ENVIRONMENTAL IMPACT ASSESSMENT

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

SECOND DRAFT EIA REPORT

CHAPTER 1: INTRODUCTION

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1. INTRODUCTION

Umgeni Water is proposing to construct and operate a 150Ml/day sea water desalination plant in the Tongaat area (on the north coast of Durban, within the eThekwini Municipality) using sea water reverse osmosis technology (SWRO). The proposed plant will supply fresh water to the eThekwini municipality (50%) and to the Ilembe District (50%). Umgeni Water (i.e. the Project Applicant) has appointed the Council for Scientific and Industrial Research (CSIR) to undertake the requisite Environmental Impact Assessment (EIA) and determine the biophysical, social and economic impacts associated with undertaking the proposed activity. The proposed project requires an EIA in terms of the National Environmental Management Act (Act 107 of 1998, as amended) (NEMA) and its amended EIA Regulations (i.e. Government Notice (GN) R543, R544, R545 and R546); as promulgated on 18 June 2010.

1.1. PROJECT PROPONENT

Umgeni Water, a state-owned entity, is the largest supplier of bulk potable water in the Province of KwaZulu-Natal, South Africa. The organisation was established in 1974, and has grown over the years to become an entity of strategic importance in KwaZulu-Natal. Umgeni Water has six municipal customers, namely eThekwini Metropolitan Municipality, Ilembe District Municipality, Sisonke District Municipality, Umgungundlovu District Municipality, Ugu District Municipality and Msunduzi Local Municipality. The organisation currently supplies 426 million m^3 of potable water to its six municipal customers.

Approximately 92% (1072 Ml/d) of the water provided by Umgeni Water to the six water service authorities it supplies, is sourced from the Mgeni system. This system consists of an extensive network of pipelines, aqueducts, water treatment works and reservoirs, supplied from the Midmar, Albert Falls, Nagle and Inanda Dams in the Mgeni System, as well as from Hazelmere Dam on the Mdloti River. The Mooi-Mgeni transfer scheme supplements the supply of water in the upper Mgeni River (Midmar Dam).

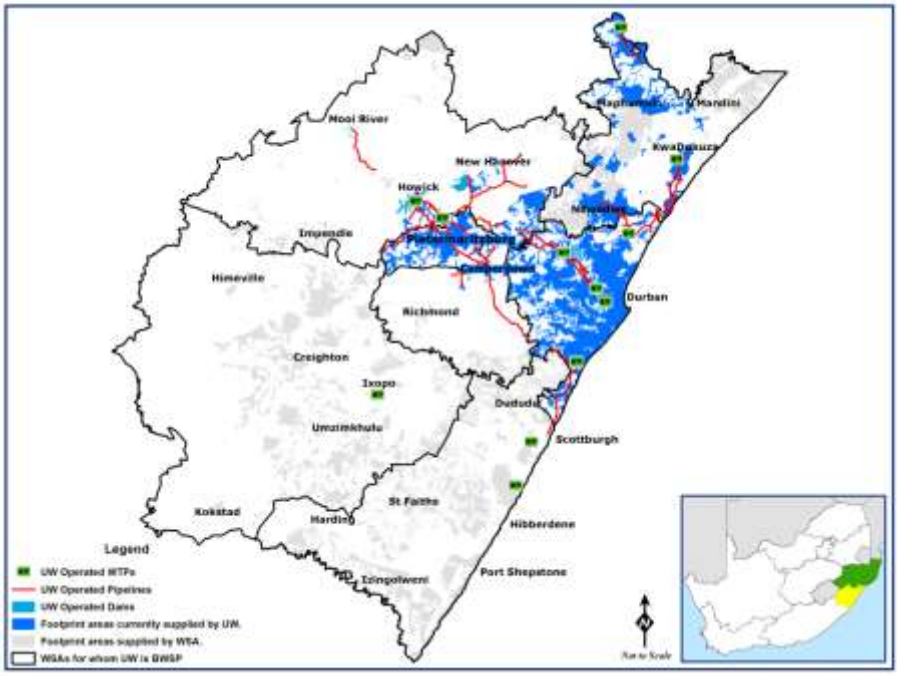

Figure 1-1: Umgeni Water Operational Area

1.2. PROJECT LOCATION

As noted above, Umgeni Water is proposing to construct and operate a desalination plant at Tongaat on the KwaZulu-Natal (KZN) North Coast using SWRO technology (Figure 1.2).

