



Environmental and Social Management Plan

SCHEDULE 16: Appendix - ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) - Status as per 28.07.2021

This section summarises the recommended mitigation and management measures in the format of a Management Plan, which is presented in tabular form below. The last four columns indicate the phase /phases in which the particular measure should be implemented: -

1. Planning & Design phase, start date: 01.05.2007 completed: est. 31.07.2010.
2. Construction phase, start date: 01.11.2008 completed: est. 01.12.2010.
3. Operations phase, start date: est. 01.12.2010 completed: after approx. 100 years of operation
4. Closure phase, after approx. 100 years of operation

It must be emphasised that environmental and social management requires careful planning and timeous implementation of the recommended measures. The status of implementation is indicated as follows: completed in progress

Topic	Environmental Concern	No.	Management & Monitoring Recommendations	Project Phase				Remark
				1 Plan	2 Constr.	3 Ops.	4 Close	
Quarry	Potential slope failure with risk to staff, machinery or equipment	1.1	Ensure that slopes are not over-steepened, with input from a mining engineer if necessary					1 - Plan: See Mining Plan 2 - Constr: Begin of Quarry Establ. Aug. 2008 3 - Ops: Quarry in Operation since Sep. 2010
	Potential erosion of topsoil	2.1	Remove topsoil from all areas to be disturbed (excavated, factory site, quarry site - progressive, coal stockpile areas, paved areas, parking areas etc) and stockpile for later use.					1 - Plan: See Mining Plan 2 - Constr: Begin Nov. 2008 3 - Ops: Quarry in Operation since Sep. 2010
	Potential erosion of soil stockpiles	2.2	Keep vegetation in topsoil stockpiles or cover stockpiles with cleared vegetation.					2 - Constr: Begin Nov. 2008 3 - Ops: Quarry in Operation since Sep. 2010
		2.3	Stockpile topsoil in conical heaps not exceeding 2m in height to allow oxygen to enter the soil					2 - Constr: Begin Nov. 2008 3 - Ops: Quarry in Operation since Sep. 2010
		2.4	Remove and stockpile subsoil separately.					2 - Constr: Begin Nov. 2008 3 - Ops: Quarry in Operation since Sep. 2010
Quarry		2.5	Maintain stockpiles against erosion.					2 - Constr: Begin Nov. 2008 3 - Ops: Quarry in Operation since Sep. 2010
		2.6	Allow grass to grow on stockpiles.					2 - Constr: Begin Nov. 2008 3 - Ops: Quarry in Operation since Sep. 2010
		2.7	On noise prevention barriers, place 200 – 300mm of topsoil over the berm to allow grass to grow					2 - Constr: Begin Nov. 2008 3 - Ops: Quarry in Operation since Sep. 2010
Quarry	Rehabilitation	3.1	As each section of the quarry is worked out, the stockpiled topsoil should be used to cover the terraces, in order to allow natural vegetation to re-establish.					1 - Plan: See Mining Plan
		3.2	Replace soil on ramps in the quarry. Subsoil should be replaced followed by 200 – 300 mm topsoil on top of the subsoil.					
		3.3	Put completed ground to allow vegetation to grow.					
		3.4	Ensure that an Environmental Rehabilitation Trust is available					Ohorongo Cement Rehabilitation Trust

