











XORIS Finding Opportunities Delivering Value

Xaris Walvis Bay Power Plant and Gas Supply Facility

Environmental Management Plan Natural Gas Pipeline

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PROJECT NAME	Environmental Management Plan for the Proposed Xaris Walvis Bay Power Plant and Gas Supply Facility :Natural Gas Pipeline		
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1.1 INTRODUCTION

This Environmental Management Plan (EMP) has been drafted as part of the Environmental Impact Assessment (EIA) which was conducted in terms of the Environmental Assessment for the construction of a Natural gas pipeline as part of a larger energy provision project. Its content has been tailored according to the Regulations of the Environmental Management Act, 2007 (Act No 7 of 2007) Regulation No 30 of 2011 listing No 8(j) (aa) (bb) (cc). It aims to provide management measures to address the effects on the environment that have been identified in the EIA.

1.2 ROLES AND RESPONSIBILITIES CONCERINING THE IMPLEMENTATION OF THE EMP

The roles and responsibilities of all parties involved in effectively managing the environment are set out below:

POSITION	RESPONSIBILITY	FREQUENCY	REPORTING
Client	Accountable for all aspects of EMP compliance	Continuous	Government
Environmental Coordinator	Supervisory / Auditing EMP compliance	Monthly	Client
Contractor	Accountable for implementation of EMP	Weekly	Client
Environmental Control Officer	Responsible for implementation and monitoring	Continuous	Contractor

Table 1: Roles and responsibilities for EMP Implementation

Client

The client will take full responsibility for compliance to the EMP and will report to Department of Environmental Affairs on a continuous basis for the duration of the EMP implementation. Any incidents that may result in significant environmental degradation should be reported to the Department of Environmental Affairs immediately.

Environmental Coordinator

The Environmental Coordinator (EC) (as appointed by Xaris) will inspect the site on monthly basis to ensure that all specifications are met. The duties of the environmental coordinator will be the following:

- Audit contractor environmental policies and procedures,
- Advise the construction team in respect of implementation of the environmental specifications,
- Conduct visits to ensure all work is aligned to the EMP,
- The environmental coordinator shall inspect the site during the monthly visits. All rehabilitation results (of excavation initiatives) will be included in a quarterly report,
- Conduct inspections of the rehabilitation area and give guidance regarding rehabilitation measures where required.

The Construction Manager / Contractor

The duties of the Construction Manager (CM) or his nominated authority are as follows:

- Familiarize themselves with the requirements of the EMP,
- Develop environmental policies and procedures to comply with the EMP,
- Monitor employees' and contractors' compliance with the environmental specifications and enforce adherence,
- Maintain a record of activities relevant to environmental management,
- The construction manager shall be responsible for monitoring and the enforcement of the environmental management specifications on a day-today basis. Any violation of the environmental specifications shall be recorded and the agreed on disciplinary measures taken.

Environmental Control Officer

The Environmental Control Officer will report directly to the Construction Manager regarding the day to day implementation of the EMP as well as all reporting all environmental incidents. The following lists his/her main duties:

- Effect all environmental policies and procedures to comply with the EMP,
- Report all possible environmental incidents and rectification measures to the Construction Manager,
- Communicate all environmental related incidents with the environmental coordinator and distribute internally to avoid repeats.

1.3 ENVIRONMENTAL MANAGEMENT REQUREMENTS

The following are management actions that should be adhered to by the proponent, Xaris Energy (Pty) Ltd "Xaris" at all times. These management requirements cover all actions of the construction and operational phases. All construction and maintenance activities should be carried out in line with this Environmental Management Plan (EMP), as may be applicable to the specific phase and activities carried out.