An initial site selection screening study was undertaken by Umgeni Water in 2010/2011 for site identification and assessment of the desalination plant and the associated infrastructure on the KZN coastline. That study investigated five potential sites on the KZN North Coast for the possible implementation of a desalination facility. On the basis of various environmental and social screening criteria (as highlighted in Chapter 2), the outcomes of the site selection study indicated that the Mdloti and Tongaat sites on the KZN North Coast were the most favourable and were assessed further as part of a Phase 1 Due Diligence Report ("KwaZulu-Natal East Coast Desalination Plants, Detailed Feasibility Study, Phase 1 - Due Diligence Report", Aurecon 2012). This report provided an overview of the proposed desalination project and associated infrastructure; and included an overview of potential social and environmental impacts. Shortly after initial site visits as part of the Phase 1 Detailed Feasibility Study; it became apparent that the potential estuarine impacts, particularly at the Mdloti site, warranted the further investigation of an alternative option for a northern site. Hence, the non-estuarine Tongaat site near Desainager was considered to be the next best alternative for the northern area. Following on from the Phase 1 Due Diligence study, a Phase 2 Feasibility Study was undertaken by the appointed consulting engineers and completed in June 2015 (Aurecon, 2015), and this has been used to inform this EIA Process.

Figure 1-2: Locality Map of the proposed Tongaat desalination facility

1.3. PROJECT COMPONENTS

The proposed plant will produce 150 Ml/day of freshwater when at final capacity, and will have an average inflow rate of 389 Ml/day. To give one an idea of volume and scale, this would equate to providing 187 500 four-person households with water daily assuming a 200 l/person/day scenario.

Approximately 183 Ml/day of brine (concentrated sea water) will be discharged into the sea. The plant will have a payback period of 20-25 years with the potential of a lifespan extension. It may be constructed in two phases over a period of five years and will occupy an area of approximately ±70 000 m^2 (excluding servitudes for pipelines). The project will require approximately 30 MW (i.e. between an estimated 4.0 and 4.5 kWh/m^3 of potable water produced), including the power required to pump water to the plant from the sea and to deliver potable water to the bulk supply infrastructure. The desalination plant will consist of the following 'Linear' and 'On-site' elements:

Linear Infrastructure:

- Sea water (source water) intake with screens, sea-bed pipeline laid on the ocean floor connecting vertically into an offshore tunnel which connects to the seawater pump station located a short distance inland;
- Brine outfall constructed from the sea water pump station by means of an off-shore tunnel connecting vertically to a diffuser pipeline structure on the sea bed;
- Terrestrial pipelines comprising a very short seawater pipeline between the seawater pump station (located at the desalination plant) and the desalination plant itself, a very short brine pipeline from the plant back to the seawater pump station, and treated water pipelines and a pump station connecting to the existing North Coast System via the La Mercy Reservoir; and
- Electrical power line and transformer yard infrastructure.

On-site Infrastructure:

- A sea water pump station located within the desalination plant operational site;
- Pre-treatment facilities including flocculation, Dissolved Air Flotation if required (DAF) and pre-treatment membrane filtration (Ultrafiltration);
- SWRO system (with energy recovery equipment) including cartridge filtration and reverse osmosis membranes;
- Pre-treatment and Reverse Osmosis (RO) buildings and other smaller water treatment related infrastructure;
- The extension and/or upgrading of existing access roads;
- The development of internal access roads;
- All chemical infrastructure for conditioning of the pre and post-filtered water;
- Two freshwater holding reservoirs each of 37.5 Ml capacity;
- Domestic sewerage treatment facility;
- Stormwater handling facility;
- Primary electricity building to be connected to 132/11kV substation;
- Desalination plant waste streams handling and treatment facilities;
- Solid wastes (i.e. screenings) handling and storage facilities; and
- A total operational site of approximately 70 000 m^2 (7 ha) including all on-site infrastructure enclosed by an approximately 3 m high security fence.

The alternatives included in this EIA Report are the most feasible and likely development options in terms of environmental, social and technical criteria. All reasonable measures to forecast the expected environmental outcomes of the proposed Umgeni Water desalination development have been undertaken as far as possible and within the full ambit of the NEMA EIA Regulations.

The alternatives noted in the Final Scoping Report were at an early stage in the EIA Process. As such, certain modifications and changes to the proposed alternatives have become necessary as a result of the findings of the detailed Feasibility Study and Specialist studies. These changes are noted in detail in Chapter 2 and give Umgeni Water a reasonable opportunity to respond proactively to environmental impacts identified during the impact assessment process. Whereas discrete alternatives are generally identified during the pre-feasibility stages and comparatively assessed during the assessment phase, incremental modifications and changes to activities, sites and proposed linear developments might also have to be considered when/if this development proposal is amended. This is done in an incremental manner throughout the EIA process to address issues and impacts when they are identified i.e. modifications to pipeline routes.

