Rössing Uranium Limited






SOCIAL AND ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED RÖSSING URANIUM DESALINATION PLANT NEAR SWAKOPMUND, NAMIBIA

NON-TECHNICAL SUMMARY

PROJECT REFERENCE NO: 110914
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PREPARED BY

aurecon
SLR

ON BEHALF OF

RioTinto
Rössing Uranium
Working for Namibia

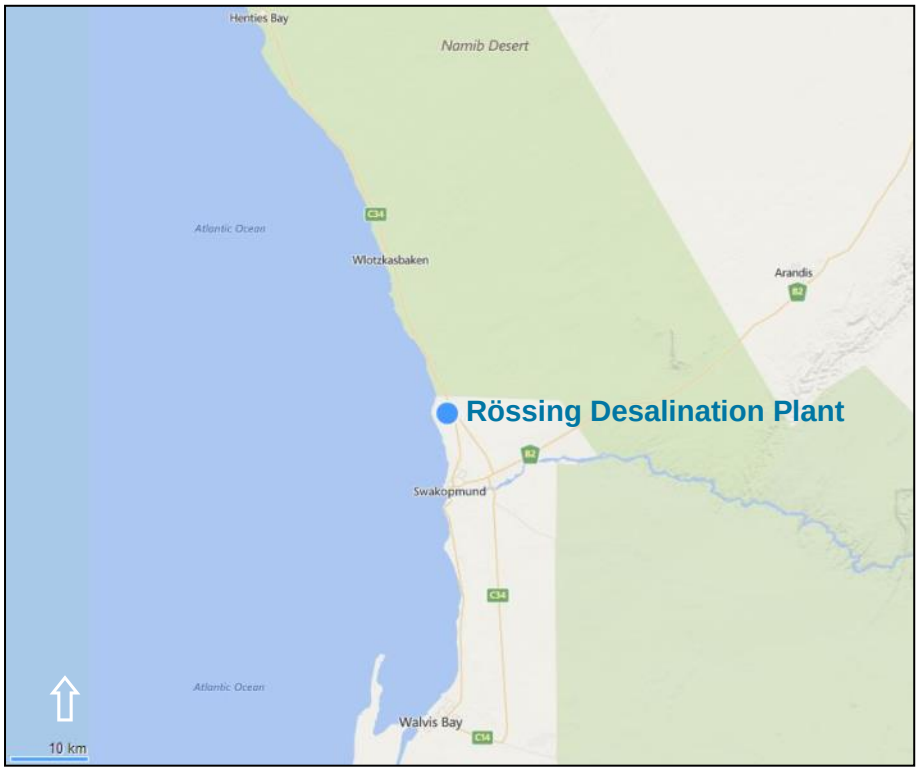
NON-TECHNICAL SUMMARY

This non-technical summary provides an overview of the draft Social and Environmental Impact Assessment (SEIA) report. The draft SEIA reports provides a description of the social and environmental baseline, and provides an assessment of the potentially significant social and environmental impacts associated with the project. The reader is referred to the draft SEIA report for greater detail on the information disclosed here.

1. General Introduction

Rio Tinto Rössing Uranium Limited (Rössing Uranium) proposes to develop a new desalination plant, approximately 6km north of Swakopmund at the existing Swakopmund Salt Works, to supply the mine's water needs. SLR Environmental Consulting (Namibia) (Pty) Limited (SLR), in association with Aurecon Namibia (Pty) Ltd (Aurecon), have been appointed to undertake the SEIA process.

Figure 1: Location of the proposed Rössing Uranium desalination plant in the regional context



Rössing Uranium is considering ways to improve the efficiency and overall economic viability of their mining operations near Arandis. The mine currently purchases water through NamWater, via the Areva Desalination Plant, which constitutes a significant overhead cost for the mine. Rössing Uranium have determined that having their own seawater desalination plant, may save costs and lead to a more efficient and resilient mining operation, especially during the current low uranium market prices. It is estimated that the cost of water from the new plant would decrease from the current average of US$4.00/m^3 to less than US$2.00/m^3 at point of supply, thus saving Rössing Uranium upwards of US$6 Million per annum (approximately N$60 million per annum).