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Quarry	Potential for sinkholes	4.1	Deep drilling in the limestone to ensure that there are no large cavities that could pose a risk to mine safety.						1 - Plan: See Exploration drilling 2 - Constr: See Exploration drilling 3 - Ops: Quarry In Operation since Sep., 2010
	Impacts on vegetation: Quarry	5.1	An effort should be made to avoid or minimize the mining of the most sensitive zone shown in dark green in Figure 5 – the "Steep limestone hill". This could possibly be achieved by expanding the quarry to the west after the first 25 years.						1 - Plan: See Mining Plan 2 - Constr: Begin of Quarry Establ. Aug. 2009
		5.2	A plant rescue operation by the NBR is recommended for the zone shown in yellow in Figure 5 – the "intermontane valley". This will need to be initiated by Ohorongo at the appropriate time(s) prior to removal of the topsoil and during or just after the rainy season.						1 - Plan: Draft plan under preparation for 2030 2 - Constr: Draft plan under preparation for 2030 3 - Ops: Draft plan under preparation for 2030
Quarry		5.3	Clear vegetation only to the extent that is necessary for operation.						1 - Plan: See Mining Plan 2 - Constr: Begin of Quarry Establ. Aug. 2009 3 - Ops: Quarry In Operation since Sep., 2010
		5.4	Do not clear vegetation a long time in advance of the quarrying operation.						1 - Plan: See Mining Plan 2 - Constr: Begin of Quarry Establ. Aug. 2009 3 - Ops: Quarry In Operation since Sep., 2010
Quarry	Noise from quarry & crusher	6.1	De-watering of Quarry must be controlled and communicated with neighbouring farms and affected parties, because the increased run-off from the quarry will cause erosion in depressions and the areas can have impact on soil erosion and vegetation development.						3 - Ops: See de-watering permits
		6.2	Blasting Prohibited at night.						1 - Plan: Organizational Instructions in place 2 - Constr: Organizational Instructions in place 3 - Ops: Organizational Instructions in place
	Air quality from quarry, crusher & unpaved roads	6.3	Design of crusher houses to contain/ dampen noise.						1 - Plan: See Plant Layout
		7.1	Maintain silencers on vehicles, pumps etc. See recommendations for topsoil above (use of vegetation)						1 - Plan: See Mining Plan 2 - Constr: Begin of Quarry Establ. Aug. 2009 3 - Ops: Quarry In Operation since Sep., 2010
		7.2	Avoiding clearing vegetation except where absolutely necessary.						2 - Constr: Begin Nov. 2008 3 - Ops: Quarry In Operation since Sep., 2010
Groundwater	Aquatic fauna in karst "wet" caves	7.3	Storing dust generating areas where necessary.						2 - Constr: Begin Nov. 2008 3 - Ops: Quarry In Operation since Sep., 2010
		7.4	Design of housing and filters for crusher.						2 - Constr: Begin Nov. 2008 3 - Ops: Quarry In Operation since Sep., 2010
Groundwater		7.5	Design of housing for conveyors.						2 - Constr: Begin Nov. 2008 3 - Ops: Quarry In Operation since Sep., 2010
		8.1	Annual monitoring of water levels in Karst "wet" caves to determine whether there are any significant impacts of a cumulative nature due to abstraction in the region and/or climate change. This should be the responsibility of Water Affairs, but Ohorongo will probably need to initiate this with Water Affairs, Directorate of Geohydrology.						1 - Plan: See Plant Layout 1 - Plan: Data Collection Ongoing 3 - Ops: Data Collection Ongoing
Groundwater	Groundwater table	9.1	Obtain necessary abstraction permit from Water Affairs & comply with permit requirements.						1 - Plan: Permit issued 06.12.2008 2 - Constr: Monitoring Completed 3 - Ops: Monitoring Ongoing
		9.2	Undertake test pumping of a further 3 boreholes as proposed to further confirm the water resources and characteristics of the aquifer.						1 - Plan: Hydrology Report WSCC
		9.3	Borehole census of all boreholes within 3km of the proposed abstraction boreholes.						1 - Plan: Hydrology Report WSCC
		9.4	Annual borehole census of the same boreholes as above to determine whether there is any progressive lowering of the water table over time – i.e. confirm sustainability of water resources in the long term – allowing for climate change and cumulative impacts.						2 - Constr: Monitoring Completed 3 - Ops: Monitoring Ongoing
		9.5	Check the discharge of the spring 6km to the north annually.						1 - Plan: Data Collection finished 2 - Constr: Data Collection finished 3 - Ops: Monitoring Ongoing

