

ENVIRONMENTAL IMPACT ASSESSMENT

Updated Final Environmental Impact Assessment Report for the
Proposed Construction, Operation and Decommissioning of a
Seawater Reverse Osmosis Plant and Associated
Infrastructure in Tongaat, Kwazulu-Natal

UPDATED
FINAL
EIA
REPORT

APPENDIX F:

Coastal Water Discharge
Permit Application



**GENERIC APPLICATION FORM FOR A COASTAL WATERS DISCHARGE PERMIT
IN TERMS OF SECTION 69 OF THE INTEGRATED COASTAL MANAGEMENT (ICM) ACT, (ACT
NO. 24 OF 2008) effective from 01 January 2014**

GENERAL INSTRUCTIONS

- i. All relevant sections of this Application Form **must** be completed in full.
- ii. If an item is “not applicable”, please indicate “N/A”. The use of “not applicable” in the Application Form must be done with circumspection.
- iii. Failure to fully complete all required parts of this application form or pay necessary Application Fees (if required) will result in the application being returned.
- iv. This Application Form **must** be completed and signed by the applicant. If the application is completed by a third party (such as a consultant or legal representative), the third party’s details must further be included.
- v. All details of previous approved licenses such as the reference number (s) and the dates of issue as well as expiration dates must be provided.
- vi. This Application Form is current as of 1 January 2014. It is the responsibility of the Applicant to ascertain whether subsequent versions of the Application Form have been published or produced by the Department. Note that this Application Form replaces all the previous versions. This updated Application Form must be used.
- vii. One hard copy and one electronic copy (CD/DVD/ via E-mail) of this form must be submitted.
- viii. The required information must be typed within the spaces provided. The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided. The space provided extend as each space is filled with typing. A legible font type and size must be used when completing the form. The font size should not be smaller than 10pt (e.g. Arial Narrow). A digital copy of the Application Form is available on request.
- ix. **No faxed or e-mailed applications will be accepted.**
- x. Unless protected by law, all information contained in and attached to this Application Form will become public information on receipt by the Department. Upon request, any Interested and Affected Party should be provided with the information contained in and attached to this Application Form.

- xi. This Application Form must be submitted to the Department at the postal or physical address given below. Unnecessary delays will be incurred should the application and attached information not be submitted to the correct address.
- xii. This Application Form, with all applicable documents **must** be addressed and sent to the Department of Environmental Affairs: Branch Oceans and Coasts to the **Director: Coastal Pollution Management** to:
 - 2nd Floor, East Pier Building, East Pier Road, V & A Waterfront, Cape Town *or*
 - P.O. Box 52126, V & A Waterfront, 8002

Electronic submissions may also be sent to: cwdp@environment.gov.za
- xiii. The proof of payment of the application fee must be attached to this application.
- xiv. A copy of this application must be kept for the applicant's record.
- xv. The Department's "Draft Generic Assessment Criteria" must be consulted for guidance on how the generic assessment criteria will be used to evaluate your application.
- xvi. The Department's "***Guideline on public participation requirements for Coastal Waters Discharge Permit Application under section 69 of the National Environmental Management Act: Integrated Coastal Management Act 2008 (Act no.24 of 2008)***" must be consulted for guidance when conducting public participation for a CWDP.
- xvii. For information or enquiries, please contact the following officials:
 - Mr M. Tshikotshi on 021 819 2455 or via E-mail mtshikot@environment.gov.za
 - Ms N. Baijnath-Pillay on 021 819 2409 or via E-mail nbpillay@environment.gov.za

SPECIFIC INSTRUCTIONS

Who must apply for a Coastal Waters Discharge Permit (CWDP)?

Anyone who discharges or intends to discharge land-derived effluent into the coastal waters of South Africa must apply for a CWDP.

Section 69 (1) of the ICM Act states:

“No person may discharge effluent that originates from a source on land into coastal waters except in terms of a general authorisation ... or a coastal waters discharge permit ...”

Under the ICM Act, **“effluent”** is defined as:

- (a) Any liquid discharged into the coastal environment as waste, and includes any substance dissolved or suspended in the liquid; or*
- (b) Liquid which is a different temperature from the body of water into which it is being discharged.*

“Waste” is similarly defined in the ICM Act as:

“... any substance, whether or not that substance can be re-used, recycled or recovered –

- (i) that is surplus, unwanted, rejected, discharged, abandoned or disposed of;*
- (ii) that the generator has no further use of, for the purposes of production, reprocessing or consumption;*
- and*
- (iii) that is discharged or deposited in a manner that may detrimentally impact on the environment.”*

Sections A, B, and C

- I. Section A: To be completed by a private entity.
- II. Section B: To be completed by a consultant and acting on behalf of the applicant.
- III. Section C: To be completed by organ of state or operating as a parastatal.

- Complete all relevant fields.
- If you are a private individual and have been contracted as a service provider for the purposes of environmental authorisations and monitoring, please complete sections A and B respectively.
- If you are representing an organ of state/government/parastatal and have contracted a service provider for the purposes of environmental authorisations and monitoring, please complete sections B and C respectively.

Application Information

- i. Existing discharge: New Application: Renewal Application:
 Revision/Amendment of Existing CWDP Permit:
- ii. Discharge into which of the following receiving environments:
 Offshore: Surf Zone: Estuary:

(For estuary discharges, applications will be processed in consultation with the relevant Department of Water Affairs Office)

SECTION A APPLICANT INFORMATION (PRIVATE)

Company trading name (if any):
 Registration no:
 Contact person:
 Physical address:
 Postal address:
 Postal code:
 Telephone:
 E-mail:
 Website:

	Cell: _____
	Fax: _____

If the applicant is an individual please provide South African identification number or alternatively provide a valid Passport Number: _____

Pipeline owner:
 Contact person:
 Postal address:
 Postal code:
 Telephone:
 E-mail:

	Cell: _____
	Fax: _____

NB: If another company also discharges via this outfall, kindly attach a list of details as requested in all sections of this application form for any such company.

SECTION B APPLICANT INFORMATION (CONSULTANT)

Consultancy
 Trading Name:
 Registration no:
 Consultant's name:
 Designation:
 Physical address:
 Postal code:
 Telephone:
 E-mail:
 Website:

Council for Scientific and Industrial Research (CSIR)		
Not Applicable – The CSIR is a parastatal.		
Annick Walsdorff		
Principal Environmental Assessment Practitioner		
11 Jan Celliers Street, Stellenbosch		
7600	Cell:	083 390 9009
021 888 2661/2589	Fax:	021 888 2693
awalsdorff@csir.co.za		
www.csir.co.za/ems		

SECTION C**APPLICANT INFORMATION (ORGAN OF STATE OR PARASTAL)**

1. Name of District or Local Authority:
Umgeni Water
2. Department: Engineering and Scientific Services
3. Directorate/Section: Water Quality and Environment

4. Primary Contact Official:

Name & Surname:	Phumi Ndlovu		
Designation/Rank:	Environmental Scientist		
Physical address:	310 Burger Street, Pietermaritzburg 3201		
Postal code:	031 268 7172	Cell:	083 581 1904
Telephone:	Phumi.Ndlovu@umgeni.co.za	Fax:	033 341 1349
E-mail:	www.umgeni.co.za		
Website:			

5. Secondary Contact official:

Name & Surname:	Kevin Meier		
Designation/Rank:	Manager: Planning Services		
Physical address:	310 Burger Street, Pietermaritzburg 3201		
Postal code:	033 341 1281	Cell:	
Telephone:	Kevin.Meier@umgeni.co.za	Fax:	033 341 1218
E-mail:	www.umgeni.co.za		
Website:			

SECTION D**EFFLUENT GENERATION**

1. Provide a brief description of the effluent discharge process that results in the effluent being generated, together with the products, by-products and other waste per month. Attach an effluent flow chart.

The proposed project will entail the construction and operation of a 150Ml/day Seawater Reverse Osmosis (SWRO) desalination plant at Tongaat, north of Durban, within the eThekweni Municipality in the province of KwaZulu-Natal. The Project Applicant is Umgeni Water Amanzi (hereinafter referred to as Umgeni Water). The proposed project requires a Scoping and Environmental Impact Assessment (EIA) in terms of the 2010 NEMA EIA Regulations (as amended). The location for the proposed SWRO has been selected based on pre-feasibility and site screening studies. The proposed site for the desalination plant is located within 200 m of the ocean shore. Currently, the land at the proposed site is used mainly for market gardening and residence (including 3 – 5 permanent houses, which would need to be demolished as a result of the proposed project). Reverse Osmosis (RO) is a membrane filtration process used to reduce the salinity of seawater to potable standards. The process works by applying pressure to overcome the natural osmotic pressure of seawater. This works by forcing pre-treated

(filtered) seawater through a semi-permeable membrane, from a region of high salinity (the seawater side) to a region of low salinity (the freshwater side). This process retains the brine (high salinity) on one side and allows freshwater (very low salinity) to be produced as potable water for drinking. The overall output of the SWRO system, from intake structure to finished water, will be a maximum of 40 - 45% desalinated water (i.e. 55-60% of the seawater abstracted will be returned to the sea as brine). Concentrate will exit the RO system at pressure ranging from 0.4 to 0.6 bars, assuming that a pressure exchanger type energy recovery system is used.

An area of approximately 1 ha is required for construction and lay-down of the offshore pipework/tunnels, which will be reinstated.