The cost of US$2.00/m^3 to US$2.50 is widely accepted as a benchmark cost for desalinated water supply. Several years of negotiation attempts have however remained unsuccessful in bringing the current desalination supply cost down to such a level. Progress on the NamWater Mile 6 plant has also been slow and the October 2014 date for completion of that plant has not been met. This leaves the mining community exposed to the current very high desalination water costs, which is the only

alternative supply of water (other that the the supply from the Omdel aquifer), for at least the next five years.

The proposed plant will be designed to have a 10 year operational life, which ties in with the current Rössing Uranium Life of Mine plan. The plant will be designed to produce up to 10,000m^3 (10 Mℓ) of potable water in every 24 hour cycle. The plant would produce approximately 3Mm^3 per annum (or average of 8,200m^3/d), which is consistent with Rössing Uranium's water demand. At full production, the plant will abstract 25,000m^3/d of seawater; produce 10,000m^3/d of drinking water and discharge 15,000m^3/d back to the ocean as concentrated seawater or brine (containing left-over water treatment chemicals).

The project can be divided into the following main components:

- Seawater intake system;
- Seawater pre-treatment system;
- Desalination plant;
- Ancillary structures and infrastructure;
- Electrical supply system;
- Product water system and pipeline; and
- Effluent treatment and disposal system.

The plant will be designed for electrical efficiency since reverse osmosis requires significant electrical power. During the operational phase, the plant will be staffed with an estimated 12 to 18 contract staff and will be operated by Gecko Namibia (Pty) Ltd on Rössing Uranium's behalf. It should take about 18 months to build the plant, following environmental approval from the Ministry of Environment and Tourism (MET). At the end of its life, the plant may be refurbished for ongoing use, or closed, broken down and the site rehabilitated, or possibly sold to another mining operation or NamWater, depending on the needs at that time.

The aim of the SEIA process is to review the relevant legal requirements, undertake the processes as prescribed, identify and investigate potentially significant socio-economic and bio-physical impacts and provide an opportunity for the public and key stakeholders to provide input and participate in the process.

The impact assessment has considered impacts associated with:

- Project design and pre-construction impacts and considerations;
- Construction phase impacts;
- Operational phase impacts;
- Decommissioning phase impacts; and
- Cumulative impacts, taking into consideration existing pressures or impacts on the local socio-economic and biophysical environments.

for

- A Base Case (before and after proposed mitigations);
- Three project alternatives (after proposed mitigations); and
- The No-Go alternative.

Through the investigations, suitable mitigation and management measures have been proposed and carried forward into the Social and Environmental Management Plan (SEMP) which aims to guide responsible environmental management throughout the project lifecycle.

2. Project alternatives

During the scoping/pre-feasibility phase, many design options were considered, but these were reduced down and combined to form a Base Case project and feasible alternatives. The Base Case project and other feasible alternatives, together with the No-Go alternative, have been assessed in this SEIA phase. However, the Base Case project is described in detail in the SEIA Report as it was deemed the best way forward at the commencement of the impact assessment phase and assessed by all the specialists.

A number of feasible alternatives were also considered through the impact assessment. A summarised description of the various alternatives (compared to the Base Case project) with respect to each of the above mentioned project components is provided in the table below and illustrated in Figure 2.

