



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

RISK ASSESSMENT IN TERMS OF REGULATION 8 OF THE WASTE EXCLUSION REGULATIONS

APPLICANT	Anglo American Platinum – Rustenburg Platinum Mines Limited
WASTE STREAM OR PORTION OF A WASTE STREAM TO BE EXCLUDED FROM THE DEFINITION OF WASTE	Slag generated in the Smelter by the pyro-metallurgical processing, of PGM Concentrates from a variety of Anglo American Platinum Concentrators
BENEFICIAL USE/S	Dust suppression on unsurfaced areas
	Abrasive for pneumatic air blasting
	<ul style="list-style-type: none"> • Mining materials <ul style="list-style-type: none"> ○ Rock Support (replacement of wood packs) ○ Insulation ○ Thin skin liners (rigid and flexible)
	<ul style="list-style-type: none"> • Building materials <ul style="list-style-type: none"> ○ Bricks (light and heavy) ○ Roofing (insulated or plain) ○ Walling (hollow core and insulated) ○ Castable insulation slabs ○ Castable /machinable profiles ○ Aggregate in standard building products ○ Light building products
	<ul style="list-style-type: none"> • Environmental <ul style="list-style-type: none"> ○ Cement foam for thermal or acoustic insulation ○ Thermal insulation
	Road aggregate, surfacing and underburden
	Construction fill
	Backfill
	Mineral fibres
	Rock wool

WASTE GENERATING FACILITY OR FACILITIES	Polokwane Metallurgical Complex		
PHYSICAL ADDRESS OF FACILITY OR FACILITIES	Palmietfontein Farm		
	Burgersfort Road, Polokwane		
GPS CO-ORDINATES OF WASTE GENERATING FACILITY OR FACILITIES	NUMBER OF CORNERS	LONGITUDE	LATITUDE
	1	29°27' 43.07"E	24°1' 57.08" S
	2	29°28' 8.72"E	24°1' 57.00" S
	3	29°28' 8.72"E	24°2' 1.69" S
	4	29°28' 6.58"E	24°2' 5.26" S
	5	29°28' 8.70"E	24°2' 7.03" S
	6	29°28' 8.75"E	24°2' 9.42" S
	7	29°28' 2.81"E	24°2' 15.84" S
	8	29°27' 58.78"E	24°2' 17.21" S
	9	29°27' 58.01"E	24°2' 15.02" S
	10	29°27' 43.17"E	24°2' 15.10" S
CONTACT PERSON			
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*DETAILED DESCRIPTION OF WASTE GENERATING PROCESS	<p>Concentrate is fed to two flash dryers that utilise coal-fired, fluidized-bed hot-gas generators to produce the hot gas that will drive off the moisture, leaving a fine bone-dry concentrate as furnace feed. The dry concentrate is pneumatically transferred to a storage silo before being transferred to the feed bins situated above the furnace. Lime, if required as a flux, may be transferred separately to the furnace feed bin by a pneumatic system.</p> <p>The concentrate and lime is fed from the feed bins into the electric furnace and concentrate is melted by energy generated when electric current passes through the electrodes and resistive slag layer. On melting, two</p>		

	<p>immiscible phases form: slag and matte. Furnace matte, containing the bulk of the base metal sulphides and PGMs, is denser than slag and collects naturally at the bottom of the furnace. Matte is tapped periodically through one of the two matte tap holes into 35-ton refractory-lined ladles, and cast into matte ingots on a casting machine. The cooled matte is discharged onto a concrete slab for cooling and then transferred by frontend loaders to the crushing plant. Slag is tapped from the furnace at temperature of approximately 1 600°C. The slag is sprayed with quenching water thereby granulating it to a particle size varying from 10 microns up to 4 mm. The slag is an amorphous glass-like black particle. It has an irregular surface with sharp edges due to the rapid cooling of the molten slag. It has a tendency to form fibre-like particles referred to as 'angel hair'. More than 93% of the slag is over 0.5 mm in size.</p> <p>The slag that is generated is then conveyed and trucked to the slag pad for storage.</p>	
PRODUCTION PROCESS FLOW CHART ATTACHED	YES	
WASTE CLASSIFICATION	HAZARDOUS	
IF WASTE IS HAZARDOUS LIST THE HAZARDS OF THE WASTE	<p>Slag does not represent chronic or acute aquatic toxicity and is therefore not classified as being Environmentally hazardous in terms of SANS 10234. Slag is however classified as having a potential health hazard (skin and eye irritant and single organ toxicity if ingested) to workers exposed without appropriate Personal Protective Equipment.</p>	
<p>*A process flow chart must be attached to the process description</p>		