The proposed project will entail the construction of the following key infrastructural components:

- **Seawater Intake:** On average, 389 Ml/day of seawater will be abstracted from the marine environment via an intake structure located approximately 650 m from the shore at a water depth of about 20 m. Water will be drawn in through coarse screens on the intake structure, at a height of between 4 m and 6 m above the seabed, in order to avoid the intake of marine sediment and floating matter. A low inflow velocity of less than 0.15 m/s will reduce the intake of small fish and other marine organisms. Seawater passing through the intake structure will be transported to the proposed desalination plant via a 220 m long seawater intake pipeline laid on the seabed and a 680 m tunnel which will be excavated in rock under the surf zone and under the beach, the coastal forest and the M4 highway to the pump station. Refer to the explanation below regarding the routing of the seawater pipelines.
- **Seawater Pump Station:** A seawater pump station is proposed within the footprint of the desalination plant. It is anticipated that the excavation for the invert of the pump station sump is likely to be at 11 m below Mean Sea Level (MSL). This is based on the requirement that the sump at the pump station be deep enough to allow for gravitational inflow of the seawater into the sump..
- **SWRO Desalination Plant:** The EIA is assessing the siting of the desalination plant at a proposed site located approximately 200 m from the shore. The footprint area of the proposed desalination plant itself and associated infrastructure would be about 7 ha.
- **Brine Discharge Pipeline and Diffuser System:** From the pump station, the brine discharge pipeline will be tunnelled under the M4 highway, the coastal forest and the beach, to a diffuser sited approximately 350 m from the shore at a water depth of approximately 10 to 12 m. The brine discharge pipelines will be shorter than the seawater intake pipelines to ensure adequate dilutions are obtained and to avoid short-circuiting of higher salinity concentrations at the intake system. Brine will be discharged via a number of outlet ports in the diffuser. The diffuser pipeline on the sea bed will extend approximately 60 m in length. Rosette-style diffusers and pipeline-style diffusers (which consist of nozzles) could possibly be utilised. These pipelines will discharge the dense brine upwards into the water column to provide good mixing with the ambient seawater. The "plume" of higher salinity would be distributed in an along-shore direction (i.e. the prevailing current direction), as well as seaward. Refer to the detailed explanation below.
- **Potable Water Pipelines:** The integration of the proposed desalination plant requires construction of three potable water pipelines. The first potable water pipeline will lead from the desalination plant in a north-west direction to the La Mercy Reservoir. From there, a second potable water pipeline will continue north-westwards from the La Mercy Reservoir to the Hazelmere Bifurcation pipeline

(Tying into the Hazelmere Bifurcation pipeline would allow for water to be delivered to both the north and to the south by reversing the flow in the bifurcation pipeline). The third pipeline will extend from the La Mercy Reservoir in a south-west direction following the direction of the N2 National Road before turning westwards and coming to an end at the Waterloo Reservoir. The potable water pipelines will be developed with a capacity of 150 Ml/day.

Potable Water Pipeline	Length
Tongaat Desalination Plant to La Mercy Reservoir	1.67 km
La Mercy Reservoir to Hazelmere Bifurcation Pipeline	2.66 km
La Mercy Reservoir to Waterloo Reservoir	11.40 km
TOTAL	15.73 km

- **Power Supply Infrastructure:** The proposed SWRO desalination plant is anticipated to have a total energy demand of approximately 32 MW (i.e. approximately 4 kWh/m³ of potable water produced, while additional power will be required to pump water to the plant from the sea and to deliver potable water to the bulk supply infrastructure). It is expected that the total electrical connection to the 150 Ml/day plant would be approximately 40 Megavolt Amperes (MVA).

Specifically in terms of the effluent generation and discharge process, the proposed desalination plant would have facilities for the collection and environmentally safe disposal of waste streams generated during the water treatment. The proposed plant would generate the following waste streams:

- Concentrate from the RO desalination process (i.e. brine from the proposed SWRO process, which will be discharged to the sea);
- Spent backwash water from the pre-treatment filtration system which will be combined with the brine for discharge at sea;
- Filter-to-waste water which will be combined with the brine for discharge at sea;
- RO and spent (used) membrane cleaning solutions and post-flush water which will be combined with the brine for discharge at sea;
- Sludge liquid (and associated solid) wastes and other water treatment units, which is intended for co-discharge with the return brine; and
- Sanitary wastewater (i.e. on-site sewage which is proposed to be treated on-site in a septic tank or package plant system or directed to the local sewer for further treatment in the nearby municipal wastewater treatment plant).

Spent filter backwash water, filter-to-waste water, sludge from lime saturators and spent RO membrane cleaning water would be collected in a discharge retention tank fitted with mechanical mixers or recirculation pumps to keep its content uniformly mixed at all times. This tank will have a retention time of about 1 hour and would also be equipped with feed lines for sodium hydroxide, hydrochloric acid and sodium bisulphite to adjust the water quality in the tank in order to meet the specified discharge requirements. The retention tank would have at least two compartments to facilitate periodic cleaning. Alternatively, two separate discharge retention tanks could be constructed: one dedicated to the pre-filtration waste stream (spent filter backwash water, and lime sludge), and another tank for separate handling of the RO membrane cleaning chemicals and flush water. These liquid waste streams would then be mixed with the RO plant concentrate (brine) and discharged to the ocean through the offshore outfall. The total volume of all liquid waste streams generated by the proposed desalination plant (excluding the RO brine concentrate) is estimated to be approximately 10% of the total plant intake flow (i.e. 38.9 to 42.8 Ml/day). More than 99% of this volume will be seawater (same quality as the

abstracted seawater) and will be disposed of with the brine whilst the balance would have small amounts of chemicals in it.

As mentioned above, approximately 55-60% of the seawater intake will return to sea as brine. The total volume of effluent expected to be discharged at sea therefore amounts to 239 Ml/day on average. The brine will be approximately 1.6 times the salinity of seawater (i.e. approximately 58 psu) and will be approximately 1.5 °C above the average background temperature of seawater. The brine will also contain small amounts of coagulants, neutralised antiscalant, cleaning chemicals and other metals (depending on intake water quality). The antiscalants (returned as part of the brine to the sea) will be bio-degradable. The brine may also contain an organic scale inhibitor which will be an approved chemical for potable water systems and will be bio-degradable.

Furthermore, it is likely that the use of a biocide will be required to inhibit biological growth in the pipelines and on the intake coarse screens. If sodium hypochlorite is used, it will be neutralised with sodium metabisulphite (SMBS) before the feed water enters the RO membranes as the chlorine damages the membranes. The brine stream is therefore not anticipated to contain any active biocide.

Brine is negatively buoyant and will generally sink towards the seabed. To ensure optimum dilution in the near-field, it is envisaged that the nozzle would be configured to discharge at an angle of 60° above horizontal, at a depth of approximately 10 to 20 m below MSL. The brine will be dispersed in ambient seawater in a moving current and at a rate which will depend on the diffuser design and the current velocity.

Between 20 and 100 kg/month of screening material, e.g. large algae retained by the screens, from the fine screens installed at the intake pump station on shore will be collected and disposed of at an appropriate waste landfill facility approximately twice per month. Such screenings are of natural origin and they are biodegradable and can be disposed to a general waste landfill facility.

An effluent flow chart is attached to this Coastal Waters Discharge Permit (CWDP) as Appendix A.

2. Describe the location of the waste generation points as within the facility, the route to the coast, the discharge point and the structures associated with the activity en route to the discharge point.

Refer to the explanation provided in Section D.1 above which provides details of the overall proposed project and the waste generation processes within the proposed desalination plant, the proposed route of the brine discharge pipeline, the brine discharge point, as well as the structures associated with the activity en route to the discharge point. Refer to Figure 1 below which shows the overall proposed layout of the desalination plant, including the brine discharge pipeline and outfall.

The proposed desalination plant outfall would be capable of discharging the entire volume of the source water collected by the intake system, i.e. a maximum of 428 Ml/day. The sea outfall conduit would consist of a High Density Poly Ethylene (HDPE) pipeline (outside diameter of 1 600 mm) and diffusers, and would be designed to maintain a flow velocity of 0.7 m/s or more in order to prevent the formation of deposits and scale on the inner surface of the pipe/tunnel. The overall expected discharge velocity noted in the feasibility report is 3 to 4 m/s, which would allow almost complete dissipation of the plant concentrate into the ambient seawater within a short distance from the diffusers. The discharge outfall

conduit would be sized to convey the entire maximum design concentrate and spent pre-treatment filter backwash volume.

The outfall pipeline will be laid in a common trench together with the seawater intake pipelines. The outfall pipeline will be tunnelled from the pump station, under the beach and surf zone to a distance of approximately 350 m from the shore. Seaward of this point the pipeline would lie on the sandy seabed. Pre-cast concrete weight collars with a submerged weight of 7.2 tonnes would be used to secure the pipeline in position. The brine outfall pipe will terminate in a multi-port diffuser located approximately 410 m from the shore in 10 m to 12 m water depth. Sea bed conditions (rocky in nature) beyond the surf zone at the Tongaat site are conducive to tunnelling the outfall pipe. Numerical modelling was undertaken of both the near-field dilution of the brine as it exits the diffuser ports, and the far-field dispersion of the brine. For the latter, a three-dimensional hydrodynamic model was set up of the Tongaat region. The model was calibrated against site measurements, including 12 months of current measurements in 17 m water depth. The measurements showed current speeds average 0.09 m/s, with a maximum of 0.46 m/s. The modelling showed that under most conditions brine concentrations are reduced to below 1 ppt above ambient salinity within 30 to 50 m from the diffuser.

The diffuser pipeline will extend approximately 60 m in length and will be manufactured of corrosion- and crush-resistant material. As noted above, the outfall pipe will terminate with a multiport diffuser which would be designed so that the end of the transport pipe is capped and the last sections of the pipe contain lines of small ports (openings or diffuser nozzles). The purpose of the diffuser would be to provide a greater initial dilution of the concentrate as it enters the surface water.

The diffuser system design incorporates the following key features:

- The design diffuser exit velocity is in a range of 2 to 4 m/s;
- The diffuser system would be placed perpendicular to the prevailing ocean current;
- The distance between ports would be selected such their individual discharge plumes do not overlap;
- As noted above, diffusers would be located at an angle of 60° from the horizontal pipe;
- The size of the ports would be increased gradually towards the end of the pipe to maintain sufficient flow in each diffuser;
- The total cross-sectional area of the diffuser ports would be less than about 70% of the cross-section of the outfall pipe; and
- Diffuser ports would have a diameter of 200 mm to prevent blockage.

As noted above, detailed numerical modelling and engineering design was undertaken by the appointed consulting engineers as part of the feasibility stage. The relevant findings of the feasibility report have been included in the Project Description Section of the Draft EIA Report.



Figure 1: Overall Proposed Layout of the Desalination Plant and Associated Marine Infrastructure at Tongaat.

It is important to note that a detailed “Desalination Options and Feasibility Report” was compiled by the appointed consulting engineers in June 2015 as part of the Feasibility Phase.