This section of the EMP details the various management processes, from the beginning of the project to its end (operational phase), concerning the effective management of all areas. Please refer to Appendix C of the EIA for legislative and permit requirements considered during this EMP. Table 2 below is a summary of the pertinent permit and other active legal requirements needed. The EMP is laid out as follows:

- Planning and Design;
- Construction Contract Preparation Management Requirements; and
- Construction Mitigation Requirements (see Table 2 for overview);
- Permit and Legal Requirements;

Table 2: Legislation Management Requirements

THEME	LEGISLATION INSTRUMENT	MANAGEMENT REQUIREMENTS	CONTACT PERSON	
Environmental	Environmental Management Act 7	The amendment, transfer or renewal of the Environmental Clearance Certificate	Dr Freddy Sikabongo/	
	of 2007		Ms Saima	

THEME	LEGISLATION INSTRUMENT	MANAGEMENT REQUIREMENTS	CONTACT PERSON
	EIA Regulations (EIAR) GN 57/2007 (GG 3812)		Angula Tel: 061-284 2751
Labour	Labour Act 11 of 2007 Health and Safety Regulations (HSR) GN 156/1997 (GG 1617).	Adhere to all applicable provisions of the Labour Act and the Health and Safety regulations.	Labour Law Advice: Tel: 061-309 957
Water	Water Resources Management Act 13 of 2013	Water licences are required for water abstraction and use.	Elize Mbandeka Tel: 061-208 7141
Archaeology	National Heritage Act 27 of 2004	All protected heritage resources (e.g. human remains etc.) discovered, need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before they may be relocated.	Rev Salomon April Tel: (061) 244 375/ 385/594
Parks	Nature Conservation Ordinance 4 of 1975	Access permission to conduct construction and operational activities in the Dorob National Park	Manie Le Roux Tel: (061) 284 2523

1.4 PLANNING AND DESIGN PHASE

This phase contains elements that should be considered during the planning and design phase. These management requirements are important to ensure that safe management of the environment is planned for the proposed construction activities.

Table 3: Management requirements for the Planning and Design phase

ASPECT	MANAGEMENT REQUIREMENT	
EMP Implementation	Develop an effective strategy to accurately carry out the mitigation actions relevant to the construction activities in this environment.	

ASPECT	MANAGEMENT REQUIREMENT	
	Establish an applicable internal disciplinary/corrective action system for non-compliance or corrective action.	
Financial Provisions	Allocate appropriate budgetary allowances to develop proper construction planning and environmental rehabilitation actions through the compulsory development of plans and strategies to mitigate negative environmental and social impacts. Ensure sufficient insurance provisions for consequential environmental losses.	
Recruitment	If recruitment is applicable: Adhere to the legal provisions for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.) in the contract aiming for a 15% representation of women. The recruitment process must be formal and organised. Preference should be given to recruit those who live within the project area and are fit to work.	
Stakeholder Communication	Communicate planned activities with affected parties through established community communication channels.	
Health and Safety	Adhere to all legal requirements pertaining to health and safety; and consider in designs. Compile a health and safety plan (See Section B).	

1.5 CONSTRUCTION CONTRACT PREPARATION MANAGEMENT

This phase contains elements that should be considered whenever construction activities are contracted or sub-contracted to a company other than Xaris. It is further applicable to any related contract work which may be employed by Xaris. These management requirements are important to ensure that the environment is appropriately protected while construction activity takes place. Continuous rehabilitation efforts form part of the construction phase as excavated and disturbed areas are rehabilitated to ensure proper operation and maintenance of the pipeline. These activities are therefore considered as part of the construction phase.

ASPECT	MANAGEMENT REQUIREMENTS
EMP implementation	Relevant sections of this EMP should be included in the tender documents for all development so that tenderers can make provision for its implementation.
Financial provision	 Financial provision for the compilation of a Waste Management Plan should be included as a cost item within tenders concerning construction operations. Financial provision for the facilitation of an induction programme for senior and casual construction personnel as well as subcontractors and associated personnel should be included as a cost item within tenders concerning all construction activities. Financial provision for the compilation of a Vegetation Management Plan should be included as a cost item within construction tender documents. Financial provision for the drafting of a Communication Plan should be included as a cost item within construction tender documents. Financial provision for other items such as Health and Safety requirements ablutions etc. and including any other items in this EMP
Recruitment	If applicable: Provisions designed to maximise the use of local labour should be included within tenders concerning construction operations. A provision stating that all unskilled labour should be sourced from the area should be included within tenders concerning constructions operations. Specific recruitment procedures ensuring local firms enjoy preference during tender adjudication should be included within tenders concerning construction operations.
Health and Safety	Ensure construction activities are maintained within a construction