1.4. PROJECT AIM

As noted above, the proposed Umgeni Water desalination plant will produce 150 Ml/day of potable water when at final capacity and will aim to ensure the promotion of sustainable economic development by serving the interests of a growing population as well as other commercial interests in the region. It is recognised that the future of the North Coast region of KZN is greatly dependent on an alternative water source to augment water supply of which desalination is one option.

The main objectives of the desalination plant are therefore; to develop a long term, sustainable alternative water source for the east coast region that is rainfall/climate-independent and ensures long-term security of supply, and to establish a world-class and cost-effective desalination plant, whilst minimising the harmful environmental impacts of the desalination plant through comprehensive scientific investigation and consistent stakeholder engagement. The following national and international literature will provide a strong interpretive basis upon which this EIA is undertaken. These will include, *inter alia*, the following:

- **United Nations Environmental Programme** (UNEP). 2008. Resource and Guidance Manual for Environmental Impact assessment for Desalination.
- **The World Health Organisation**. 2011. Safe Drinking Water from Desalination.
- **Latterman, S**. 2011. The Development of an Environmental Impact assessment and Decision Support system for Seawater Desalination Plants.
- **The Department of Water Affairs and Forestry** (DWAF). 2007. Guidelines for the Evaluation of the Possible Environmental Impacts during the Development of the Seawater Desalination Process.
- **The Department of Water Affairs and Forestry** (DWAF). 2004. Operational Policy for the Disposal of Land-Derived Water Containing Waste to the Marine Environment of South Africa.

1.5. NEED AND DESIRABILITY OF THE PROJECT

South Africa is generally a water scarce country. Large dams are required to store water for cities, especially during droughts. Much of the easily available water resources are now almost totally developed – the Mgeni Catchment in KZN is a typical example of this and now has four large dams.

According to the South African National Water Resource Strategy (DWA, 2013), South Africa faces serious water challenges in the near future if the economic growth envisaged for the country is to be sustained. As conventional water resources near their full yield potential and with climate change likely to increase the risks associated with water supply, the attention is slowly focusing on sea water desalination as one of the solutions to the looming water crisis in many South African coastal towns and cities.

The National Climate Change Response Green paper for South Africa (DEA, 2010), suggests that rainfall in South Africa is highly variable in spatial distribution and unpredictable, both within and between years. Much of the country is arid or semi-arid and the whole country is subject to droughts and floods. Bulk water supplies are largely provided via a system of large storage dams and inter-basin water transfer schemes. Thus, a reduction in the amount or reliability of rainfall, or an increase in evaporation may exacerbate the already seriously limited surface and ground water resources in South Africa. Water availability in the arid and semi-arid regions - which cover nearly half of the country - is particularly sensitive to changes in precipitation (Hewitson and Crane, 2006).

Climate change has the potential to undermine poverty alleviation efforts and have severe implications for food security, clean water, energy supply and environmental health. The health sector, agricultural production, biodiversity, water resources and rangelands have been identified as areas of highest vulnerability to climate change and these are the areas that need to be targeted for adaptation measures where possible (DEAT, 2004). The social and ecological impacts of climate change and population growth associated with all these sectors need to be mitigated as far as possible through a combination of effective management and technological reasoning. With regard to the latter, desalination may offer a mechanism through which many of these impacts can be mitigated or at least reduced to an extent. This will however require a proactive and interpretative policy stance at national level.

The then Department of Water Affairs and Forestry (DWAF) declared that "water scarcity has been identified in the major urban centres. These major urban areas anchor the country's economy, and the Department has to invest heavily in the diversification of its water mix in order to prevent serious water shortages from adversely impacting on our economy. In addition to the traditional augmentation schemes, two major ways that water supplies can be augmented are the treatment of effluent and the desalination of sea water for productive use. For the latter, major advances in the field of membrane technology during the past two decades have meant that RO as a means of sea water desalination has become a competitive alternative water source. A key principle behind assuring local water supplies is to limit the expense of transporting water by keeping supplies as close to the end-user as possible" (DWAF: Water for Growth and Development Framework, 2011).