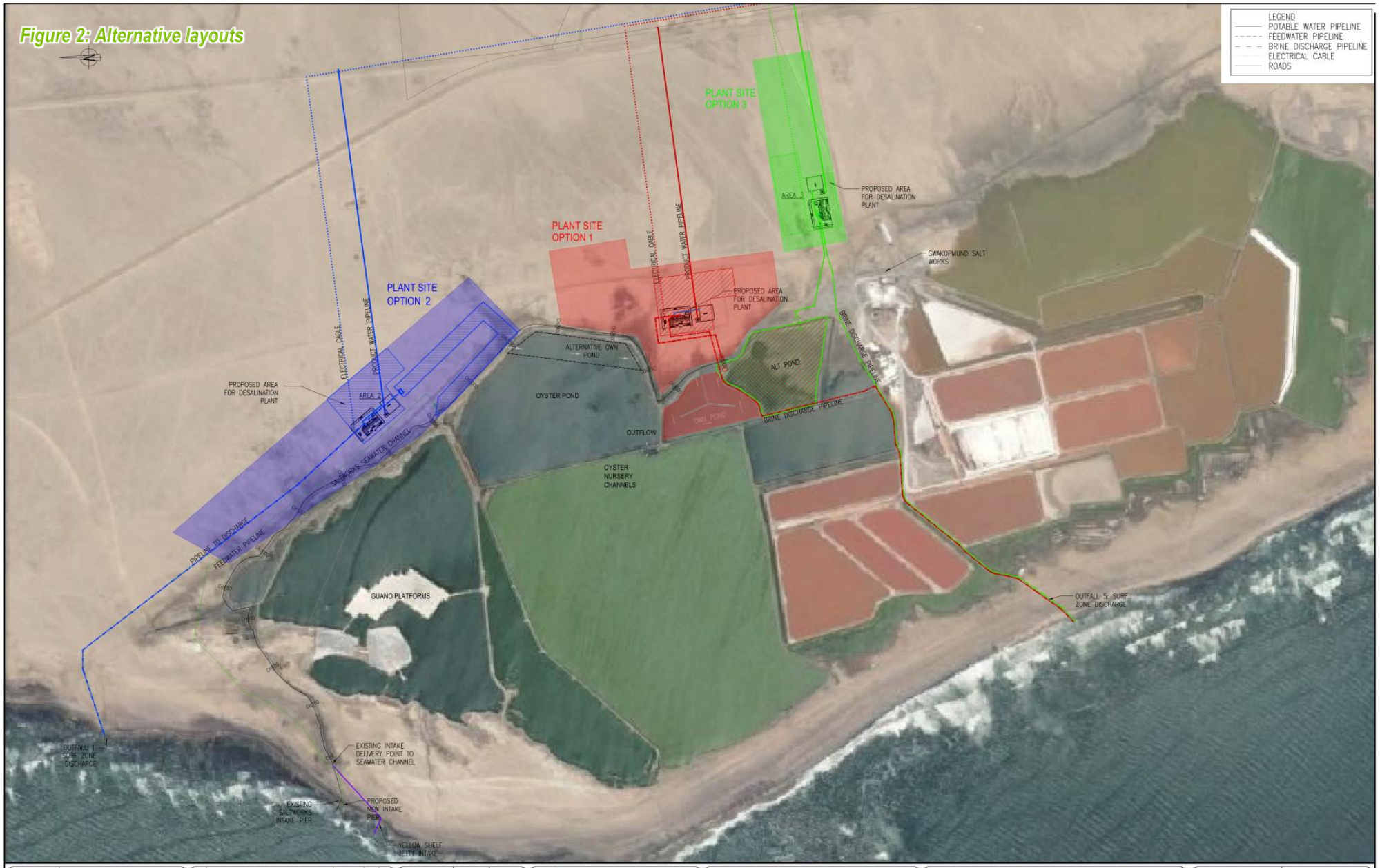
The optimised layout (i.e. SEIA recommended project layout), is described in Section 5 below and a detailed project description of this (SEIA optimised) layout is provided in the SEMP, attached to the SEIA Report as Annexure E.

