vehicle Route Data Table EMRB 2-5: Emission Rates for Each Vehicle Route Table EMRB 2-6: Emission Rates for Each Road Segment Table EMRB 2-7: Modelling Emission Rates for Each Road Segment	