Table 4: Construction contract preparation management requirements

ASPECT	MANAGEMENT REQUIREMENTS	
	footprint to be demarcated prior to construction activities.	
	Implement health and safety plan.	

1.6 MANAGEMENT PLANS REQUIRED FOR THE PROJECT

The following management plans are required to manage the implementation of the EMP as per IFC standards, EHS Guidelines and SANS. **Table 5** below shows the relevant plans. The development of these plans and procedures must be integrated with the design process in order to align with each other.

Table 5: Management plans to align with IFC compliance

PLAN	SUB PLANS AND PROCEDURES
Emissions Monitoring and Control Plan	Monitoring and reporting procedure of emissions to keep within NOx, SO2, CO, CO2 within acceptable limits.
Noise Management Plan	Monitoring based of SANS. Noise complaints register.
Hazardous Materials Management Plan	Dangerous Goods Manifest.
Safety Management Plan	 Hazards identification and management procedures. Safety procedures and Safety Incidents Register. Permit to Work system and log. Occupational health and safety monitoring plan. Life Safety Management Plan.
Fire Response Plan	Fire Risk Identification procedures.
Security Management Plan	Security risk identification and response procedures. Response procedures within a fire risk environment.
Traffic Management Plan	Traffic communications plan.

2 CONSTRUCTION MITIGATION DETAILS

2.1 INTRODUCTION

The following table provides a large scale overview of all the major environmental management themes pertaining to both generic and site specific construction mitigation details. This table serves to act as quick reference, for the detailed mitigation details that follow below, for the implementation of the construction component of this EMP.

Theme	Objective	Mitigation Detail	
		Generic	Site-specific
Waste management	Avoid and where not possible minimise all pollution associated with construction.	Section A	Section A
Borrow pits	Ensure topsoil protection and post- construction rehabilitation.	Section B	Section B
Health and safety	Safeguard health and safety of labourers and general public.	Section C	Section C
Dust and noise	Avoid and where not possible minimise dust and noise associated with construction.	Section D	Section D
Environmental training and awareness	Awareness creation regarding the provisions of the EMP as well as importance of safeguarding environmental resources.	Section E	Section E
Environmental conservation	Minimise construction activity footprint and safeguard biodiversity in ecologically sensitive areas.	Section F	Section F
Employment/ Recruitment	Minimise negative conflict through legal and fair recruitment practices.	Section G	Section G
Stakeholder communication	Provide a platform for stakeholders to raise grievances and receive feedback and hence minimise negative conflict.	Section H	N/A
Socio-economic and Miscellaneous	Ensure due consideration is given to matters regarding the cultural and general wellbeing of the affected community and matters incidental thereto.	Section I	N/A