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General Plant Area	Impacts on vegetation: Access Road	15.1 Design for the "orange route" shown in Figure 2. 15.2 Minimise the width of vegetation cleared on either side of the road to reduce dust and noise.				1 - Plan: Design Bühmann&Partner 1 - Plan: Design Bühmann&Partner see Energy for Future Project
General Plant Area	Alien invasive plants	16.1 Ongoing monitoring (by a suitably qualified person) and prompt eradication of any alien invasive species that emerge. 17.1 Prevent access to artificial water bodies (e.g. sewage treatment ponds).				1 - Plan: Application for WWT Construction Phase 2 - Constr: Begin Nov. 2008, temporarily 3 - Ops.: WWT OC in fenced area 2 - Constr: Road signs established 3 - Ops.: Road signs established 2 - Constr: Game Fencing 2 - Constr: Game Fencing
General Plant Area	Potential fatalities to wildlife and birds	17.2 Enforce speed limits on access road (120 km/h as per National Road Standards). 17.3 Prevent potholes and potholes. 17.4 Prevent creation of barriers from litter (especially plastic, bottles, wire, cans etc) and general waste. 17.5 Avoid any vulture nests during May- November.				2 - Constr: Monitoring Completed 1 - Plan: Design Bühmann&Partner 1 - Plan: Design Bühmann&Partner 1 - Plan: Design Bühmann&Partner 1 - Plan: Design Bühmann&Partner
General Plant Area	Access Road	18.1 Route the access road according to the "orange route" in Figure 2. to 18.2 Select a safe location for intersection with the B1 tar road. 18.3 Design road with gentle curves to discourage speeding. 18.4 Enforce speed limits on access road (120 km/h as per National Road Standards). 18.5 Consult affected farm owners. 18.6 Consult with Roads Authority. 18.7 Follow alignment of new access road. 18.8 The line should be a minimum of 100m from any dwelling or workplaces. 18.9 Bird flappers should be attached to the conductors (or earth wire) if any bird fatalities occur.				1 - Plan: Design Bühmann&Partner 2 - Constr: Road signs established 1 - Plan: Design Bühmann&Partner 1 - Plan: Design Bühmann&Partner Responsibility of Nampower (own EIA) Responsibility of Nampower (own EIA) Responsibility of Nampower (own EIA)
General Plant Area	New power line	19.2 The line should be a minimum of 100m from any dwelling or workplaces. 19.3 Bird flappers should be attached to the conductors (or earth wire) if any bird fatalities occur.				1 - Plan: Design Bühmann&Partner 2 - Construction completed
General Plant Area	Noise from plant	20.1 Design to meet SABS standard of 55dBA at 3km from the plant. 20.2 Design alignment as far from dwellings as space allows. 21.2 Construct earth berms within 10m of dwellings. 21.3 Plant road surfaces, at least near dwellings. 21.4 Construct earth berms at night (12 hours /night). 21.5 Minimise removal of vegetation alongside the road except as necessary for road safety. 21.6 Maintain silencers on vehicles. 21.7 Secure loads to prevent banging noise.				1 - Plan: Design Bühmann&Partner 2 - Constr: Completed 28.12.2008 1 - Plan: Design Bühmann&Partner 1 - Plan: Design Bühmann&Partner
General Plant Area	Major roads	22.1 Location of intersection with B1 tar road far from bend. 22.2 Construct turning lanes on both sides of the road. 22.3 Avoid overloading vehicles. 22.4 Driver training.				1 - Plan: Design Bühmann&Partner 1 - Plan: Design Bühmann&Partner
General Plant Area	Air quality from plant	23.1 Design with state of the art technology to minimise air emissions from the kilns and grinding mills. 23.2 Use of bag filters, baghouse filters to reduce toxic emissions from coal and also to "recycle" atmospheric carbon. 23.3 Measurement of fugitive dust should be done				1 - Plan: See Plant Layout 2 - Plan: Maintain dustfall, filters see Energy for Future Project 1 - Plan: Fugitive dust is monitored and recorded.
General Plant Area	Electricity Consumption	24 Increase usage of alternative fuels 24.1 Cost of fuel 24.2 Reduce thermal energy consumption 24.3 Maintain low electrical energy consumption at Cement Plant 24.4 Reduce noise pollution 24.5 Maintain low level of Air Pollution 24.6 Reduce fuel consumption 24.7 Reduce power usage 24.8 Reduce water consumption 24.9 Reduce oil spillages 24.10 Design to minimise electricity consumption. 24.11 Install solar water heaters.				1 - Ops: See Targets & Objectives - GU.21.01.00.01.02 1 - Ops: See Targets & Objectives - GU.21.01.00.01.02 1 - Ops: See Targets & Objectives - GU.21.01.00.01.02 1 - Ops: See Targets & Objectives - GU.21.01.00.01.02 1 - Ops: See Targets & Objectives - GU.21.01.00.01.02 1 - Ops: See Targets & Objectives - GU.21.01.00.01.02 1 - Ops: See Targets & Objectives - GU.21.01.00.01.02 1 - Ops: See Targets & Objectives - GU.21.01.00.01.02 1 - Ops: See Targets & Objectives - GU.21.01.00.01.02 1 - Ops: See Targets & Objectives - GU.21.01.00.01.02 1 - Plan: Design Phase Ongoing 2 - Constr.: Construction completed 3 - Ops.: Construction completed
General Plant Area	Potential stock and theft / security problems	25.1 Use energy efficient lighting, appliances and equipment. 25.2 Establish access control. 25.3 Conditions of employment should include security requirements.				1 - Plan: Fencing/Contract Rubicon 2 - Constr: Fencing/Contract Rubicon 1 - Plan: Fencing/Contract Rubicon 2 - Constr: Fencing/Contract Rubicon 3 - Ops.: Fencing/Contract Rubicon