Tongaat Intake

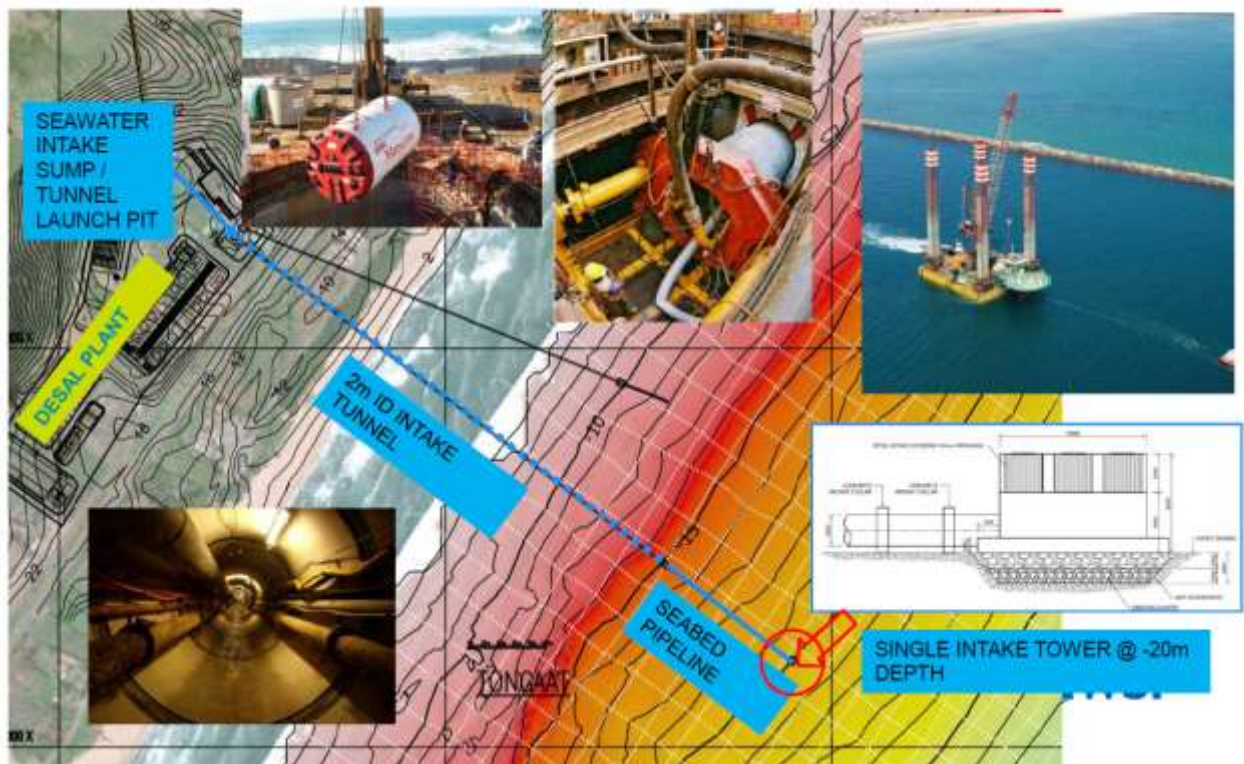


Figure 2: Proposed Layout of Intake and Outfall for the Desalination Plant and Associated Infrastructure at Tongaat.

3. In order to further assess the application, please indicate the type of sector generating the effluent. (Make an X in the appropriate box)

a. Aquaculture	
b. Industrial	
c. Brine or brackish water from desalination	X
d. Cooling water	
e. Fish processing effluent	
f. Municipal Effluent	
g. Hydrostatic pressure testing of tanks and pipes	
h. Canellised Agricultural runoff	
i. Stormwater from industrial facilities	
j. Other (please specify below)	

NB: For municipal effluent proposed for coastal discharge, an evaluation in terms of the Water Services Development Plan, in terms of the Water Services Act (Act No. 108 of 1997), must be submitted with regard to water management for the Municipality

SECTION E

ALTERNATIVES AND RATIONALE FOR THE DISCHARGE OF EFFLUENT

1. Do alternatives exist other than to discharge the effluent into the coastal environment?

	NO
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2. If alternatives to discharge exist, please provide details:

[Redacted area]

3. If not, provide a strong motivation for the need and desirability of the effluent discharge into the coastal environment, noting the need to consider the best practicable environmental option for the site:

Refer to the information provided in Sections D.1 and D.2 above regarding the need for the disposal of desalination plant discharge into the coastal environment. Furthermore, given that all data and feasibility studies thus far have indicated that water demand will exceed supply in the near future and the desalination of seawater is the most feasible and viable alternative supply source (also considering that all private and commercial activities are strongly dependent on water in the region), there can be little doubt that the desalination plant proposed for the Tongaat region is the best practicable environmental option for this site.

Discharge of the generated brine via a seawater outfall is the most feasible option of waste disposal, based on the proximity of the site to the ocean.

Furthermore, as noted above, it is important to note that the waste disposal to sea is simply that which was taken out of the sea together with the screenings and sludge from the filtration process. This consists of the naturally occurring constituents of the sea, such as clay, sand, and microscopic marine biota such as algae. Normally the filtration and lime treatment sludge is combined to produce a neutral pH sludge that can easily be disposed of. Furthermore after blending, the desalination plant discharge will meet all pertinent regulatory requirements associated with disposal of effluent to the sea.

4. Provide details of measures that are/will be made for effluent avoidance/prevention, waste minimisation, recycling, etc.

Refer to the information provided in Sections D.1 and D.2 of the CWDP application for the type of waste to be generated by the plant.

The brine stream has a high residual energy content which is utilised through the introduction of Energy Recovery Devices to reduce the overall energy requirement of the plant. As mentioned previously the concentrations of waste are minimal when compared with the overall brine discharge volume. Measures of safe disposal are described below.

As part of the Feasibility Study (Aurecon, June 2015), various options were assessed and discussed in terms of the waste stream handling activities. The following options were assessed as part of the report for waste stream handling:

- Discharge Retention Tank;
- Solids Treatment and Disposal; and
- Discharge via outfall.

The option of solid waste treatment and disposal is not feasible as it will entail that all liquid waste discharges, except for the sanitary wastewater and concentrate from the SWRO system, would be conveyed to a solids handling system for further treatment. Therefore, the preferred waste stream alternative recommended and therefore assessed as part of the EIA (i.e. for full-scale project implementation) is the disposal of all desalination plant waste streams, after their equalization and neutralization in the discharge retention tank, and subsequent blending with the desalination plant concentrate. The implementation of this alternative will eliminate the generation of sludge and associated solids waste disposal to a landfill, while providing low-cost environmentally safe disposal of the desalination plant waste streams. Furthermore, based on the analyses of the specific conditions at the Tongaat desalination plant site, the recommendations included within the Feasibility Report state that the plant discharge facilities should include:

- A discharge retention tank; and
- An offshore outfall.

The Environmental Management Programme (which forms part of the EIA Report) includes recommendations for waste minimisation and recycling, where possible. For the small amount of solid waste that would be generated during the operational phase, it is recommended that it be transferred and disposed of at a licenced waste disposal facility on a frequent basis (such as once or twice per month).

5. Has any of the activities in the Listing Notices of the Environmental Impact Assessment Regulations (2010), in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), been triggered that will result in the discharge to the coastal environment? YES X

6. If YES, has the abovementioned assessment been conducted? YES X

NOTE: that a public participation process is required before a CWDP may be authorised. If the answer to question 6 is "NO," please be informed that the CWDP Reference Number as well as the associated documentation pertaining to this application may be used in the public participation process for an Environmental Authorisation to avoid duplication of such a process.

Note from the CSIR: The proposed project requires a Scoping and EIA Process to be undertaken in terms of the 2010 NEMA EIA Regulations (as amended), as a result of the applicability of certain listed activities in Government Notice (GN) R544, R545 and R546 to the proposed project. In particular, Listed Activity 5 (amongst others) of GN R545 is triggered as a result of the permit required for the discharge of effluent to the coastal environment (i.e. a CWDP in terms of the National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) (NEMICMA)). The Project Applicant

(Umgeni Water) has appointed the CSIR to carry out the requisite Scoping and EIA Process. **The Scoping and EIA Process is currently underway.** An Application for Environmental Authorisation was submitted and lodged with the Competent Authority (the National Department of Environmental Affairs (DEA)) on 12 December 2013. The DEA accepted the Application for Environmental Authorisation in March 2014 and the following reference number has been allocated to the application (DEA Reference: 14/12/16/3/3/2/652). The following progress has been made in terms of the Scoping and EIA Process:

- Letter 1 (dated 17 March 2014) was sent to registered Interested and Affected Parties (I&APs) notifying them of the initiation of the Scoping Process and providing them with a Background Information Document (BID) to inform them about the project and a comment form. A comment and registration period extending from 17 March 2014 to 17 April 2014 was provided.
- Newspaper Advertisements were placed on 19 March 2014 in The Mercury and Isolezwe in order to inform I&APs of the commencement of the Scoping Process and to invite I&APs to register their interest in the project and raise issues of concern.
- Site notice boards (isiZulu and English) have been placed at the proposed project site and all location alternatives.
- Letter 2 (dated 10 September 2014) was sent to registered I&APs notifying them of the availability of the Draft Scoping Report (DSR) for comment and inviting them to attend a public meeting. The public meeting was held on 7 October 2014. The DSR was made available for a 40-day comment period extending from 10 September 2014 to 21 October 2014.
- Advertisements were placed on 10 September 2014 in The Mercury and Isolezwe announcing the commenting period on the DSR.
- The DSR was distributed on 10 September 2014 (Letter 2), whereby hard copies were placed at local libraries and on the project website (i.e. www.csir.co.za/EIA) for viewing by I&APs. Electronic copies and/or hard copies were also provided to key I&APs and organs of state.
- Public Meetings were held on 8 October 2014 (at the Tongaat Town Hall) and 9 March 2015 (at the AFM Church (KZN Celebration Centre) – Letter 3), where representatives of the Project Applicant and the EIA Project Team were present to interact and engage with members of the public and to discuss the proposed project and to obtain comments and concerns from I&APs.
- Advertisements were placed on 24-27 February 2015 in six newspapers announcing the extension of the commenting period on the DSR. Advertisements were placed in The Mercury, Isolezwe, Coastal Weekly, Makhulu News, Northern Star and North Coast Courier.
- Site notice boards (isiZulu and English) have been placed at the proposed project site and three additional key community areas.
- Project information and reports that are available for comment are regularly placed on the project website.

