Appendix E

IMPACT ASSESSMENT

The significance of identified impacts was determined using the approach outlined below (te
and Tourism Guideline document on EIA Regulations, April 1998). This approach incorpora
impacts, namely occurrence and severity, which are further sub-divided as follows:

Table 1: Impact assessment factors

Occurrence		**Severity**
Probability of occurrence	Duration of occurrence	Scale/extent of impact

To assess these factors for each impact, the following four ranking scales are used:

Table 2: Impact assessment scoring methodology

Magnitude	**Duration**
10- Very high/ unknown	5- Permanent (>10 years)
8- High	4- Long term (7-10 years, impact ceases after site closure has been obtained)
6- Moderate	3- Medium-term (3 months- 7 years, impact ceases after the operational life of the activity)
4- Low	2- Short-term (0-3 months, impact ceases after the construction phase)
2- Minor	1- Immediate
Scale	**Probability**
5- International	5- Definite/Unknown
4- National	4- Highly Probable
3- Regional	3- Medium Probability
2- Local	2- Low Probability
1- Site Only	1- Improbable
0- None	0- None

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

Table 3: Significance of impact based on point allocation

Points	**Significance**	**Description**
SP>60	High environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30-60	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	Low environmental significance	Impacts with little real effect and which will not have an influence on or require modification of the project design.
+	Positive impact	An impact that is likely to result in positive consequences/effects.

For the methodology outlined above, the following definitions were used:

- **Magnitude** is a measure of the degree of change in a measurement or analysis (e.g., the concentration of a metal in water compared to the water quality guideline value for the meta none/negligible, low, moderate or high. The categorization of the impact magnitude may be health risk levels, ecological concepts and/or professional judgment) pertinent to each of th questions analysed. The specialist study must attempt to quantify the magnitude and outline widely-recognised standards are to be used as a measure of the level of impact;

- **Scale/Geographic** extent refers to the area that could be affected by the impact and is cl national, or international;

- **Duration** refers to the length of time over which an environmental impact may occur: i.e. to 7 years), medium term (8 to 15 years), long-term (greater than 15 years with impact ceas permanent; and

- **Probability of occurrence** is a description of the probability of the impact actually occurr chance), low probability (5% to 40% chance), medium probability (40% to 60% chance), hig 90% chance) or definite (impact will definitely occur).

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ıtes two aspects for assessing the potential significance of

Magnitude of impact

ɜ area of pasture, or the
ul), and is classified as
based on a set of criteria (e.g.
e discipline areas and key
ɜ the rationale used. Appropriate,