Table 1: Summary of project alternatives assessed in the SEIA process

Base Case (pre-mitigation) (site 1)	Base Case (post-mitigation) (site 1)	Alternative 1 – Site 2	Alternative 2 – Site 3	Alternative 3 –with overhead power	Alternative 4 -No Go Alternative
RO Plant ~ 10,000m³/d seawater reverse osmosis (RO) plant and associated facilities situated in the centre of site locality 1. The RO plant will house the pre-treatment systems and the various pumps for the product water system. The plant will also house various ancillary facilities (chemical stores, offices, ablutions, roads, parking bays, maintenance areas, spares stores, etc.). The RO plant and associated facilities will be mostly housed within a single warehouse type structure, to protect them from the corrosive coastal air.	Same as base case alternative except that the Plant would be situated in the north / north-eastern area of location 1.	Same as base case alternative except that the Plant would be situated on site locality 2.	Same as base case alternative except that the plant would be situated in site locality 3.	Same as base case	No implementation means no direct environmental impacts. There will however be potentially significant socio-economic opportunity impacts.
Seawater intake system ~ A new seawater intake jetty and associated pumps and pipes will be erected just south of the existing Salt Works intake jetty. Seawater will enter the existing (possibly upgraded) Salt Works seawater intake channel and gravitate around the Salt Works and enter into a new seawater buffer pond located near the RO plant. A new electrical cable will be run from the RO plant around the eastern and northern shores of the salt pans, and provide power to the intake pumps on the new jetty.	Same as base case except that the new seawater intake pond would be situated closer to the RO plant on Site locality 2.	Same as base case except that the new seawater intake pond would be situated closer to the RO plant on Site locality 2.	Same as base case	Same as base case	
Pre-treatment system ~ Sea water abstracted from the buffer pond will be filtered and conditioned ahead of the desalination process. This may involve the use of pre-treatment chemicals or biological processes in combination with physical screens and filters to ensure that the water is free of particulates that could foul the RO membranes, and that the pH is optimum to allow for efficient RO process.	Same as base case	Same as base case	Same as base case	Same as base case	
Product water system ~ clear water from the RO process will then be re-mineralised to meet potable water standards and pumped via an 850m long pipeline, running due east from the plant, into the existing NamWater pipeline running along the eastern side of the Henties Bay Road (C34).	Same as base case	Same as base case	Same as base case	Same as base case	
Brine disposal system ~ Brine (together with filter backwash from the pre-treatment system and chemical cleaning processes) will be pumped from the plant via a new pipeline to ocean discharge (surf discharge) location situated south of the Salt Works bitterns outlet (southern discharge site).	Same as base case alternative except that due to RO Plant site on site 2, the northern discharge (Outfall 1) site becomes preferred due to the shorter pipe length.	Same as base case alternative except that due to RO Plant site on site 2, the northern discharge (Outfall 1) site becomes preferred due to the shorter pipe length.	Same as base case	Same as base case	
Electrical supply system ~ A buried cable would run from the existing Tamarisk substation in the northern parts of Swakopmund, along the C34 toward Henties Bay and then turn due west on a vector to connect with the	Same as base case. However the exact location where the buried cable	Same as base case. However the exact location where the buried cable	Same as base case. However the exact location	Same as base case alternative except that the distribution line	

Base Case (pre-mitigation) (site 1)	Base Case (post-mitigation) (site 1)	Alternative 1 – Site 2	Alternative 2 – Site 3	Alternative 3 –with overhead power	Alternative 4 -No Go Alternative
new mini-substation to be constructed adjacent the RO plant. The cable between the C34 and the plant should follow the same route as the product water pipeline connecting with the NamWater pipeline. Note also that a buried cable will run from the RO plant to the new seawater intake jetty.	would turn west from the Henties Bay Road is located further north.	would turn west from the Henties Bay Road is located further north.	where the buried cable would turn west from the Henties Bay Road is located further south.	from the Tamarisk substation along the C34 to Henties Bay will be above ground as opposed to a buried cable. From the C34 to the plant will remain a buried cable.	

Figure 2: Alternative layouts



3. SEIA process

Prior to the commencement of the proposed desalination project, authorisation is required on the basis of an SEIA report and SEMP. In accordance with this legal framework the SEIA approach included the following:

- The scoping process was conducted to identify the environmental issues associated with the proposed project and to define the terms of reference for the required specialist studies and the SEIA.
- Specialist studies were commissioned in accordance with the relevant terms of reference. The specialists were selected on the basis of their expertise and knowledge of the project area. (Refer to Table 3 below).
- The SEIA report and SEMP was prepared on the basis of the findings of the specialist studies.
- A project specific public participation process was conducted. As part of this process the regulatory authorities and interested and affected parties (IAPs) were given the opportunity to attend information sharing meetings, submit questions and comments to the environmental team, and review the background information document, scoping report and now the SEIA report and SEMP. All questions and comments that were raised by the authorities and IAPs have been included and answered in the Comments and Reponse Report, attached to the SEIA Report as Annexure C9.