SECTION A: WASTE MANAGEMENT

ASPECT	MITIGATION MEASURE
	GENERIC MITIGATION MEASURES
1. Waste Management Plan	 The Contractor should compile a Waste Management Plan which should address as a minimum the mitigation measures included below. Apply the principle of reduce, re-use and re-cycle must be applied to waste generated. All bazardous waste disperal should be certified and records kept.
2. Hazardous waste	 All heavy construction vehicles and equipment on site should be provided with a drip tray and sealable transport container. Drip trays are to be transported with vehicles wherever they go. Drip trays should be cleaned daily and spillage handled, stored and disposed of as hazardous waste. All heavy construction vehicles should be maintained regularly to prevent oil leakages. Maintenance and washing of construction vehicles should be take place only at a designated workshop area. The workshop floor should be lined with concrete. The workshop should have an oil-water separator for collect run-off from washing. Spilled concrete (wet or dry) should be treated as hazardous waste and disposed of by the end of each day in the appropriate hazardous waste containers. All hazardous substances (e.g. fuel or chemicals) should be stored, according to safety regulations in a specific location on an impermeable surface which is bunded.
3. Sewage and grey water	 Do not allow the sewage (black water) to be discharged directly onto open soil. All sewage must be removed regularly and disposed of at a recognised (municipal) sewage treatment facility. The water collected from wash basins and showers / ablution facilities of the construction crew (grey water), should not be left standing for long periods of time as this promotes parasite and bacterial proliferation. Grey water should be recycled: Used for dust suppression; Used to clean equipment. If grey water will not be recycled it should be removed along with the black water on a regular basis.
4. General waste	 The construction site should be kept tidy at all times. All domestic and general construction waste produced on a daily basis should be cleaned and contained daily. No waste may be buried or burned. Waste containers (bins) should be emptied regularly and removed from site to a recognised (municipal) waste disposal site. All recyclable waste needs to be taken to the nearest recycling depot.

	4. A sufficient number of separate waste containers (bins) for hazardous and domestic/general waste must be provided on site. These should be clearly marked as such.	
	5. Construction labourers should be sensitised to dispose of waste in a responsible manner and not to litter.	
	6. No waste may remain on site after the completion of the project.	
	SPECIFIC MITIGATION MEASURES	
5. General	1. All waste should be contained immediately in closed waste containers.	
RESPONSIBILITY AND TIMEFRAME		
1.1, 4.5, 4.6	Proponent - Once off, updated quarterly.	
1.2; 1.3 2.1;	Contractor/Operator – Continuous/Daily	
2.3 - 2.6, 3.1 -		
3.4 4.1 – 4.4,		
5.1		
2.2	Contractor/Operator – Periodically as required.	

SECTION B: BORROW PITS

A borrow-pit may be required for ad-hock soil requirements associated with the concrete sleeve construction for road, waterway of related crossings.

ASPECT	MITIGATION MEASURE
GENERIC MITIGATION MEASURES	
1. Topsoil	 The Contractor should adhere to prescribed measures emanating from the borrow-pit investigation and the design for excavations and disposal of spoil material.
SPECIFIC MITIGATION MEASURES	
2. Borrow pits	1. Only existing borrow-pits (which have EMP's) in the area is to be used.
RESPONSIBILITY AND TIMEFRAME	
1.1; 2.1	Contractor - Periodically.

SECTION C: HEALTH AND SAFETY

ASPECT	MITIGATION MEASURE
	GENERIC MITIGATION MEASURES
1. HIV/AIDS and TB training	 The Contractor should approach the Ministry of Health and Social Services to co-opt a health officer to facilitate HIV/AIDS and TB education programmes periodically on site during the construction phase.
2. Road Safety	 Develop and maintain a road safety management plan Demarcate construction routes clearly. Off-road (outside the footprint area) driving should not be allowed. All vehicles that transport materials or staff to and from the site must be road worthy. Drivers that transport materials should have a valid driver's license and should adhere to all traffic rules. Loads upon vehicles should be properly secured to avoid items falling off the vehicle
3. Safety Around	 Excavations should be left open for an absolute minimum time.
Excavated and Work Areas	 Excavate as short lengths of trenches and box areas as possible for services or foundations in such a way that the trench will not be left unattended for more than 24 hours.
	 3. Demarcate the following areas with danger tape: All excavation works; Soil and other building material stockpiles; and
	 Temporary waste stockpiles Provide additional warning signage in areas of movement and in "no personnel" areas where workers are not active.
	 Work areas must be set out and isolated with danger tape on a daily basis. All building materials and equipment are to be stored only within set out
	 Only construction personnel will be allowed within these work areas. 2 fire extinguishers should be available at each fuel storage area and appliers facilities.
	 Comply with all mitigation measures laid out in Section A (Waste Management mitigation details).
4. Ablutions	 Separate ablutions (toilet and shower) should be available for men and women and should clearly be indicated as such.
	 Portable toilets (i.e. easily transportable) should be available along construction site:
	 1 toilet for every 25 females.
	 1 toilet for every 50 males.
	 Sewage waste needs to be removed on a regular basis to an approved (municipal) sewage disposal site. Alternatively, pump it into sealable containers and store it until it can be removed.
	 Workers responsible for cleaning the toilets should be provided with