The Final Scoping Report was submitted to the National DEA for decision-making in May 2015, and was also made available to all I&APs for a 21-day comment period. Letter 4 (dated 15 May 2015) was sent to all registered I&APs to inform them of the availability of the Final Scoping Report on the project website (www.csir.co.za/EIA) and at the Tongaat Beach Library. The Final Scoping Report was accepted by the National DEA on 17 June 2015.

Following acceptance of the Final Scoping Report and Plan of Study for EIA (17 June 2015), the EIA Phase has commenced and the Draft EIA Report compiled (inclusive of specialist studies and specialist input). The Draft EIA Report was released to I&APs for a 40-day comment period on 21 March 2016. Newspaper adverts were placed and a letter sent (Letter 5) to inform I&APs of the availability of the Draft EIA Report and the public meeting. A public meeting was held during the 40-day comment period (on 13 April 2016) in order to present the findings of the EIA Phase and specialist studies. During the public meeting, I&APs were also reminded of the submission of a CWDP to the DEA: Branch Oceans and Coasts for the proposed project. Any issues raised regarding the CWDP were noted by the project team.

Once the 40-day comment period was completed, the comments raised by I&APs were collated and compiled into a Comments and Responses Trail. The Final EIA Report was prepared and submitted to the DEA for decision-making in terms of whether to grant or refuse Environmental Authorisation. The Final EIA Report is also be made available to I&APs for a concurrent 21-day comment period (Letter 6). Registered I&APs were notified of the submission of the Final EIA Report via Letter 6 and the report was placed on the project website.

Letter 7 will be sent to all registered I&APs to inform them of the environmental decision and the associated appeal process.

7. Environmental Authorisation Reference Number (if YES):

The DEA EIA Reference Number allocated to the Application is 14/12/16/3/3/2/652. The Scoping and EIA Process is still currently underway and an Environmental Authorisation (should such authorisation be granted) is pending. Please refer to the explanation provided in Section E.6 above.

(Attach approved Environmental Authorisation)

8. Date of commencement of pipeline operation

To be confirmed (subject to the granting of an Environmental Authorisation in terms of the NEMA EIA Regulations and the completion of the detailed engineering).

9. Is an Environmental Authorisation in progress?

YES X

Note from the CSIR: Please refer to the explanation provided in Section E.6 above.

SECTION F

PUBLIC PARTICIPATION PROCESS

NOTE: No Public Participation may commence without a CWDP reference number issued by the Department, where clarity will be given on the extent of the public participation required.

NOTE: The Applicant must take into account the Department's **"Guideline on public participation requirements for Coastal Waters Discharge Permit Application under section 69 of the National Environmental Management Act: Integrated Coastal Management Act 2008 (Act no.24 of 2008)"** when conducting public participation for a CWDP.

Note from the CSIR: Refer to Section E.6 above regarding the EIA Process and the Public Participation Process undertaken. The table below shows the requirements for minimum Public Participation information in terms of the CWDP as noted in the abovementioned DEA's Guideline.

DEA Public Participation Guideline for CWDP	Applicability to the EIA Process
3.1 A local newspaper advertisement, inviting public comment on the application;	<ul style="list-style-type: none"> • Newspaper Advertisements were placed on 19 March 2014 in The Mercury and Isolezwe in order to inform I&APs of the commencement of the Scoping Process and to invite I&APs to register their interest in the project and raise issues of concern. Site notice boards have been placed at various locations along the proposed project. • Advertisements were also placed on 10 September 2014 in The Mercury and Isolezwe announcing the commenting period on the DSR. • Advertisements were also placed on 24-27 February 2015 in six newspapers announcing the extension of the commenting period on the DSR. • Advertisements were placed in six newspapers upon release of the Draft EIA Report during week of 20-25 March 2016. • Advertisements will be placed upon receipt of the Environmental Authorisation (should such authorisation be granted by the DEA).
3.2 A site notice must be placed at the entrance of the site and all alternative sites inviting all I&APs to comment on the application;	<ul style="list-style-type: none"> • Site notice boards (isiZulu and English) have been placed at the proposed project site and three additional key community areas (i.e. La Mercy Beach Hotel, and Seabelle Restaurant, Tongaat Beach Library). • Additional site notices have been placed along the proposed powerline.
3.3 Request comment on the application from the members of any forum or committee that engages in discussions around the effluent and the coastal outfall pipeline, if applicable;	<ul style="list-style-type: none"> • This is on-going throughout the EIA Process. The eThekweni Municipality and the Department of Water and Sanitation have been included on the project database. The municipality has commented on the BID DSR, and FSR to date.
3.4 Request comment on the application from all state departments who administer laws relating to any matter affecting the coastal environment;	<ul style="list-style-type: none"> • This is on-going throughout the EIA Process. The Coastal and Biodiversity Unit of the KZN Department of Economic Development, Tourism and Environmental Affairs (KZN DEDTEA), as well as the National DEA: Branch Oceans and Coasts have been included on the

DEA Public Participation Guideline for CWDP	Applicability to the EIA Process
	project database.
3.5 Landowners who have property and occupiers of land within a 100m radius of the site must be identified and given an opportunity to comment on the application;	<ul style="list-style-type: none"> This is on-going throughout the EIA Process. Landowners and adjacent landowners have been informed of the proposed project and have been included on the I&AP database. They will continue to be informed of the EIA Process and availability of reports for comment.
3.6 Comment from the relevant local Municipality must be requested;	<ul style="list-style-type: none"> This is on-going throughout the EIA Process. The eThekweni Municipality has been included on the project database and have commented on the BID and DSR to date.
3.7 No Public Participation may commence without a CWDP reference number issued by the Department.	DEA Ocean and Coast to supply a reference number

The table below shows the requirements for minimum Public Participation information in terms of the CWDP for EIA Processes as noted in the abovementioned DEA's Guideline.

DEA Public Participation Guideline for CWDP	Applicability to the EIA Process
5.1. Where both a CWDP and an Environmental Authorisation (EA) are required, a CWDP application must be submitted simultaneously with the EIA application (for both Basic Assessment and Scoping / EIA processes) and the Department must be registered as an I&AP in the EIA process;	<ul style="list-style-type: none"> The National DEA: Branch Oceans and Coasts have been included on the project database since the outset of the process. The Application for a CWDP (i.e. this document) has been submitted to the National DEA Branch Oceans and Coasts.
5.2 The Department will issue the applicant with a reference number which must be used during the Public Participation Process for the EIA;	<ul style="list-style-type: none"> When available, the reference number from the National DEA: Branch Oceans and Coasts will be used during the remainder of the EIA Public Participation Process.
5.3 The Public Participation Process prescribed for the CWDP application process listed above can be substituted with the Public Participation Process of the EIA;	<ul style="list-style-type: none"> Refer to the table above, which indicates that the Public Participation Process that has been undertaken to date, and will continue to be undertaken as part of the EIA Process, complies with the requirements of the Public Participation Process (PPP) prescribed for the CWDP Application Process. Therefore, it is proposed that the CWDP PPP is substituted for the EIA PPP.
5.4 The Department will notify the applicant / or EAP of the requirements relating to the CWDP application during the EIA Public Participation Process and will only make a decision on the CWDP application once the EIA process (including the appeals process) has been finalised; and	<ul style="list-style-type: none"> The National DEA: Branch Oceans and Coasts (i.e. Ms. Natisha Baijnath-Pillay) has informed the EAP of the requirements relating to the CWDP application during the EIA PPP. A meeting was held with the National DEA: Branch Oceans and Coasts on 9 June 2015.
5.5 Once the EIA process has been finalised, the applicant / or EAP must submit the final Basic Assessment / Environmental Impact Report with	<ul style="list-style-type: none"> A copy of the Final EIA Report will be submitted to the National DEA: Branch Oceans and Coasts accordingly for decision-making.

DEA Public Participation Guideline for CWDP	Applicability to the EIA Process
its appendices, a copy of the Environmental Authorisation and a copy of all documents relating the appeals process (if any) to the Department.	<ul style="list-style-type: none"> A copy of the Environmental Authorisation (should one be granted) will also be sent to the National DEA: Branch Oceans and Coasts.
5.6 The evaluation of and the issuing of a decision on the CWDP application will be concluded once the EIA decision is finalised.	<ul style="list-style-type: none"> This is noted.

SECTION G SITE CHARACTERISATION

1. It is required by the applicant to attach to this application:
 - 1.1. A detailed site map and aerial photograph indicating the following:
 - i. Point(s) of discharge
 - ii. Location where effluent is generated on land
 - iii. Effluent monitoring points
 - iv. An indication of whether any diffusers have been connected to the pipeline.

A detailed site map and aerial photograph is included in Appendix B.