The following specialist studies were identified in the scoping phase and undertaken during the SEIA phase. These studies have assisted with the investigation and assessment of the key impacts, as well as providing recommendations to reduce and manage those impacts as best as possible:

Table 2: Specislist studies cnducted as part of the assessment phase of the SEIA

SPECIALIST FIELD	SPECIALIST	DESCRIPTION
Socio-economic	Ms. Auriol Ashby (Social) (Ashby Associates CC) and Dr Jonathan Barnes (Economic) (Design and Development Services cc)	Identify and assess the potential Socio-economic impacts associated with the construction and operation of the proposed Rössing Uranium desalination plant.
Heritage and Archaeology	Dr John Kinahan (Quaternary Research Services)	This study will focus on the probable impacts of the proposed project on heritage and archaeological impacts within the footprint of the proposed project.
Visual	Stephen Stead (Visual Resource Management Africa)	Assess the potential visual impact caused by the proposed Rössing Uranium desalination plant.
Noise	Nicolette von Reiche (Airshed Planning Professionals)	Identify and assess the potential noise impacts associated with the construction and operation of the proposed Rössing Uranium desalination plant.
Avifauna	Mike and Ann Scott (African Conservation Services CC)	Identify and assess the potential impacts on local birdlife associated with the construction and operations of the proposed Rössing Uranium desalination plant and associated infrastructure (most notably a possible overhead powerline).
Marine ecology	Dr Andrea Pulfrich (Pisces Environmental Services (Pty) Ltd)	Identify and assess the potential impacts to marine and coastal ecology associated with the construction and operation of the proposed Rössing Uranium desalination plant. The study will rely on the marine discharge and modelling study to be undertaken by WSP.
Brine diffusion modelling	Christoph Soltau (WSP Group)	Assess the marine discharge options and undertake a hydrodynamic modelling exercise to determine the likely movement and dissipation of the discharge plume. Note that this is not an impact assessment but informs the marine ecology impact assessment.
Shoreline dynamics	Christoph Soltau (WSP Group)	Identify and assess the potential impacts that may arise as a result of the construction and operation of the desalination plant's seawater intake, brine outfall and associated structures located on the beach or in the surf on natural coastal processes.

4. Social and environmental impact assessment findings

Through the cause of the SEIA process it came to light that the Base Case project layout was situated in a Damara Tern (breeding endemic seabird, globally Near Threatened and also Near Threatened in Namibia) core breeding area and that the desalination plant would need to move.

With input from the bird specialist, the other specialists identified above, the technical team and Rössing Uranium, various other project layouts (as described in section 2 above) were developed and assessed as part of the SEIA process to come up with an SEIA optimised layout.

The following table provides a summary of the impact assessment results. This table only shows the post mitigation impact significance ratings.

The following (colour) legend is applicable to the significant ratings in the tables:

Legend	High (-)	Medium (-)	Low (-)	Very low (-)	Neutral	Very low (+)	Low (+)	Medium (+)	High (+)