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General Plant Area	Visual Impacts	26.1 Avoid lighting facades of tall buildings.							
Infrastructure	Housing	26.1 Prior consultation with the relevant local authorities.							Responsibility of Organisation who will erect houses
		27.1 Compliance with local authority bylaws.						Responsibility of Organisation who will erect houses	
		27.2 Appropriate town planning and service provision.						Responsibility of Organisation who will erect houses	
		27.3 In line with local and mutually agreed standards						Responsibility of Organisation who will erect houses	
Emergency service provider	Health & emergency services	28.1 Planning of emergency procedures.						1-Plan:MERP 2-Const: MERP 3-Ois: Xerf/MERP	
		28.2 Prior understandings with emergency service providers.						1-Plan: MERP 2-Const: MERP 3-Ois: Xerf/MERP	
		28.3 Training of on-site personnel in first aid and emergency procedures.						1-Plan: MERP 2-Const: MERP 3-Ois: Xerf/MERP	
Emergency service provider	Occupational Health & Safety	28.1 Design and manage to comply with SABS 1020 (2009) standard for dust in the workplace (or comparable EU standard).						1-Plan:MERP 2-Const: Contract 3-Ois: OC H&S Manual/MERP	
		28.2 Design and manage to comply with SABS 10083 (2004) standard for noise (or comparable EU standard).						1-Plan:MERP 2-Const: Contract 3-Ois: OC H&S Manual/MERP	
		28.3 Design and manage to comply with the Labour Act of Namibia.						1-Plan:MERP 2-Const: Contract 3-Ois: OC H&S Manual/MERP	
Emergency service provider	HIV/AIDS	30.1 Training and awareness creation of the risks of HIV/AIDS and prevention thereof.						1-Plan: Training ongoing 2-Const: Training ongoing 3-Ois: see XERI HIV/AIDS Policy	
		30.2 Develop and implement HIV/AIDS, malaria prevention measures during construction						1-Plan: Training ongoing 2-Const: Training ongoing 3-Ois: see XERI HIV/AIDS Policy	
		30.3 Ongoing training and up-skilling of staff to replace losses due to deaths from AIDS related diseases.						1-Plan: See HR Policy 2-Const: Under preparation 3-Ois: See HR Policy	
		30.4 Implement ILO Code HIV/AIDS at Work						1-Plan: See HR Policy 2-Const: See HR Policy 3-Ois: See HR Policy	
Organisation	Contractor/Sub-Contractor Management	31.1 to implement a HR Management in line with national and international standards						1-Plan: See Salary&Health Manual 2-Const: Monitoring Ongoing	
		31.2 to develop a transparent recruitment policy and procedures that is accessible also for local people						1-Plan: See Salary&Health Manual 2-Const: Monitoring Ongoing	
Organisation	Contractor/Sub-Contractor Management	32.1 Establish a contractor/sub-contractor management in line with local and international standards which communicates key aspects to contractors/sub-contractors in a concrete, understandable way and includes regular monitoring of working and living conditions of contractor/sub-contracted workers and includes grievance mechanism for contractor/sub-contracted workers						1-Plan: See Salary&Health Manual 2-Const: Monitoring Ongoing	
		32.2 workers camp in line with local and international standards						1-Plan: See Salary&Health Manual 2-Const: Monitoring Ongoing	



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Organisation	Supply-chain Management	33.1 Establish a supply-chain management in line with local and international standards, mainly for coal, gypsum, transportation								
Organisation	Community Relation Management	34.1 regular community consultation and engagement								2 - Constr: see O/L/OG Documents 3 - Ops: see O/L/OG Documents 1 - Plan: See Public Relations Management 2 - Constr: Regular Communication 3 - Ops.: see www.ohorong-cement.com
	Community Relation Management	34.2 community grievance mechanism								1 - Plan: See Public Relations Management 2 - Constr: Regular Communication 3 - Ops.: see www.ohorong-cement.com
	Community Relation Management	35.1 Regular communications to the public considering interest of main stakeholder groups								1 - Plan: See Public Relations Management 2 - Constr: Regular Communication 3 - Ops.: see www.ohorong-cement.com
Organisation	Community Relation Management	35.2 Implementation of an adequate community grievance mechanism								3 - Ops.: see www.ohorong-cement.com 2 - Constr: See HR Policy
	Community Relation Management	35.3 to offer job opportunities to local communities to the extent possible, if possible supported by a training programme								3 - Ops.: see www.ohorong-cement.com 2 - Constr: See HR Policy
Organisation	Community Relation Management	35.4 to identify community support measures in order to support the local license to operate								1 - Plan: See Public Relations Management 2 - Constr: Regular Communication Ongoing 3 - Ops.: see OOCCT (Ohorongpo Clav Community Trust)