- 1.2. The total length of the pipeline (from the high water mark to the point of discharge): The total length of the pipeline from the high water mark to the point of discharge is 350 m (Refer to the explanations provided in Section D of this CWDP Application).
- 1.3. The shortest straight line distance from the high water mark to the discharge point: The shortest straight line distance of the pipeline from the high water mark to the point of discharge is 350 m.
- 1.4. The depth of the discharge point (i.e. the depth at the end of the pipeline): 10 m to 12 m depth below MSL.
- 1.5. The Erf No: Properties affected by the proposed marine pipeline (from the pump station to the discharge point)

Portion 17 of Erf 662	Tongaat	N0FU03350000066200017
Portion 6 of Erf 662	Tongaat	N0FU03350000066200006
Portion 34 of Erf 662	Tongaat	N0FU03350000066200034
Rem of Erf 662	Tongaat	N0FU03350000066200000
Portion 3 of Erf 662	Tongaat	N0FU03350000066200003
Portion 41 of Erf 662	Tongaat	N0FU03350000066200041
Portion 42 of Erf 662	Tongaat	N0FU03350000066200042
Portion 14 of Erf 662	Tongaat	N0FU03350000066200014

Refer to Appendix D for corresponding map
 (Attach relevant supporting documents to this application form)

2. Complete the following mandatory fields:
 (Use either Decimal Degrees or Degrees Minutes and Seconds)

2.1. Co-ordinates for point/s of discharge (end of pipeline in coastal environment):

Point – End Point of Discharge	29° 37' 27.60" S and 31° 09' 11.52" E
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2.2. The GPS co-ordinates of the point where the coastal outfall pipeline crosses the high water mark:

Point – Centre Point of pipeline (Note that this will be tunnelled below the surf zone and will therefore not cross the high water mark itself.	29° 37' 24.95"S and 31° 08' 56.87"E
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2.3. Co-ordinates for plant/generator of land derived effluent (terrestrial):

Point	Refer to the Section below for the co-ordinates of the corner points of the proposed desalination plant.
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Point	Location	LAT (d:m:s)	LONG (d:m:s)
1	Desalination Plant Footprint Area	S29° 37' 30.24"	E31° 08' 44.33"
2	Desalination Plant Footprint Area	S29° 37' 35.48"	E31° 08' 40.55"
3	Desalination Plant Footprint Area	S29° 37' 33.00"	E31° 08' 36.54"
4	Desalination Plant Footprint Area	S29° 37' 29.25"	E31° 08' 39.65"
5	Desalination Plant Footprint Area	S29° 37' 26.27"	E31° 08' 41.35"
6	Desalination Plant Footprint Area	S29° 37' 22.92"	E31° 08' 42.05"
7	Desalination Plant Footprint Area	S29° 37' 20.41"	E31° 08' 43.65"
8	Desalination Plant Footprint Area	S29° 37' 19.63"	E31° 08' 47.22"
9	Desalination Plant Footprint Area	S29° 37' 23.42"	E31° 08' 50.75"
10	Start of Brine Discharge Tunnel	S29° 37' 23.78"	E31° 08' 50.43"

11	Mid Point of Brine Discharge Tunnel	S29° 37' 24.95"	E31° 08' 56.87"
12	End of Brine Discharge Tunnel	S29° 37' 27.60"	E31° 09' 11.52"
13	End of Sea Water Intake Tunnel	S29° 37' 24.49"	E31° 08' 49.74"
14	Mid Point of Sea Water Intake Tunnel	S29° 37' 31.06"	E31° 08' 59.84"
15	Start of Sea Water Intake Tunnel	S29° 37' 41.91"	E31° 09' 16.54"



SECTION H**EFFLUENT CHARACTERISATION**

1. Complete the following information (refer to the Annex for guidance on completing this section):

Note: The scenarios of Max and Average are based on Maximum and average TDS in the sea water intake samples respectively. TDS measurements have been extracted from a 12 month record of water sea quality sampling at the proposed intake location at Tongaat. It is important to note that it would be incorrect to model a scenario when every constituent is at its maximum concentration, as this will never occur and we would therefore be creating an artificial and unrealistic sample. As such, TDS was used as the parameter to determine the MAX and AVG condition, and have modelled the concentrations in the sea water of all other parameters occurring at the same time (i.e. in those two samples).

Quality Variable and unit of measurement	Average Discharge Concentration per month	Maximum Anticipated Discharge Concentration per month
Coliforms (Colony Forming Units/ml)	139.9303	Data not available
Enteric pathogens e.g. E.coli (Colony Forming Units/ml)	Data not available	Data not available
pH (pH units)	8.21	8.21
Temperature (°C)	22	22
Acidity (mg/l) - CaCO ₃	399	-
Alkalinity (mg/l) - CaCO ₃	397	395
Aluminium (ug/l)	133.20	Data not available
Ammonia (mg/l) – NH ₄	0	0
Arsenic (ug/l)	7.2	Data not available
Barium (mg/l)	0	7
Boron (mg/l)	6.00	6.50
Bromide (mg/l)	160.2	117.0
Cadmium (ug/l)	0.18	Data not available
Calcium (mg/l)	695	708
Chemical oxygen demand (mg/l)	Data not available	Data not available
Chloride (mg/l)	33555.20	36917.00

Quality Variable and unit of measurement	Average Discharge Concentration per month	Maximum Anticipated Discharge Concentration per month
Chromium (ug/l)	0	Data not available
Chromium(vi) (mg/l)	Data not available	Data not available
Cobalt (mg/l)	Data not available	Data not available
Copper (ug/l)	27.0	Data not available
Cyanide (mg/l)	<0.09	<0.09
Fluoride (mg/l)	2.10	2.20
Iron (ug/l)	165.60	Data not available
Lead (ug/l)	3.6	1.8
Lithium (mg/l)	Data not available	Data not available
Manganese (ug/l)	30.60	Data not available
Mercury (ug/l)	3.6	Data not available
Molybdenum (µg/l)	17.1327	Data not available
Nickel (ug/l)	0	1.8
Phenol (mg/l)	<0.99	<0.99
Potassium (mg/l)	660.70	721.90
Radionuclides (mg/l)	Data not available	Data not available
Salinity (psu)	63.1431	63.7200
Soap, oil or grease (mg/l)	<0.7920	Data not available
Sodium (mg/l)	18397	19742
Sulphate (mg/l) – SO ₄	4754.10	5058.00
Tin (µg/l)	<9.9	<9.9
Total dissolved solids (mg/l)	60672	65702

Quality Variable and unit of measurement	Average Discharge Concentration per month	Maximum Anticipated Discharge Concentration per month
Total Suspended solids (mg/l)	0	0
Total nitrogen (mg/l) = NO ₃	0	0
Total phosphorus (mg/l)	0.6030	Data not available
Uranium (mg/l)	Data not available	Data not available
Vanadium (mg/l)	Data not available	Data not available
Zinc (ug/l)	28.8	Data not available

2. Complete the following Monthly discharge pattern (in volume) below and indicate the unit of measurement thereof:

Month	Average					Maximum				
January	7	4	0	9		8	1	5	3	
February	6	9	3	1		7	6	2	7	
March	7	4	0	9		8	1	5	3	
April	7	1	7	0		7	8	9	0	
May	7	4	0	9		8	1	5	3	
June	7	1	7	0		7	8	9	0	
July	7	4	0	9		8	1	5	3	
August	7	4	0	9		8	1	5	3	
September	7	1	7	0		7	8	9	0	
October	7	4	0	9		8	1	5	3	
November	7	1	7	0		7	8	9	0	
December	7	4	0	9		8	1	5	3	
Total/annum	8	7	4	7	4	9	6	2	5	8

In cubic meters

OR

% of total

OR

Another unit of measurement (please specify)

_____ MI _____

3. Provide a description of any treatment processes applied to the effluent, where applicable.

Spent filter backwash water, filter-to-waste water, sludge from lime saturators and spent RO membrane cleaning water would be collected in a discharge retention tank fitted with mechanical mixers or recirculation pumps to keep its content uniformly mixed at all times. This tank will have a retention time of about 1 hour and would also be equipped with feed lines for sodium hydroxide,

hydrochloric acid and sodium bisulphite to adjust the water quality in the tank in order to meet the specified discharge requirements. The retention tank would have at least two compartments to facilitate periodic cleaning. Alternatively, two separate discharge retention tanks could be constructed: one dedicated to the pre-filtration waste stream (spent filter backwash water, and lime sludge), and another tank for separate handling of the RO membrane cleaning chemicals and flush water. These liquid waste streams would then be mixed with the RO plant concentrate (brine) and discharged to the ocean through the offshore outfall. The total volume of all liquid waste streams generated by the proposed desalination plant (excluding the RO concentrate) is estimated to be approximately 10% of the total plant intake flow (i.e. 38.9 to 42.8 Ml/day). More than 99% of this volume will be seawater (same quality as the abstracted seawater) and will be disposed of with the brine whilst the balance would have small amounts of chemicals in it. As mentioned above, approximately 55-60% of the seawater intake will return to sea as brine. The total volume of effluent expected to be discharged at sea therefore amounts to 239 Ml/day on average.

SECTION I COMPLIANCE MONITORING AND REPORTING

1. Provide a description of all monitoring points along the effluent stream.

Monitoring of water quality throughout the proposed plant will be conducted using both on-line instrumentation and grab sampling with laboratory analysis. In general, the provision will be made for sampling of every process stream before and after every process change. On-line analytical instruments will be installed in strategic locations to monitor the process and to monitor environmental parameters, i.e. before the brine is discharged into the closed pipeline for disposal. On-line instruments will typically be mounted on wet racks within a building. A common sampling point may service several analytical instruments, monitoring the required water parameters for the particular process stream.

A manual sampling valve will be located adjacent to every sampling point to enable verification of the continuous on-line sampling and analysis by manual sampling and laboratory analysis.

The quality of seawater into and discharge of effluent from the proposed desalination plant will be continuously monitored by on-line instrumentation including:

- pH;
- Conductivity;
- Turbidity;
- Oxidation reduction potential (as a surrogate for oxidising biocides); and
- Temperature.

The marine ecology specialist study has also recommended to undertake the following monitoring:

1. WET testing of the discharged effluent for a full range of operational scenarios (i.e. shock dosing, etc.) to ensure complete confidence in the potential effects of co-discharged constituents and the antiscalant to be used.
2. Periodically assess bacterial regrowth
3. Heavy metals, residual chlorine and dissolved oxygen levels
4. Establish a baseline of shallow subtidal invertebrate macrofaunal communities. Sample annually for a period of at least 4 years.

If the set parameters at the potable water side are not met, a valve will shut and the water will be directed to the sea until the problem has been rectified. The desalination plant control system will provide a high level of automation. Start-up of the desalination plant will be manually initiated by the plant operators from the desalination plant control system. After operator initiation, the plant start-up sequences, normal operation and plant shut-down sequences will be managed automatically by the control system.

Monitoring and control will be predominantly carried out from the central control room, located in the plant administration building, with a second control room located at a remote location at the facility. A capability will also be provided to connect laptop HMI units at various points around the site to facilitate commissioning and maintenance activities over the life of the plant. In addition to the plant SCADA system the on line process data will be recorded to a database that will be dedicated to maintenance history, maintenance costs and asset register updates.

Uninterruptible power supply (UPS) units will be installed to maintain continuous power to the HMIs, and Programmable Logic Controllers (PLCs) around the site. UPS power will also back up the interface router, switches and other nominated important equipment to ensure minimum communication capability is maintained even if the main power supply has failed.