Table 3: Post-mitigation impact significance ratings summary

Aspect	Phase	Impact Description	Base Case - Post-mitigation	Alternative 1 - Plant site 2	Alternative 2 - Plant site 3	Alternative 3 – Overhead powerline	Alternative 4 - No go
Socio-economic	Construction	Increased traffic and road safety risks.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Reduction in Guano production as a result of disturbance of birds.	Very low (-)	Low (-)	Very low (-)	Very low (-)	Neutral
	Operations	Economic viability of Rössing Uranium Mine.	High (+)	High (+)	High (+)	High (+)	High (-)
		Financial implications for other water users and NamWater.	Medium (-)	Medium (-)	Medium (-)	Medium (-)	Medium (-)
		Financial implications On Langer Heindrich Uranium / Husab.	Low (-)	Low (-)	Low (-)	Low (-)	Low (-)
		Water availability in the region.	High (+)	High (+)	High (+)	High (+)	Low (+)
		Disruptions may result in a lower Guano production rates.	Very low (-)	Low (-)	Very low (-)	Very low (-)	Neutral
	Decommissioning	Bulk water supply options associated with decommissioning.	High (+)	High (+)	High (+)	High (+)	Neutral
Archaeology and heritage	Construction	Loss or damage of archaeological and heritage resources.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
	Operations	No operational phase impacts.	Neutral	Neutral	Neutral	Neutral	Neutral
	Decommissioning	No decommissioning phase impacts.	Neutral	Neutral	Neutral	Neutral	Neutral
Visual impacts	Construction	Intake jetty during construction.	Medium (-)	Medium (-)	Medium (-)	Medium (-)	Neutral
		RO Plant during construction.	Low (-)	Low (-)	Medium (-)	Medium (-)	Neutral
	Operations	Impact of the RO plant and all associated infrastructure.	Low (-)	Medium (-)	Medium (-)	Medium (-)	Neutral
	Decommissioning	Visual impact associated with the decommissioning phase of the project.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
Noise impacts	Construction	Construction noise impact on birds.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Construction noise impact on humans.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
	Operations	Operations phase noise impact on birds.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Operations phase noise impact on humans.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
	Decommissioning	Decommissioning phase noise impact on birds.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Decommissioning phase noise impact on humans.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
Avifauna impacts	Construction	Destruction/modification of Damara Tern breeding habitat.	Low (-)	Very low (-)	Low (-)	Low (-)	Neutral
		Destruction/modification of habitat of other birds.	Low (-)	Low (-)	Low (-)	Low (-)	Neutral
		Physical disturbance to breeding birds, especially Damara Terns.	Low (-)	Very low (-)	Low (-)	Low (-)	Neutral
	Operations	Physical disturbance to breeding birds, especially Damara Terns.	Low (-)	Very low (-)	Low (-)	Low (-)	Neutral
		Physical disturbance to roosting/breeding cormorants.	Very low (-)	Low (-)	Very low (-)	Very low (-)	Neutral
		Collision of birds with power line structures.	Neutral	Neutral	Neutral	Medium (-)	Neutral
		Bird electrocutions on power supply structures.	Neutral	Neutral	Neutral	Medium (-)	Neutral
	Decommissioning	Physical disturbance to breeding birds, especially Damara Terns.	Low (-)	Very low (-)	Low (-)	Low (-)	Neutral
Marine ecology impacts	Construction	Disturbance and destruction of marine biota through alteration and disruption of the coastal zone during construction.	Low(-)	Low(-)	Low(-)	Low(-)	Neutral
		Detrimental effects on marine biota through accidental hydrocarbon spills, concrete works and litter in the coastal zone during construction.	Low(-)	Low(-)	Low(-)	Low(-)	Neutral
		Reduced physiological functioning of marine organisms due to increased turbidity of nearshore waters during excavations.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Smothering of benthos through re-deposition of suspended sediments.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral

Aspect	Phase	Impact Description	Base Case - Post-mitigation	Alternative 1 - Plant site 2	Alternative 2 - Plant site 3	Alternative 3 – Overhead powerline	Alternative 4 - No go
		Disturbance of shore birds and marine biota through construction noise.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Disturbance and injury of shore birds and marine biota through blasting.	Low (-)	Low (-)	Low (-)	Low (-)	Neutral
		Elimination of benthic communities through loss of substratum in structural footprint.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
	Operations	Loss of marine species through impingement and entrainment.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Potential flow distortion around the discharge outlet.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Reduced physiological functioning of marine organisms due to elevated salinity.	Low (-)	Low (-)	Low (-)	Low (-)	Neutral
		Avoidance behaviour by invertebrates, fish and marine mammals of the discharge area.	Low (-)	Low (-)	Low (-)	Low (-)	Neutral
		Reduced physiological functioning of marine organisms due to elevated temperature.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Reduced physiological functioning of marine organisms due to reduced dissolved oxygen concentrations.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Detrimental effects on marine organisms due to residual chlorine levels in the mixing zone.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Chronic effects on marine organisms due to formation of halogenated by-products.	Low (-)	Low (-)	Low (-)	Low (-)	Neutral
		Reduction in dissolved oxygen concentrations as a result of dechlorination.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Excessive bacterial re-growth in the brine after chlorination.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Detrimental effects on marine organisms through discharge of co-pollutants in backwash waters.	Low (-)	Low (-)	Low (-)	Low (-)	Neutral
		Detrimental effects on marine organisms through discharge of antiscalants in backwash waters.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Detrimental effects on marine organisms or ambient seawater pH through discharge of residual cleaning solutions used periodically for cleaning in place.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Detrimental effects on marine organisms of heavy metals from corrosion processes.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
	Decommissioning	Impacts to marine ecology associated with decommissioning activities.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
Shoreline dynamics impacts	Construction	Intake Jetty: Disruption of coastal processes by marine works.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Intake Jetty: Alteration of beach composition with rock spoil.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Brine outfall: Disruption of coastal processes by marine works.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Brine outfall: Alteration of beach composition with rock spoil.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Brine outfall: Earthworks related flooding or beach erosion.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
	Operations	Intake Jetty: The coastal processes (waves, currents, sediment transport) are affected by the jetty structure.	Low (-)	Low (-)	Low (-)	Low (-)	Neutral
		Intake Jetty: Natural sand movement is impacted by the jetty abutment to shore.	Neutral	Neutral	Neutral	Neutral	Neutral
		Intake Jetty: Wind-blown sand pathways are impacted by the intake structure and pipelines.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral
		Brine outfall: The outfall pipeline causing updrift accretion and downdrift erosion of the beach.	Low (-)	Low (-)	Low (-)	Low (-)	Neutral
		Brine outfall: wind-blown sand pathways on the upper beach are impacted by the brine outfall pipeline.	Neutral	Neutral	Neutral	Neutral	Neutral
		Brine outfall: The high velocity flow from the outfall causes scouring of the sandy seabed.	Low (-)	Low (-)	Low (-)	Low (-)	Neutral
	Decommissioning	Impacts to shoreline dynamics during decommissioning would be comparable with those experienced during the construction phase.	Very low (-)	Very low (-)	Very low (-)	Very low (-)	Neutral