assified as site, local, regional,

immediate/transient, short-term (0
ɜing after closure of the project), or

ing as improbable (less than 5%
ghly probable (most likely, 60% to

ACTIVITY *whether listed or not listed.* *(E.g. Excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc…etc…etc.).*	POTENTIAL IMPACT *(e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater contamination, air pollution etc….etc…)*	ASPECTS AFFECTED	PHASE In which impact is anticipated *(e.g. Construction, commissioning, operational Decommissioning, closure, post-closure)*	Magnitude	Duration	Scale	Probability	Significance	Significance wwhout Mitigation	Magnitude	Duration	Scale	Probability	Significance	Significance with Mitigation	EMPR Ref. No.	Detailed Mitigation Measures	Mitigation Type (Modify, remedy, control or stop) *e.g. Modify through alternative method; Control through noise control; Control through management and monitoring; Remedy through rehabilitatio n*	Time period for implementation *(time period when the measures in the environmental management programme must be implemented Measures must be implemented when required)*	Standards to be Achieved *(Impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives etc)*	Compliance with Standards *(A description of how each of the recommendations made, will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities)*	Responsible person
Decommissioning and Rehabilitation Phase																					
Groundwater																					
Removal of waste within the slurry ponds: The use of hydrocarbons to fuel and lubricate earth moving equipment	Hydrocarbon spillages and leaks from the construction vehicles with the potential to contaminate soil and groundwater system	Soil and groundwater	Decommissioning and rehabilitation	6	2	2	2	20	Low	1	2	2	2	10	Low	2.1	Use drip trays to capture any hydrocarbon leaks/spillages during decommissioning. Avoid soil contamination and remediate immediately when applicable.	Control through management and monitoring	During operation and post operation	National Water Act, 1998, (Act No. 36 of 1998)	Standards can be attained by implementing remedial measures	Tubatse Environmental manager, appointed contractors
Removal of waste within the slurry ponds: Spillage of slurry waste/dust enroute to the H:H facility with the potential to spread Chromium enriched sources	Dispersed slurry dust will be exposed to rainwater, washed to surface water resources or infiltrate to groundwater resource.	Soil, surface water and groundwater	Decommissioning and rehabilitation	6	2	1	2	18	Low	1	2	1	2	8	Low	2.2	-Regular loads monitoring and clean up actions when spillages are observed. -Material transportation to be done in a manner which minimises dust generation and spillages.	Control through management and monitoring	During operation and post operation	National Water Act, 1998, (Act No. 36 of 1998)	Standards can be attained by implementing remedial measures	Tubatse Environmental manager, appointed contractors
Removal of waste within the slurry ponds: Compromise of groundwater quality will continue until all waste has been removed	Source will continue to leach to ground water, further compromising groundwater quality with Cr6+ until the material is removed from the slurry pond.	Groundwater quality	Decommissioning and rehabilitation	6	4	2	2	24	Low	2	4	2	2	16	Low	2.3	Groundwater monitoring and remediation shall continue until water quality improves.	Control through management and monitoring	During operation and post operation	National Water Act, 1998, (Act No. 36 of 1998)	Standards can be attained by implementing remedial measures	Tubatse Environmental manager, appointed contractors
Surface water																					
Conducting decommissioning and rehabilitation without adequate storm water infrastructure	Mobilisation of contaminated storm water to the receiving environment	Nearby watercourse	Decommissioning and rehabilitation	4	2	1	2	14	Low	2	1	1	2	8	Low	3.1	Ensure temporary measures are in place for storm water management	Modify	Duration of the Decommissioning activities	National Water Act, 1998, (Act No. 36 of 1998) Current WUL conditions to be complied with	With the recommended measures in place, compliance with the guidelines can be achieved	Appointed Contractors
Terrestrial Biodiversity																					
Decommissioning activities	- Establishment and spread of alien and invasive species; - Injury and mortality of fauna	Fauna and flora	Decommissioning and rehabilitation	6	2	2	2	20	Low	4	2	1	2	14	Low	4.1	- Develop a work instruction / management procedure for the correct handling and disposal of hydrocarbons and CRP waste. The aim of the procedure must be to limit the impact to the soil, air, surface or groundwater and to remediate spillage that does occur; - Ensure that all CRP waste is disposed of at the appropriate facilities (Area 1 and Slag Dump E).	Control through management and monitoring	Duration of the Decommissioning activities	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	With the recommended measures in place, compliance with the guidelines can be achieved	Environmental Coordinator
Noise																					
Decommissioning activities	Noise and vibration impact associated with the decommissioning of Area 5 ; Removal and transport of the CRP waste will involve similar noise emissions or even less than what is emitted during the operations at Tubatse	Noise quality and social	Decommissioning and rehabilitation	6	2	2	4	40	Moderate	4	2	1	2	14	Low	5.1	Proper processes and necessary supervision must be adhered regarding waste removal and transport must only take place during operational hours.	Control through management and monitoring	Duration of the Decommissioning activities	Noise generation must be managed in accordance with the: - NEM:AQA. 2004 Regulation 6(1); - NRTA, 1996; - SANS 10103 - Acceptable Ambient Noise Levels	With the recommended measures in place, compliance with the guidelines can be achieved	Environmental Coordinator
Air Quality																					
Decommissioning activities : Removal and transport of the CRP waste	Impact on air quality as a result of dust liberation during the decommissioning of Area 5	Air quality and social	Decommissioning and rehabilitation	8	2	2	5	60	Moderate	4	2	1	2	14	Low	6.1	- All transport vehicles and other equipment should be maintained and serviced regularly to ensure that tailpipe particulate emissions are kept to a minimum; - Wet suppression on all access roads; - The onsite speed control and established site traffic management plan which were developed on a risk-based approach must be adhered to - Wet suppression during materials handling activities	Control through management and monitoring	Duration of the Decommissioning activities	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004); Dust management plan (2021)	Daily inspections by the Environmental Coordinator	Environmental Coordinator
Socio-economic																					
Decommissioning activities	- Dust emissions from movement of transport vehicles and equipment; - Noise vibrations from the use of machinery and transportation vehicles; - temporary increase in employment opportunities	Socio-economic	Decommissioning and rehabilitation	6	2	2	4	40	Moderate	2	2	2	2	12	Low	7.1	- All transport vehicles and other equipment should be maintained and serviced regularly to ensure that tailpipe particulate emissions are kept to a minimum; - Wet suppression on all access roads; - The onsite speed control and established site traffic management plan which were developed on a risk-based approach must be adhered to; - Wet suppression during materials handling activities.	Modify	Duration of the Decommissioning activities	National Environmental Management Act 36, (Act 36 of 1998)	With the recommended measures in place, compliance with the guidelines can be achieved	SBPM Environmental Manager, ECO, Appointed Contractors
Post-Decommissioning and Rehabilitation Phase																					
Surface water																					
Unstable surface	Disturbance to the environment	Environment	Post-decommissioning Phase	4	2	1	2	14	Low						Positive	8.1	- Implement proper rehabilitation measures	Remedy through rehabilitation	After decommissioning	National Water Act, 1998, (Act No. 36 of 1998)	With the recommended measures in place, compliance with the guidelines can be achieved	MPM Environmental Leader, ECO, Appointed Contractors
Rehabilitated area	Improvement in overall surface water management in the area	Improve impact to the environment	Post-decommissioning Phase						Positive						Positive	8.2	NA	NA	NA	NA	NA	NA
Groundwater																					
Improvement of water quality around the Area 5	Post decommissioning, the groundwater quality in Area 5 will improve. Once water quality improves to the remediation objective, then the need for pump and treat around Area 5 may not be applicable and local water levels will recover.	Groundwater quality	Post-decommissioning Phase	4	2	2	2	16	Low	1	1	1	0	0	Positive	9.1	Groundwater level and quality monitoring will continue post closure. When groundwater quality has improved below the WUL levels, the pump and treat system will not required	Control through management and monitoring	Operation, rehabilitation and post closure	Current WUL conditions to be complied with	Standards can be attained by implementing remedial measures	Tubatse Environmental manager, appointed contractors