2. Provide the frequency of monitoring of the above mentioned monitoring point(s).

As noted in Section 1.1 above, monitoring of effluent quality throughout the proposed plant will be conducted using both on-line instrumentation and grab sampling with laboratory analysis. In general, the provision will be made for sampling of every process stream before and after every process change. The quality of seawater into and **discharge of effluent** from the proposed desalination plant will be **continuously** monitored by on-line instrumentation. Monitoring will be automated; therefore the frequency of reporting can be pre-set to required frequency.

3. Provide a detailed description of the type of monitoring, management strategies and maintenance plans implemented for effluent quantity and quality, the receiving environment as well as structural integrity of the pipeline.

Refer to Section 2 above. It is important to note that the proposed project is not in operation yet and this current CWDP application is for a **new** coastal outfall pipeline. Hence, there are no current maintenance plans in place for recording/monitoring devices. The plant will be designed and the process equipment selected for continuous operation 24 hours/day and 350 days/year, with approximately 15 days/year allowed for maintenance. The anticipated life-span of the desalination plant is a minimum of 20-25 years, with provisions to expand and renew equipment as and when required.

All administrative, control, laboratory and maintenance functions associated with the operation of the proposed desalination plant would be located in one structure (i.e. the Plant Administration Building). The operation and maintenance of the plant could be undertaken by either Umgeni Water staff or a specialized private contractor. The operation and maintenance staff would be responsible for all activities and costs associated with plant maintenance including:

- Preparation of the annual maintenance plan;
- Routine equipment inspections, repairs and upkeep;
- Scheduled equipment maintenance;
- Emergency equipment maintenance;
- Major equipment overhauls;
- Building and grounds maintenance; and
- Maintenance of spare parts inventory.

A pipe 'pigging' system for regular maintenance and cleaning of the seawater supply lines (intake only) may be installed. This will involve the use of a 'pig' (bullet-shaped device with bristles), which will be introduced into the seawater intake tunnel to remove marine growth, and transfer the feed water from the pump station to the desalination plant to mechanically clean the tunnel.

In addition, the RO membranes need to be cleaned at regular intervals. Depending on the quality of the feedwater, membrane cleaning is typically undertaken at intervals of three to six months.

The proponent will also follow guidance from the following document: "Water Quality Management Series, Sub-series no. MS13.3, Operational Policy for the disposal of land-derived water containing waste to the Marine environment of South Africa: Guidance on Implementation". This document provides guidance on the frequency and scope of integrity and dispersion monitoring of marine pipelines.

Monitoring of marine pipeline integrity

The stability and structural integrity of the outfall discharge system will be inspected at a minimum frequency of once annually as well as after major storms. An underwater video recording of the exposed sections of the pipeline, diffuser, ports and riser unit (where relevant) will be done to check the structural and physical condition, as well as its operation. This should be referenced to the design criteria and intended operation. The seabed infrastructure for Tongaat will be inspected in the fashion described above. For buried sections, the integrity of the outfall concrete tunnel/pipeline would be inspected by means of a remote operated vehicle (ROV) with camera, or via acoustic inspection techniques. For the latter, a drogue with acoustic sensor is deployed into the operational pipeline. This method produces a spectrogram which describes the integrity of the conduit.

Monitoring of brine dispersion (environmental monitoring)

A detailed environmental monitoring programme with site specific objectives will be designed for the effluent discharges from Tongaat. The numerical modelling performed for the discharge fate will be used to design the monitoring programme. This programme is likely to include the collection of water samples and testing of salinity levels as well as the presence of any co-discharges which are allowed for in the authorisation. It is also likely to include checks on biota for ecological evaluations (biological measurements include field measurements on relative abundance, the diversity of the species and composition of the biological communities). Ecological evaluations should be measured against the baseline information and the use of indicator species is recommended. The locations of the sampling points and measurements will be based on the modelling and used to confirm the boundaries of the

affected areas. It is recommended that sampling frequencies be biannually, i.e. a winter and a summer sample.

Long term monitoring programmes will be dynamic and need to be adjusted continuously to incorporate new knowledge from the previous monitoring exercises.

Monitoring of the flow and constituents in the effluent at the reverse osmosis plant will be done on a frequent basis. This is to ensure that the discharge falls within the environmental authorisation. Flow will be monitored continuously by means of a calibrated flow meter and effluent constituents by means of discrete sampling which should be tested at an approved laboratory.

4. Provide the historic data on monitoring and compliance for the coastal outfall pipeline. Attach your information to this application form.

No historic data is available on monitoring and compliance as this application is for a **new** coastal outfall pipeline that is being proposed.

5. Provide a detailed description of maintenance plans in place for recording/monitoring devices, if any.

It is important to note that the proposed project is not in operation yet and this current CWDP application is for a **new** coastal outfall pipeline. Hence, there are no current maintenance plans in place for recording/monitoring devices.

6. Provide a detailed description of maintenance plans in place for treatment facilities, if any.

It is important to note that the proposed project is not in operation yet and this current CWDP application is for a **new** coastal outfall pipeline. Hence, there are no current maintenance plans in place for treatment facilities. However, listed below are some of the general maintenance plans/factors that will be adopted during the proposed project (should an Environmental Authorisation be granted).

Domestic wastewater (sewage and grey water) generated (from potable use) will be collected and treated on-site in a septic tank system. In this instance, it is assumed that grey water will include capture of wastewater generated from on-site vehicle washing, floor washing, etc. Appropriate wastewater collection systems will be provided for these purposes. It is anticipated that any chemical/oil waste generated will be collected and disposed of at an appropriate off-site facility.

Recommendations for maintenance have also been included in the Environmental Management Programme and specialist studies as part of the Draft EIA Report, where applicable.

7. Provide a copy of any prior authorisation issued for the coastal discharge by the Department of Water Affairs, including a record of compliance for the last 12 (twelve) months to such an authorisation. Attach your information.

No prior authorisation has been issued for the proposed coastal discharge by the Department of Water and Sanitation as this application is for a **new** coastal outfall pipeline that is being proposed.

8. For **existing outfalls**, do you have a lease agreement issued in terms of the Sea Shore Act, 1935 (Act No. 21 of 1935) for the pipeline below the high water mark or proof of submission of an application for such a lease agreement to the relevant authority? **NO X**

This application is for a **new** coastal outfall pipeline.

9. If YES, attach the proof thereof.

Not applicable as this current CWDP application is for a **new** coastal outfall pipeline.

10. Provide details of the mandatory reporting regime as contained in Annexure 1 (Reporting).

Section 2.11 of Annexure 1 states that the following details on the reporting regime should be included:

- "Permit Advisory Forum (PAF) (or equivalent body) comprising relevant stakeholders, with independent facilitation, at the cost of the permit holder.
- The results/findings of the monitoring programme mentioned above.
- The frequency, preparation and dissemination of the reports on compliance, trends and incidents as well as the annual marine impact assessments as required by the Department.
- The Review process in terms of the Waste/Water/Energy Hierarchy to ensure that best practice is considered to continuously improve the quality of the wastewater discharged to the marine environment".

It is important to note that this is not applicable and that no details of the reporting regime are available as the current CWDP application is for a **new** coastal outfall pipeline.

SECTION J CONTINGENCY AND DECOMMISSIONING PLANNING

1. Provide information on pipeline incidences, continuous improvement plans, contingency plans for effluent discharge and decommissioning plans implemented at or adopted by the facility for the past 12 (twelve) months, if available.

This application is for a **new** coastal outfall pipeline. No information on pipeline incidences, continuous improvement plans, contingency plans for effluent discharge and decommissioning plans implemented

at or adopted by the facility for the past 12 (twelve) months is available (i.e. the pipeline is not operational currently).

However, as part of the EIA Phase, an Environmental Management Programme has been compiled and it includes monitoring recommendations for mitigation measures proposed for the construction, operation and decommissioning phases of the proposed project. The Environmental Management Programme also includes recommendations for potential spillages (i.e. contingency measures) and to reduce impacts that are predicted during all phases of the proposed project. During decommissioning, wastewater discharge will include domestic wastewater (sewage) and stormwater runoff (if contaminated, the stormwater should be regarded as a wastewater).

SECTION K SPECIALIST TECHNICAL AND ENGINEERING REQUIREMENTS

1. Provide a detailed report on the following specialist technical and engineering requirements (refer to Annex for more on the generic requirements) if applicable:
 - 1.1 Scope of study area and features
 - 1.2 Biogeochemical processes (water column and sediment)
 - 1.3 Marine ecology
 - 1.4 Microbiological Factors
 - 1.5 Hydraulic design
 - 1.6 Achievable dilution
 - 1.7 Sedimentation/re-suspension of solid phase particles
 - 1.8 Pipeline construction considerations and structural design (including decommissioning)

Specialist studies were completed as part of the EIA Phase for the proposed Seawater RO Plant and associated infrastructure project (DEA Reference: 14/12/16/3/3/2/652). The following specialist and technical reports were included in the EIA Phase of the proposed project and are included in the draft EIA report:

- Marine Ecology Assessment;
- Freshwater Ecology Assessment;
- Terrestrial Ecology Assessment;
- Social and Economic Assessment;
- Visual Impact Assessment;
- Noise Impact Assessment; and
- Heritage Impact Assessment

As part of each of the above specialist studies, a detailed description of the study area and features (in terms of each specialist aspect) was compiled.

In parallel with the EIA Phase, a detailed “Desalination Options and Feasibility Report” was compiled by the appointed consulting engineers in April 2015 as part of the Feasibility Phase. The Feasibility Report includes the following main aspects:

- Seawater quality assessment, including microbiological factors;

- Marine modelling and engineering (including Brine Diffuser and Near Field Dilution Modelling, Hydrodynamic and Plume Dispersion Modelling, Biogeochemical processes and Hydraulic design, Sea Water Intake and Brine Outfall Preliminary Design (achievable dilution, pipeline construction consideration etc.), Sedimentation/re-suspension of solid phase particle);
- Pipelines and pump stations; and
- Geotechnical investigations.

No decommissioning of offshore infrastructure due to extensive environmental disturbance impacts that would be associated with the removal of infrastructure of this scale.

Note that the “Project description” chapter (Chapter 2) of the EIA Report contains information extracted from the Feasibility Report.