5. Opinions and recommendations

In the interest of economic feasibility, Rössing Uranium decided to pursuing its own source of desalinated water. Given the current poor uranium market, it is essential that Rössing Uranium implement measures to remain viable and in so doing, avoid the potentially significant regional socio-economic impacts that could arise as a result of its premature closure.

In the Environmental Assessment Practitioner's (EAP's) opinion three key sensitive aspects were identified during the impact assessment process. The first relates to the projects potential impacts on

bird life in the area, given that the Mile 4 Salt Works is a recognised Important Bird Area (IBA) and an important breeding area for the Damara Terns (breeding endemic seabird, globally Near Threatened and also Near Threatened in Namibia). The second relates to the potential impacts on marine ecology as a result of the desalination process. The third relates to the potentially significant negative socio-economic impacts if the project does not go ahead and the Rössing mine is forced to close prematurely. Although visual impacts were rated as a medium negative impact because of the nature of the area being unobstructed, we don't consider this to form one of the key aspects to be considered in making a decision.

Regarding the bird aspect, special attention has been given to the issue and was pivotal in the project team having to investigate various site locations for the desalination plant and finally informing the development of the SEIA optimised layout, which is dealt with in the key recommendations to follow, and which seeks to mitigate the impact significance to birdlife. It is believed that the operation of the RO plant will have an acceptable level of impact to resident birdlife (given the recommended mitigations) however special care will need to be taken through the construction phase of the project to limit the disruption of the local bird assemblages and avoid disturbances to the Damara Terns during their annual breeding period.

Regarding marine ecology, and from a broader viewpoint, the marine ecology impacts associated with the operational phase were found to be within acceptable tolerances. As a result of this, the operational phase marine impacts associated with brine disposal need not factor significantly into the taking of the decision.

The socio-economic impacts associated with the No-Go alternative and assuming Rössing closes prematurely as a result translates into a significant socio-economic impact for the region that should be avoided, especially now, during a period of depressed uranium market prices.

Other impacts, including noise, visual, and heritage are all within acceptable tolerances.

The EAP is of the opinion (subject to the implementation of the recommendations and mitigations measures identified, most notably the key recommendations that follow) that not only could the project go ahead on the basis of the potential environmental impacts, but should go ahead on the basis of the potentially significant socio-economic impacts associated with not going ahead (if an alternative agreement between relevant parties cannot be reached timeously).