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ASPECT	MITIGATION MEASURE
	latex gloves and masks.
5. Open fires	 Develop a fire and explosion prevention plan which should include as a minimum:
	- Prevention of potential ignition sources
	- Fire alarm system
	- Active Fire protection system
	- Fire response plan
	 The safety halfing No open fires may be made anywhere on site
	3 No wood may be collected within or near the project area. The Contractor
	must supply wood (or other fuel) for cooking or heating purposes.
6. General	 Appropriately rated and fitted Personal Protective Equipment should be provided for each position.
	 Dust protection masks should be provided to workers if required when working in in dusty environment
	3. Potable water should be provided to workers.
	 No person should be allowed to smoke close to any fuel storage facilities or portable toilets (if toilets are chemical toilets – the chemicals are flammable).
	5. No workers should be allowed to drink alcohol during work hours.
	6. No workers should be allowed on site if under the influence of alcohol.
	SPECIFIC MITIGATION MEASURES
7. General	 Gas pipelines and pipeline components, in addition to general installation and pipe joining techniques such as welding, should meet international standards for structural integrity and operational performance.
	2. The use of polyethylene pipe 6, which is not subject to corrosion, should be considered as an alternative to ferrous metal pipeline materials.
	3. Testing of pipelines and pipeline components for pressure specifications and presence of leaks should be undertaken prior to commissioning. The system should be gas tight when tested at a higher pressure than the normal maximum operation gas pressure
	 Pipelines, valves, and other component infrastructure should be regularly maintained, and ventilation and gas detection / alarm equipment installed in station buildings or vaults.
	 Identification and location of existing gas and other buried utility infrastructure prior to excavation for installation or repair of gas pipelines. Installation of visual marking of gaslines as part of installation, and updating as necessary on an ongoing basis.
	 Removal of sources of ignition prior to gas venting for maintenance and repair activities. Purging of gas from pipeline or pipe components prior to welding or cutting activities.
	 Installation of gas lines and components using sufficient separation distance and appropriate pipe protection layering to minimize potential interference with other underground infrastructure. Separation of plastic pipes from

ASPECT	MITIGATION MEASURE	
	sources of heat. ·	
	8. Odorization of gas to facilitate detection of gas leakage.	
8. Public	 Operators should establish an emergency preparedness (in line with IFC requirements) and response plan and communicate this plan to the public as necessary. 	
	2. Warning since of pipeline construction and operation should be erected.	
RESPONSIBILITY AND TIMEFRAME		
1.1-1.3;	Contractor - Once Off	
1.1-1.3;	Contractor/Operator - Quarterly.	
2.1-2.6; 3.1–3.2;	Contractor/Operator – Continuous/Daily	
4.1-4.6; 5.1-5.2;		
6.3-6.5; 6.8; 6.11;		
7.4; 8.2;		