2. Describe any gaps in the above knowledge, any underlying assumptions made and any uncertainties when conducting the above specialist study (ies) in the above mentioned detailed report.

The gaps in knowledge, limitations and assumptions for each of the abovementioned specialist study are included within each relevant specialist study as part of the EIA report.

DECLARATION

I Phumi Nkomo, in my personal capacity or duly authorised as Environmental Scientist (state your capacity) by Umgeni Water thereto hereby declare that I:

- regard the information contained in this application form and associated documentation submitted to be true and correct, and
- am fully aware of my responsibilities in terms of **Section 69 of the Integrated Coastal Management Act, 2008 (Act No. 24 of 2008)**;
- have provided access to all information at my disposal that is relevant to the application;
- will be responsible for the costs incurred in complying with the environmental legislation including but not limited to –
 - costs incurred in connection with the appointment of a specialist/ consultant ;
 - costs incurred in respect of the undertaking of any process required in terms of this application;
 - costs in respect of any fee prescribed by the Minister in respect of this application and the discharge; and
 - the provision of security to ensure compliance with the applicable management and mitigation measures;
- am responsible for complying with the conditions that might be attached to any decision(s) issued by the Department;
- have the ability to implement the applicable management, mitigation and monitoring measures; and
- hereby indemnify, the government of the Republic, the Department of Environmental Affairs and all its officers, agents and employees, from any liability arising out of, inter alia, the content of any report, any procedure or any action for which the applicant or environmental assessment practitioner is responsible.

Please Note: If acting in a representative capacity, a certified copy of the resolution or power of attorney must be attached.

[Signature](Signature) Durban(Place)
 (yyyy/mm/dd) 2016/05/26(Date) Environmental Scientist(Designation/capacity)
Umgeni Water(Name of company/municipality/organisation)

	Name and Surname	Address	Signature
Witness 1	<u>[Signature]</u> Dukle Nyano	88 Dunkeld Road Durban	<u>[Signature]</u>
Witness 2	<u>[Signature]</u> Gugu Myeza	88 Dunkeld Road Durban	<u>[Signature]</u>

FINAL Check list (tick the box were applicable)

- | | | |
|-----|--|--|
| 1. | Paid prescribed application fee..... | <input type="checkbox"/>
<input type="checkbox"/> |
| 2. | Motivation for the discharge as a BPEO..... | <input type="checkbox"/> |
| 3. | Specialist technical and engineering requirements for assessment (Annexure 1)..... | <input type="checkbox"/> N/A |
| 4. | Environmental Authorisation and details, if applicable..... | <input type="checkbox"/> |
| 5. | Lease agreement issued in terms of the Sea Shore Act, 1935 (Act No. 21 of 1935) for the pipeline below the high water mark or proof of submission of such an application, if applicable..... | <input type="checkbox"/> N/A
<input type="checkbox"/> |
| 6. | A copy of the baseline marine impact assessment for the receiving environment surrounding the coastal outfall pipeline..... | <input type="checkbox"/> |
| 7. | A report outlining the impact of the effluent on the coastal receiving environment..... | <input type="checkbox"/> |
| 8. | Information on any public forum established for the coastal outfall pipeline, including minutes of such meetings if applicable.....
... | <input type="checkbox"/> |
| 9. | A copy of all comments and responses received and made during the public participation period | <input type="checkbox"/> N/A |
| 10. | A copy of any prior authorisation issued for the coastal discharge by the Department of Water Affairs..... | <input type="checkbox"/> |
| 11. | Record of compliance for the last 12 (twelve) to the authorisation mentioned above..... | <input type="checkbox"/> N/A |

LIST OF APPENDICES

Appendix A: Effluent Flow Chart

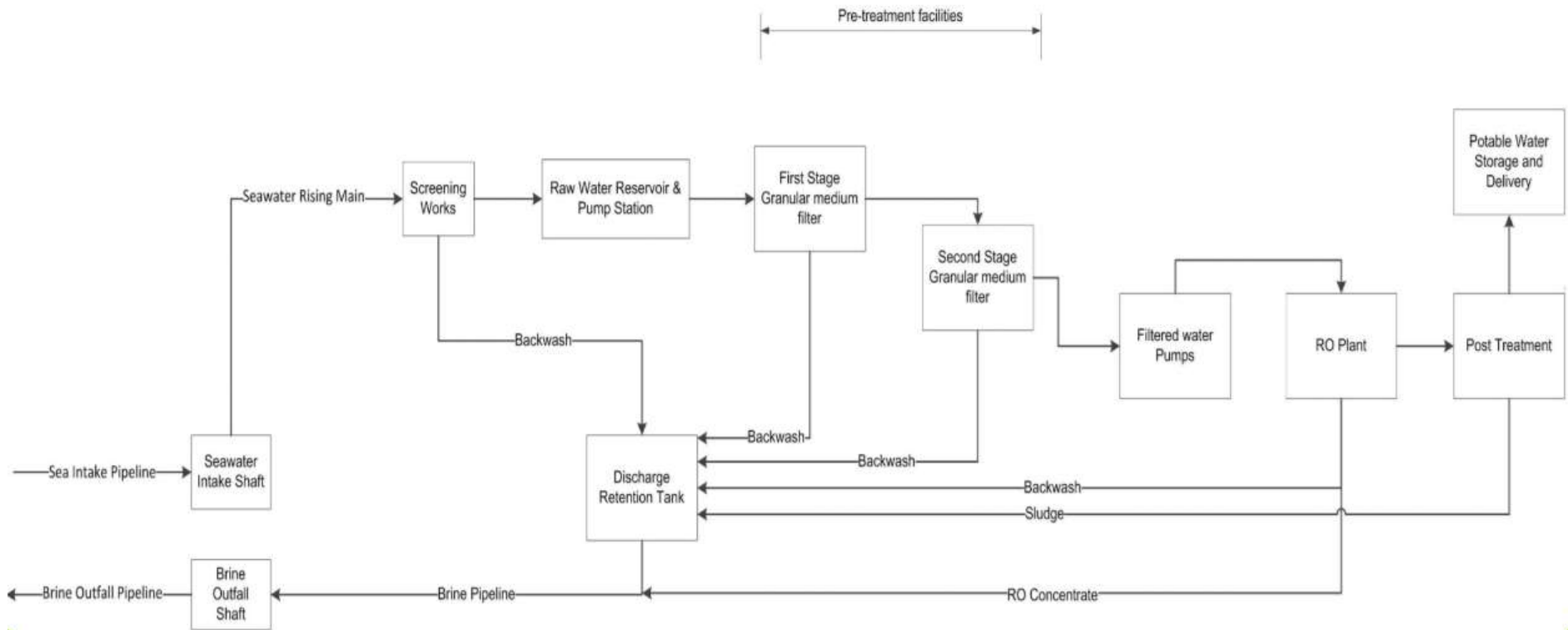
Appendix B: Site Map

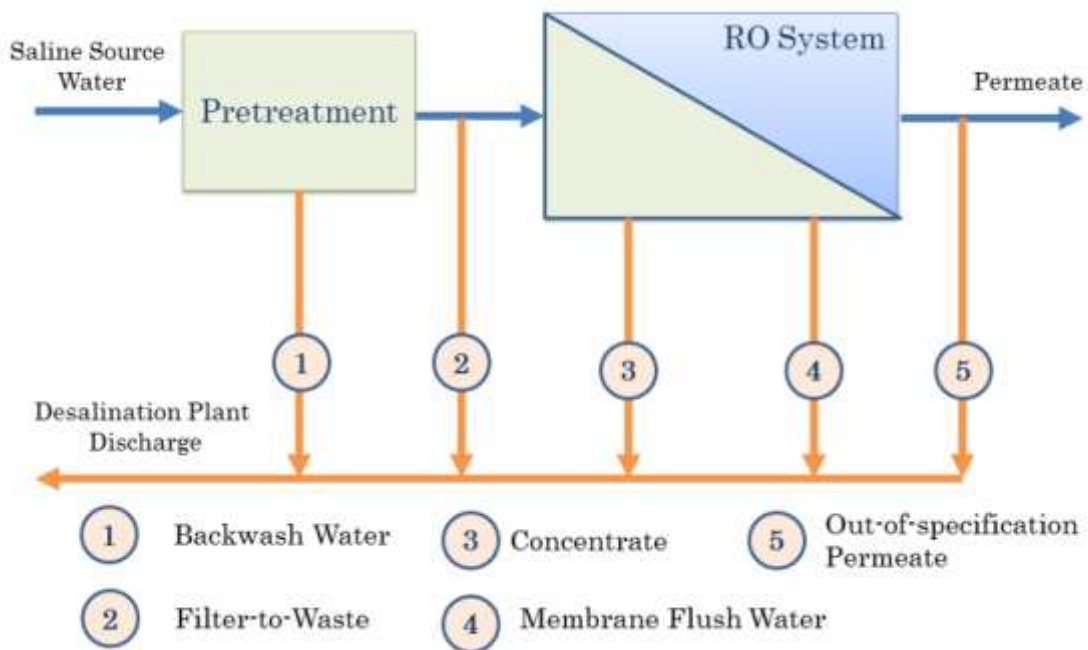
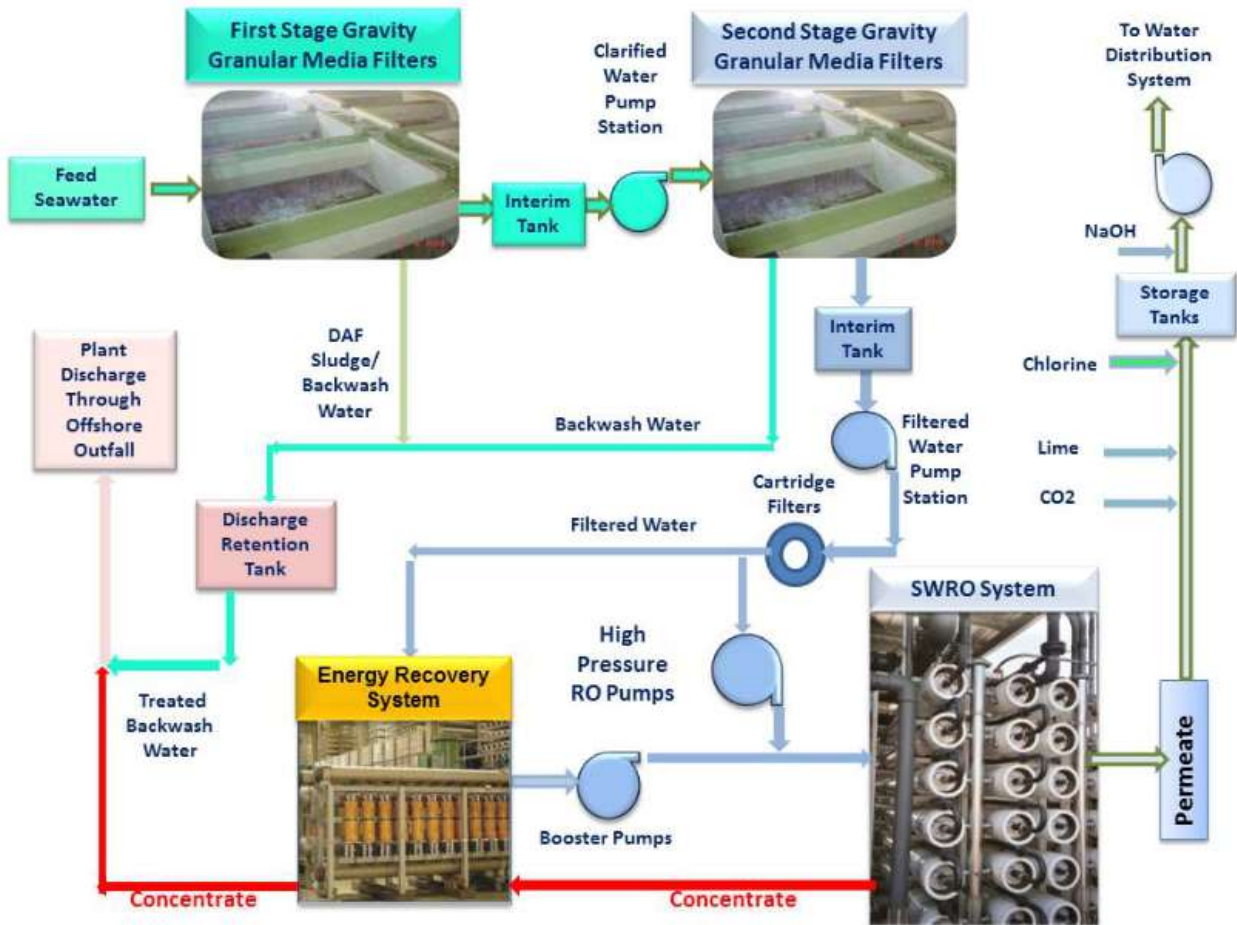
Appendix C: Proof of Payment of Application Fee