- **Key Recommendation 1: SEIA Optimised Layout:** The SEIA assessed three potential site locations (areas) for the RO plant, i.e. site areas (options) 1, 2 and 3 Base Case. Through the assessment, supported by the relevant specialist and technical studies, an optimised project layout has taken shape which is believed to be a healthy comprise between the technical, financial, and environmental aspects. This layout sees the RO plant shift to the far north or north-eastern corner of site area 1 (away from the core Damara Tern breeding area) but not as far as site option 2, where the RO plant could impact more significantly on the residents of the correctional services accommodation (noise and visual impacts) and tourists (visual impacts) or the birds on the guano platform. Additionally, to use the northern brine discharge point, associated with the above mentioned plant location, as this would take the pipeline away from the Salt Works inter-pond service road network (resulting in less disruption to the Salt Works during construction) and the Damara Tern breeding area but would also see the discharge making use of the derelict concrete Salt Works intake structure, which could reduce the construction phase impact for the brine discharge. The optimised project layout is shown in
- Figure 103 at the end of this subsection. All the alternatives except the base case (unmitigated) could be approved by MET, subject to the implementation of all the commitments in the SEMP.

- **Key Recommendation 2: Earthen Berm Enclosure:** This key recommendation is closely linked to the foregoing SEIA optimised layout recommendation. It emerged during the course of the various specialist studies that enclosing the RO plant with a 1.8m to 2m high earthen berm serve a number of impact mitigation functions, as follows:
  - Visual impacts: an earthen berm would act as a visual screen and reduce the visual impacts associated with ground level activities and movements around the plant. The earth berm would also lessen the vertical prominence of the plant when viewed from a distance (provided that the earthen berm ties in with the surrounds). At night the berm would reduce the spillage of light into the adjoining areas, mitigating light pollution related impacts.
  - Noise impacts: an earthen berm would serve as an acoustic barrier and mitigate noise pollution generated at or near ground level and delinking noises from specific movements or activities (i.e. if you can see the bulldozer, the noise seems more intrusive to the receptor.)
  - Avifauna impacts: by reducing the noise and visual disturbances associated with the movement of people, plant and vehicles and associated activities around the RO plant, the potential impact to resident birdlife, most notably the Damara Terms (with their core breeding area located in the area adjacent the SEIA optimised layout) can be maintained within acceptable levels and is expected to have the following benefits:
    - Delinking noises from sudden visible movements, which could otherwise spook birds;
    - Reducing the overall noise level from the plant that could disturb nesting/roosting birds; and
    - Preventing low level light spillage from the RO plant or vehicle headlights around the plant, which would otherwise cause birds to cast a long shadow, increasing their visibility and susceptibility to would be predators.

- **Key Recommendation 3: ProGreen™ Technology**: The ProGreen™ technology is a new approach to desalination in southern Africa. As such the project is approaching the use of technology with precaution and has opted to retain a tried and tested pre-treatment process (i.e. dissolved air floatation (DAF)) and upon which the impact significance rating in the SEIA are based. In the event however that ProGreen™ does perform to full specification and full implementation is realised (i.e. all feedwater is treated to 100% by the ProGreen™ bio-flocculation technology), then this could reduce the potential impacts to marine ecology associated with the co-discharge of various water treatment, conditioning and cleaning chemicals, normally associated with a dissolved air floatation system. In the best case scenario, these impacts would reduce to zero or “Neutral”. Note that the ProGreen™ would still produce a sludge that would be co-discharged with the brine effluent arising from the Reverse Osmosis process. The use of this technology is encouraging for the desalination industry and, if proven effective, could have far reaching cumulative environmental benefits for future desalination plants across the subcontinent. Rössing Uranium may even be in a position to investigate the option to discharge the brine into the Salt Works evaporation ponds, which could further reduce the operation phase impacts associated with brine discharge on the marine environment.

6. Way forward

On completion of the public comment period, the SEIA Report and SEMP will be finalised, taking cognisance of further comments received by I&APs. The reports will by updated where relevant and the finalised reports will then be submitted to MET:DEA for their review and decision whether the proposed desalination project can be implemented or not from an environmental point of view.

All comments received on the Draft SEIA Report and SEMP, together with the environmental team’s responses, will be included in the Comments and Response Report which will be submitted to MET.

Figure 3: SEIA optimised Layout