SECTION D: DUST AND NOISE

ASPECT	MITIGATION MEASURE	
	GENERIC MITIGATION MEASURES	
1. Noise	 Work hours should be restricted to between 08h00 and 17h00 where construction involving the use of heavy equipment, power tools and the movement of heavy vessels is less than 1km from residential areas. PPE should include personalised hearing protection systems for all personnel 	
	that is exposed to more than the maximum allowable IFC noise level of 85dB over 8 hours or peak of 140dB instantaneous. Any hearing protection system should reduce exposure to below 85dB.	
	3. Select low noise tools and equipment and maintain as per manufacturer specification. Sound barriers and access barriers should also be put in place to reduce or restrict access to areas of high noise exposure.	
	4. Limit prolonged exposure to excessive noise and provide quiet "noise relief" areas.	
2.Vibration	1. Vibration exposure of personnel should be within the limits of appropriate vibration regulations.	
	SPECIFIC MITIGATION MEASURES	
3. Dust	1. Seawater to be used for dust suppression.	
	RESPONSIBILITY AND TIMEFRAME	
1.1-1.4; 2.1; 3.1	Contractor/Operator – Continuous/Daily	

SECTION E: ENVIRONMENTAL TRAINING AND AWARENESS

ASPECT	MITIGATION MEASURE
	GENERIC MITIGATION MEASURES
1. Environmental Induction (Training)	 All construction workers are to undergo environmental induction (training) which should include as a minimum the following: Explanation of the importance of complying with the EMP. All safety procedures, together with provision of appropriate tools and equipment; Discussion of the potential environmental impacts of construction activities. Employees' roles and responsibilities, including emergency preparedness. Explanation of the mitigation measures that must be implemented when particular work groups carry out their respective activities. Explanation of the specific mitigation measures within this EMP especially unfamiliar provisions.
	SPECIFIC MITIGATION MEASURES
2. Emergency Preparedness	 Training of gas utility workers in procedures for emergency preparedness and response involving appropriate public authorities, in addition to emergency shutdown and pressure reduction in the pipeline system.
	RESPONSIBILITY AND TIMEFRAME
1.1; 2.1	Contractor/Operator – Periodically or as required

ASPECT	MITIGATION MEASURE
	GENERIC MITIGATION MEASURES
1. Conservation Soil and groundwater	 Contaminated water (which hydrocarbons) should not be allowed to be disposed of on open soil or within excavated areas. Soil should be stockpiled for a minimum of time. Soil removed from excavated areas should be separately stored and replaced in the same sequence as removed: Topsoil and subsoil should be separated, Soil stockpiles should be kept low (1.3 ratio or less), Stockpile areas should be kept away from concrete mixing activities or any chemical processes (such as painting).
2. Materials camp and lay- down areas	 Suitable locations for the materials camp and lay-down areas should be identified with the assistance of the ER and the following should be considered in selecting these sites: The areas designated for the proposed services infrastructure should be used as far as possible, Second choice should be degraded land, Avoid sensitive areas (e.g. protected archaeological sites, rivers or drainage lines).
	SPECIFIC MITIGATION MEASURES
3. Air and Water Quality	 A leak detection and repair program should be developed and implemented. A procedure for hydrostatic testing of pipelines should be developed and implemented.
4. General	 Safety fences and other methods to prevent people or animals from falling into open trenches should be constructed in sensitive locations and within 500 m of human populations.
	RESPONSIBILITY AND TIMEFRAME
1.1; 1.2	Contractor/Operator – Continuous/Daily
1.3 4.1	Contractor/Operator – Periodically or as required.
2.1; 3.1 3.2	Proponent/Contractor/Operator – Once off

SECTION F: ENVIRONMENTAL CONSERVATION

ASPECT **MITIGATION MEASURE GENERIC MITIGATION MEASURES** 1. Legislation 1. Adhere to the legal provisions in the Labour Act for the recruitment of labour (target percentages for gender balance, optimal use of local labour and SME's, etc.) in the Contract. 2. Recruitment 1. The Contractor should compile a formal recruitment process including the following provisions as a minimum: The local authority (town council, local headman etc.) should assist with the recruitment process. Recruitment should be conducted at the site offices in a formal manner only. Set a target of employing females at 15% of the workforce. _ Ensure that all sub-contractors are aware of recommended recruitment procedures and discourage any recruitment of labour outside the agreed upon process. Contractors should give preference in terms of recruitment of subcontractors and individual labourers to those from the project area and only then look to surrounding towns. Clearly explain to all job-seekers the terms and conditions of their respective employment contract (e.g. period of employment etc.) make use of interpreters when necessary. SPECIFIC MITIGATION MEASURES 3. Skills transfer 1. Deliberate skills transfer and career development of Namibians should be implemented in scarce skills areas. **RESPONSIBILITY AND TIMEFRAME** 1.1; Contractor/Operator – Continuous/Daily Contractor/Operator - Periodically or as required. 2.1, 3.1