Source Activity	Impacts Requiring Monitoring Programmes	Functional Requirements for Monitoring
Decommissioning and rehabilitation phases	Noise	A once-off noise monitoring campaign is recommended in accordance with the SANS methodology to ensure that noise levels are restored.
Decommissioning and rehabilitation phases	Groundwater	- Monitoring of groundwater around Area 5 shall continue as per the current WUL conditions (03/B41J/AG/4545) and pending water quality improvement around the decommissioned slurry pond area the rehabilitation system may have to be ceased post decommissioning. - Monitoring boreholes must be equipped with lockable caps.
Decommissioning and rehabilitation phases	Surface Water	- Continue with surface water quality monitoring as per the current WUL conditions (03/B41J/AG/4545). In the event of non-compliance conduct an investigation to determine if the impact arose from Area 5. - Increase surface water monitoring frequency during the decommissioning and rehabilitation phase to ensure no impact from these activities arises.

Roles and Responsibilities *(For the execution of the monitoring programmes)*	**Monitoring and Reporting Frequency and Time Periods for Implementing Impact Management Actions**
ECO, Appointed Contractors	Once-off
ECO, Appointed Contractors	Internal Audits: Quarterly; External Audits: Annual
ECO, Appointed Contractors	Internal Audits: Quarterly; External Audits: Annual