

APPENDIX C – EMP Framework

EMP Framework

The EMP Framework comprises the following:

- A table (Table 1) for tracking impacts to the mitigation measures to the phase of the development where these are applicable. The purpose of this table is to provide a mechanism for checking that all impacts identified and for which mitigation measures are proposed are addressed in the design, construction and/or implementation of the proposed development.
- A table for each phase of development (Tables 2, 3 and 4) in which the mitigation measures are detailed. The purpose of this table is to provide for tracking and monitoring of the implementation of the EMP.

TABLE 1: Mitigation measures in relation to project phase / lifecycle

POTENTIAL IMPACTS	SIGNIFICANCE		MITIGATION MEASURES	RELEVANT PHASE		
	Before	After		Design	Construction	Operation
ISSUE: AIR QUALITY						
Health impacts due to particulates from stack emissions	H	L	<ul style="list-style-type: none"> A bagfilter will be installed on the stack, using a technology that has a proven 95% efficiency. 	✓		✓
Pollution of soil from deposition of heavy metals contained in air emissions	H	L	<ul style="list-style-type: none"> A bagfilter will be installed on the stack, using a technology that has a proven 95% efficiency. 	✓		✓
ISSUE: ECOSYSTEMS / BIODIVERSITY						
Disruption of the functioning of the wetland due to construction activities	H	L	<ul style="list-style-type: none"> The construction EMP must include a specification that the wetland is clearly demarcated. 		✓	
			<ul style="list-style-type: none"> A method statement for monitoring of the wetland must be included in the construction EMP. 			
Degradation of the wetland due to effluent or polluted water from the factory	H	L	<ul style="list-style-type: none"> An effluent treatment plant will be installed, which will remove heavy metals from the effluent stream to achieve the required DWAF standard. 	✓		✓
			<ul style="list-style-type: none"> No effluent will be discharged to the wetland as the treated effluent will be used for irrigation of gardens and to control dust on gravel roads. 			

TABLE 2: EMP FRAMEWORK: Design Phase Mitigation Measures (Worked Example)

POTENTIAL IMPACTS		MITIGATION MEASURES			Responsibility	Completion date	Sign off	
ISSUE: AIR QUALITY								
Health impacts due to particulates from stack emissions	<ul style="list-style-type: none"> Plant design includes bagfilter using technology that has a proven 95% efficiency. 							
Pollution of soil from deposition of heavy metals contained in air emissions								
ISSUE: ECOSYSTEMS / BIODIVERSITY								
Degradation of the wetland due to effluent or polluted water from the factory	<ul style="list-style-type: none"> Plant design includes effluent treatment plant to remove heavy metals from the effluent stream to achieve the required DWAF standard. Effluent discharge outlet is to a holding pond, from which water can be abstracted for irrigation purposes. The holding pond is designed to prevent leaks, including a leak detection system. 							

NOTE: There are no monitoring requirements applicable to the design phase. The design phase documents should be subject to an audit against the mitigation measures that have been proposed for inclusion in the design. This is the purpose of having a tracking and sign-off system (columns 3-5 in above table).

TABLE 3(a): EMP FRAMEWORK: Construction Phase Mitigation Measures (Worked Example)

POTENTIAL IMPACTS		MITIGATION MEASURES			Responsibility	Completion date	Sign off
ISSUE: ECOSYSTEMS / BIODIVERSITY							
Disruption of the functioning of the wetland due to construction activities		<ul style="list-style-type: none"> Clearly demarcate wetland. Develop method statement for monitoring of the wetland, which includes frequency of monitoring, a monitoring protocol and record keeping. 					

TABLE 3(b): EMP FRAMEWORK: Construction Phase Monitoring Requirements (Worked Example)

POTENTIAL IMPACTS		MONITORING REQUIREMENTS			Responsibility	Completion date	Sign off
ISSUE: ECOSYSTEMS / BIODIVERSITY							
Disruption of the functioning of the wetland due to construction activities		<ul style="list-style-type: none"> Take photographs of wetland conditions prior to commencement of construction activities. Keep photographic record of the condition of the wetland throughout construction. Take water samples from wetland and analyse for relevant constituents using the DWAF Water Quality Guideline for Aquatic Systems before construction commences and during construction at the frequency specified by the specialist. Undertake visual inspections of the wetland to identify whether any disturbance from construction activities is occurring. 					

TABLE 4(a): EMP FRAMEWORK: Operational Phase Mitigation Measures (Worked Example)

POTENTIAL IMPACTS	MITIGATION MEASURES	Responsibility	Completion date	Sign off
ISSUE: AIR QUALITY				
Health impacts due to particulates from stack emissions	<ul style="list-style-type: none"> Develop operating procedures for the bag filter in accordance with permit requirements. 			
Pollution of soil from deposition of heavy metals contained in air emissions	<ul style="list-style-type: none"> Ensure that the bagfilter has a planned maintenance programme. 			
ISSUE: ECOSYSTEMS / BIODIVERSITY				
Degradation of the wetland due to effluent or polluted water from the factory	<ul style="list-style-type: none"> Ensure that the effluent treatment plant has a planned maintenance programme. Develop operating procedures in accordance with permit requirements. 			

TABLE 4(b): EMP FRAMEWORK: Operational Phase Monitoring Requirements (Worked Example)

POTENTIAL IMPACTS		MONITORING REQUIREMENTS			Responsibility	Completion date	Sign off
ISSUE: Ecosystems / biodiversity							
Health impacts due to particulates from stack emissions	<ul style="list-style-type: none"> Monitor emissions during bag filter commissioning and testing phase to ensure efficiency levels are being achieved. 						
Pollution of soil from deposition of heavy metals contained in air emissions	<ul style="list-style-type: none"> Implement an air quality monitoring programme in accordance with permit requirements and to check efficiency of air cleaning equipment. 						
ISSUE: ECOSYSTEMS / BIODIVERSITY							
Degradation of the wetland due to effluent or polluted water from the factory	<ul style="list-style-type: none"> Monitor effluent quality in plant commissioning and testing phase. Implement effluent quality monitoring procedures for the parameters required in the DWAF permit. Implement a monitoring programme for the wetland to evaluate its ecological functioning on an ongoing basis (e.g. record of species over time). Undertake visual inspections of the wetland to identify whether any degradation is occurring. 						