Appendix D: Affected ERF numbers

Appendix A

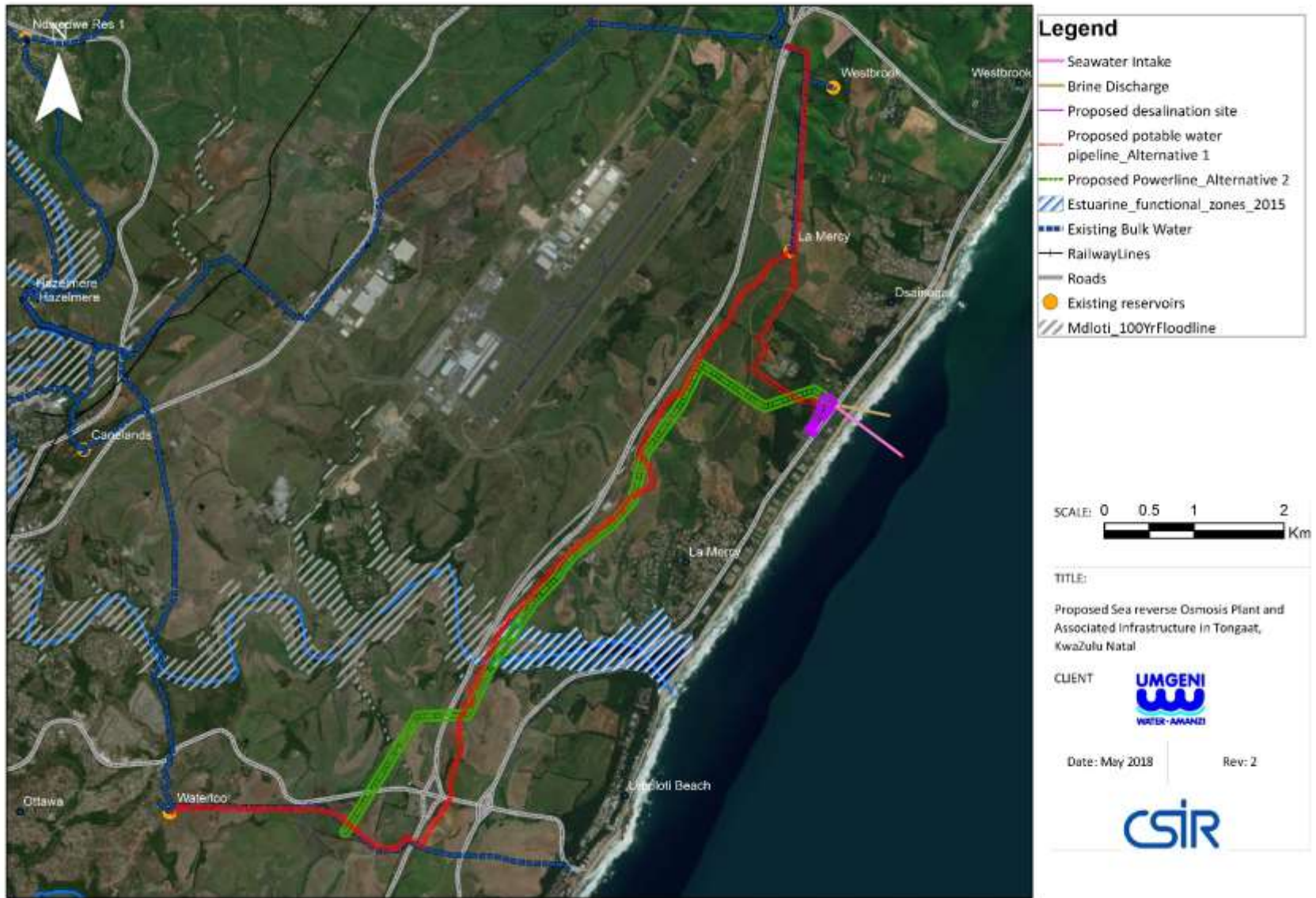
Desalination Plant Flow Chart





Appendix B

Site map



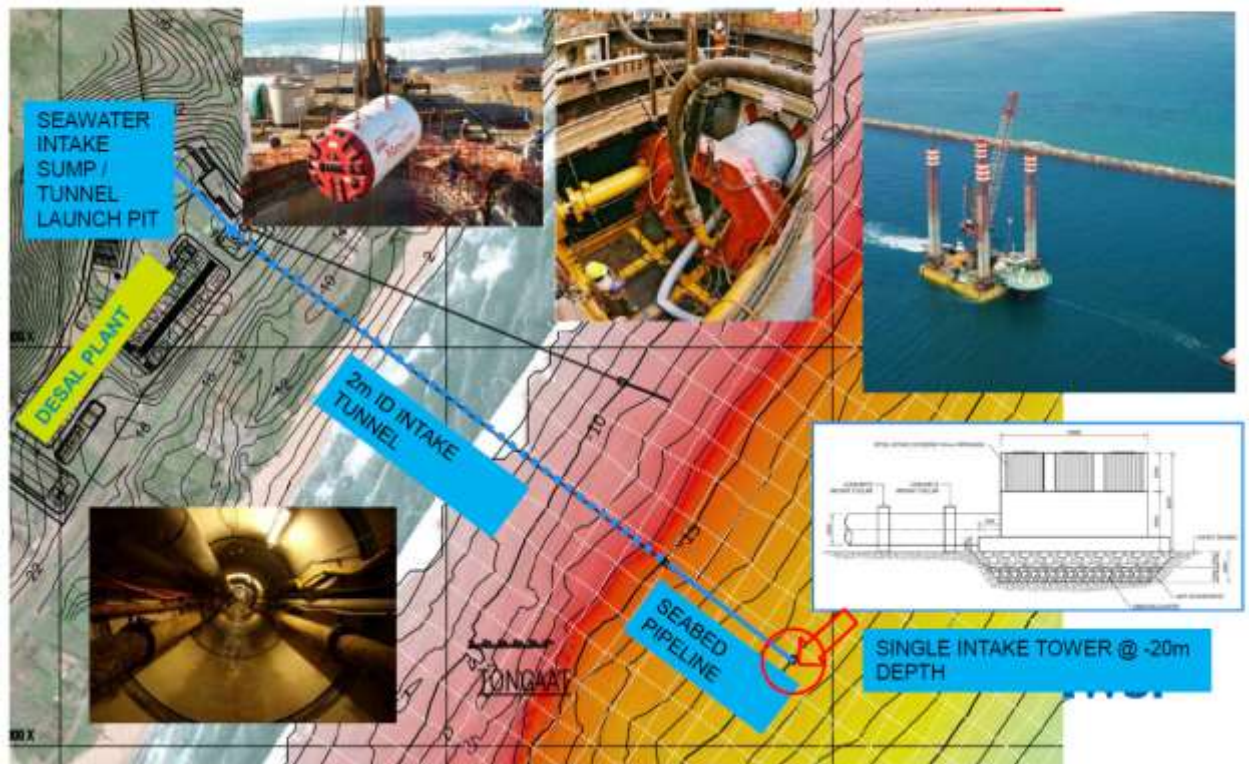


TONGAAT

- - - - Proposed potable water pipelines
- Proposed 132kV supply
- Proposed SWRO plant
- Existing bulk water infrastructure
- Mdotl_100YrFloodline
- ▲ Existing reservoirs
- +— Railway Lines
- Rivers
- Roads



Tongaat Intake



Appendix C

Proof of Payment of Application Fee

NOT APPLICABLE

Appendix D

Directly affected ERF/Farm numbers