SECTION G: EMPLOYMENT/RECRUITMENT

ASPECT	MITIGATION MEASURE
	GENERIC MITIGATION MEASURES
1. Disclosure and Communication	1. Xaris should draft a Disclosure and Communication Plan, which should outline as a minimum the following:
plan	 How stakeholders, who require ongoing communication for the duration of the construction period, will be identified and recorded and who will manage and update these records;
	- How these stakeholders will be consulted on an ongoing basis;
	 Make provision for grievance mechanisms – i.e. how concerns can/ will be lodged/ recorded and how feedback will be delivered as well as further steps of arbitration in the event feedback is deemed unsatisfactory.
2. General communication matters	1. The Proponent should make use of a Community Liaison Officer to liaise between the Contractor, stakeholders, and Xaris. The appointed Contractor shall appoint a person from the construction team to take responsibility for the implementation for all provisions of this EMP.
	2. The Contractor shall report on the status of the implementation of all provisions of the EMP at site meetings.
	3. The Contractor should implement the environmental awareness training as stipulated in Section E.
	4. The Contractor should list the stakeholders of the project and their contact details with whom ongoing communication would be required for duration of the contract. This list, together with the Disclosure and Communication Plan should be agreed upon and given to the Contractor/Operator before construction commences.
	5. The Disclosure and Communication Plan, once agreed upon by Xaris, shall be binding.
	6. All communication with the stakeholders should take place through the Community Liaison Officer.
	7. A copy of the EMP must be available at the site office and should be accessible to all stakeholders as required.
	8. Key representatives from the above mentioned list should be invited to attend quarterly site meetings to raise any concerns and issues regarding project progress.
	 9. The Contractor should liaise with Xaris regarding all issues related to community consultation and negotiation before construction commences. 10. A procedure should be put in place to ensure that concerns raised have

SECTION H: STAKEHOLDER COMMUNICATION

	been followed-up and addressed. 11. All people on the stakeholders list should be informed about the availability of the communication plan in writing by the Proponent prior to the commencement of construction activities.	
	SPECIFIC MITIGATION MEASURES	
	No specific mitigation measures have been identified.	
RESPONSIBILITY AND TIMEFRAME		
1.1	Proponent/Contractor/Operator – Periodically or as required.	
2.2-2.3; 2.6; 2.8; 2.10;		
2.4-2.5; 2.7;	Proponent/Contractor/Operator – Continuous/daily	
2.1; 2.9; 2.11	Proponent/Contractor/Operator – Once off	

SECTION I: SOCIO-ECONOMIC AND MISCELLANEOUS

ASPECT	MITIGATION MEASURE
	GENERIC MITIGATION MEASURES
1. Archaeology	 Should a heritage site or archaeological site be uncovered or discovered during the construction phase of the project, a "chance find" procedure should be applied in the order they appear below: If operating machinery or equipment stop work; Demarcate the site with danger tape; Determine GPS position if possible; Report findings to foreman; Report findings, site location and actions taken to superintendent; Cease any works in immediate vicinity; Visit site and determine whether work can proceed without damage to findings; Determine and demarcate exclusion boundary; Site location and details to be added to the project's Geographic Information System (GIS) for field confirmation by archaeologist; Inspect site and confirm addition to project GIS; Advise the National Heritage Council (NHC) and request written permission to remove findings from work area; and Recovery, packaging and labelling of findings for transfer to National Museum. Should human remains be found, the following actions will be required: Apply the chance find procedure as described above; Schedule a field inspection with an archaeologist to confirm that remains are human; Advise and liaise with the NHC and Police; and Remains will be recovered and removed either to the National Museum or the National Forensic Laboratory.
	SPECIFIC MITIGATION MEASURES
	No Specific Mitigation measures have been identified.
	RESPONSIBILITY AND TIMEFRAME
1.1-1.2	Contractor – Periodically or as required.