RISK ASSESSMENT WITHOUT MITIGATION

Activity	Risk Description	Environmental Receptors	Assessment of Risk					Significance
			Impact	Probability	Magnitude	Duration	Scale	
Recovery of slag from stockpile, and deposition at users storage stockpile potentially generating dust to which the site operators are exposed on an ongoing and regular basis	Deterioration of workers health if the appropriate Personal Protective Equipment is not utilised when working with Slag and if continuous exposure persists, within the context that the density of the slag is such that it is unlikely to be significantly mobilised	Direct contact during handling	Site workers prolonged dermal contact with slag may lead to skin irritation through repeated and frequent exposure.	2	4	5	1	20
		Air	Site workers prolonged, frequent and repeated exposure may lead to eye irritation	2	6	5	1	24
Transportation between generator and users, generating dust	Other road users and communities along the transport route may experience a deterioration of health if repeatedly exposed for a sufficiently long period, within the context that the density of the slag	Air	Other road users and communities along the transportation route experiencing prolonged dermal contact with slag may lead to skin irritation through repeated and frequent exposure.	1	4	2	3	9
			Other road users and communities along the transportation	1	6	2	3	11

Activity	Risk Description	Environmental Receptors	Assessment of Risk					Significance
			Impact	Probability	Magnitude	Duration	Scale	
	is such that it is unlikely to be significantly mobilised		route experiencing prolonged, frequent and exposure may lead to eye irritation					
Raw material storage at site of reuse	If slag is not appropriately stored and runoff managed with the result that sediments wash from the stockpile onto adjacent soils and into adjacent water courses	Site soils and those onto which the slag is washed during rainfall Water courses into which slag is spilled or washed	Change in soil quality from baseline	4	4	4	1	36
Manufacturing using slag	Slag particulates actuated during manufacturing processes using slag, which then come into dermal contact, with a subsequent deterioration in workers' health	Air	Workers using slag in products experiencing prolonged, frequent and exposure may lead to eye irritation. Prolonged dermal contact with slag may lead to skin irritation through repeated and frequent exposure.	2	2	5	1	16
Storage of slag at users premise	Although the leach testing undertaken on	• Soil	Soil quality change from baseline	3	2	4	1	21

Activity	Risk Description	Environmental Receptors	Impact	Assessment of Risk				Significance
				Probability	Magnitude	Duration	Scale	
potentially generating leachate during rainfall	slag indicates that the leachable fractions are the below Leachate Concentration Threshold 1 of the Norms and Standards, mobilisation of low concentrations of salts and metals during rainfall may accumulate in the soils underlying the storage site	<ul style="list-style-type: none"> Groundwater users 						
	Although the leach testing undertaken on slag indicates that the leachable fractions are the below Leachate Concentration Threshold 1 of the Norms and Standards, mobilisation of low	Groundwater	Groundwater quality change from baseline	2	6	4	2	24

Activity	Risk Description	Environmental Receptors	Impact	Assessment of Risk				Significance
				Probability	Magnitude	Duration	Scale	
	concentrations of salts and metals during rainfall may migrate into the aquifer below the storage site							
	Although the leach testing on slag undertaken indicates that the leachable fractions are below the Leachate Concentration Threshold 1 of the Norms and Standards, mobilisation of low concentrations of salts and metals during rainfall into runoff that is then discharged to an adjacent water course may increase salt load of the water course	Surface water	Surface water quality change from baseline	2	6	4	3	26

The following factors and criteria must be used to assess the impacts of the activities:

Criteria	
MAGNITUDE (Severity)	DURATION
10 - Very high	5 - Permanent (longer than 10 years)
8 - High	4 - Long-term (5 to 10 years)
6 - Moderate	3 - Medium-term (12 months to 5 years)
4 - Low	2 - Short-term (0 to 12 months)
2 - Minor	1 - Immediate
SCALE	PROBABILITY (Likelihood)
5 - International	5 - Definite
4 - National	4 - Highly probable
3 - Regional	3 - Medium probability
2 - Local	2 - Low probability
1 - Site only	1 - Improbable
0 - None	0 - None

Magnitude

Magnitude measures the size of the impact

Duration

Duration refers to the lifetime of the impact i.e. how long it will last

Scale

The scale refers to the extent of the Impact.

Probability

The probability refers to the chance of impact to occur. The potential impact could be most likely to occur, unlikely, etc.

Assessment of Significance of impact

Significance rating of the potential impacts illustrates the importance of the impact itself. The size of area affected by pollution may be extremely high but the significance of this effect is dependent on the concentration or level of pollution in that area. In order to determine the significance of impact, the following method was used:

Significance Points (SP) = (Magnitude + Duration + Scale) x Probability

The values of SP are then ranged as follows:


Rating		Description
SP >60	Indicates high environmental significance	An impact which could influence the decision about whether or not to proceed with the activities regardless of any possible mitigation.
SP 30 – 60	Indicates moderate environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates low environmental significance	Impacts with little real effect and which will not have an influence on or require modification of the activities.
+	Positive Impact	An impact that is likely to result in positive consequences/effects

I, GORDON LESLIE SMITH. hereby declare that I have read the completed the Risk Assessment form and hereby confirm that the information is to the best of my knowledge true and correct.

Furthermore, I declare that I am fully aware of my responsibilities in terms of the Waste Exclusion Regulations, and that failure to comply with these Regulations may constitute an offence in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008).

Applicant (Full names) ANGLO AMERICAN PLATINUM -
RUSTENBURG PLATINUM MINES LTD.

Designation EXECUTIVE : TECHNICAL

Signature  G. SMITH.

Date 21 AUGUST 2018 Place JOHANNESBURG

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Date Received			
Decision Taken	Authorised		Not Authorised (provide reasons)
Reference Number			