3 OPERATION AND MAINTENANCE PHASE

The operational phase mitigation measures are focussed on maintenance procedures of the pipeline. No additional activities have been identified which require interventions and environmental management requirements. The mitigation measures as indicated below should be adhered to.

Table 6: Operation and maintenance phase mitigation measures

ASPECT	MITIGATION MEASURE			
EMP implementation	If any construction is to be conducted as part of maintenance works for the services infrastructure within the project area please refer to the construction mitigation measures of this EMP (Section 8).			
Pipelines operation	Regular maintenance and monitoring of the pipelines should be undertaken to detect and prevent degradation and leakage risks.			
Post-construction environmental training and awareness	All contractors appointed for maintenance work must ensure that all personnel are aware of necessary health, safety and environmental considerations applicable to their respective work.			
Closure	Should closure be considered, a closure plan and related EMP should be drafted and submitted to the DEA.			

Applicable requirements (which have been identified for the construction phase) which have bearing on the operational phase, have been referenced below in **Table 7**.

A separate Environmental and Social Management System (ESMS) should be developed for each of the life cycle phases of the project. The ESMS should cover all relevant activities by means of detailed plans and procedures.

EMP SECTION	CONSTRUCTION	OPERATIONS	MAINTENANCE	CLOSURE
A: Waste Management	1 - 5	None	1-5	1- 5
B Borrow Materials	1 - 22	NA	1 - 2	1 - 2
C: Health and Safety	1 – 8/	5.1, 5.2	1 – 6	1 - 6

Table 7: Applicable Mitigation requirements for the operational phase

EMP SECTION	CONSTRUCTION	OPERATIONS	MAINTENANCE	CLOSURE
		7.4 8	7.4, 7.6, 7.8 8	7.6 8
D: Noise, Vibration & Visual Impacts	1 - 3	1.2; 1.3; 1.4	1 – 3	1 - 3
E: Environmental Training & Awareness	1 2	1 2	1 2	1 2
F: Environmental Conservation	1 - 4	1 4	1 – 4	1 2
G: Employment / Recruitment	All	All	All	All
H: Stakeholder Communication	All	All	All	All
l: Socio- economic & Miscellaneous	1	1 NA	1	1

4 MONITORING

Continued monitoring of the implementation of the EMP should be conducted during the construction and operational phases. Specific monitoring requirements relate to any hydrotest water which may be used during any pressure testing which may be conducted before the operational phase commences. Should any such water be discharged to surface waters or land the quality thereof should meet IFC parameters as listed below:

- Total hydrocarbon content: 10 mg/L
- pH: 6 9
- BOD: 25 mg/L
- COD: 125 mg/L
- TSS: 35 mg/L
- Phenols: 0.5 mg/L
- Sulfides: 1 mg/L
- Heavy metals (total) a : 5 mg/L
- Chlorides: 600 mg/l (average), 1200 mg/L (maximum)

5 CONCLUSIONS AND RECOMMENDATIONS

No decommissioning phase has been incorporated into the EMP pipeline. Should the overall project be decommissioned, or the pipeline required to be replaced, for whatever reason, a specific Environmental Management Plan with decommissioning specific management measures will have to be drafted. This EMP has been drafted for the purposes of Environmental Clearance under Namibian law and have incorporated the following Industry specific IFC Guidelines documents:

- Environmental, Health, and Safety Guidelines for Gas Distribution Systems;
- Environmental Health, and Safety Guidelines for Onshore Oil and Gas Development.