As noted above, the Spring Grove Dam was constructed as part of an inter-basin transfer scheme between the Mooi River and the Mgeni Catchment to augment the water resources in the Mgeni. However, with the current growth in water demand, even this scheme will soon not be enough to provide the required assurance of supply to Durban, Pietermaritzburg and surrounding areas. The Department of Water and Sanitation's Reconciliation Strategy Study for the Kwazulu-Natal Metropolitan Coastal Areas (2015-Ongoing) indicates that even with further augmentation of the Mgeni System (including the implementation of Spring Grove Dam and the planned Mooi-Mgeni Transfer Scheme Phase 2) by an additional 137 Ml/day (50 million m^3/a), the supply of water in future will still not exceed the required 99% assurance of supply (Figures 1-3 and 1-4). This was also confirmed by Umgeni Water planning services division which undertakes long term plans (Supply and Demand forecasts) for all areas supplied by Umgeni Water. Therefore, alternative schemes such as the proposed Lower Thukela Bulk Water Supply Scheme, Mvoti Dam and uMkhomazi project are also being considered. Phase 1 of the proposed uMkhomazi Water Project is planned to secure an additional 600 Ml/d (220 million m^3/a). This involves the potential development of Smithfield Dam located along the central reaches of the uMkhomazi River, with a storage capacity of 250 million m^3 (250 000 Ml).

It must be noted that the capital cost for the proposed Smithfield Dam and associated infrastructure would be about R28 billion and the scheme would take many years to construct.

Umgeni Water has therefore identified a 150 Ml/day sea water desalination plant in the Tongaat area using RO technology as a possible alternative that could be implemented fairly quickly to meet the growing water demand and ensure the sustainable economic development of the region. This project

would supply water to Umgeni Water's North Coast Supply System and to some of the areas supplied by eThekwini's Northern Aqueduct by reversing the flow from Waterloo Reservoir. In that case, there would not be an additional option for supply and the existing supply schemes will not have the capacity to supply the future needs.

Table 1-1: Umgeni Water Supply

Areas	ML/day
eThekwini Metro	820
Mzunduzi LM	171
Ugungundlovu DM	51
Ilembe DM & SSW	42
Ugu DM	40
Harry Gwala DM	2
TOTAL	**1126**

Table 1-2: Available Yield

Infrastructure	ML/day
Mgeni System (MMTS1)	1004
Hazelmere	45
South Coast	20
Other (approximately)	57
TOTAL	**1126**

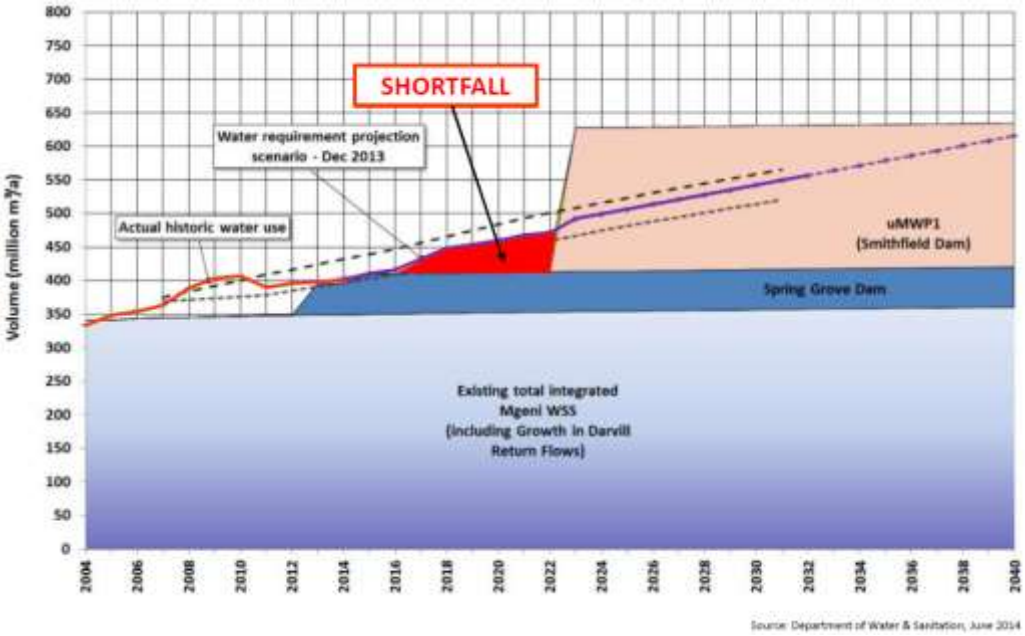

Figure 1-3 MGENI System Yield (DW, June 2014)

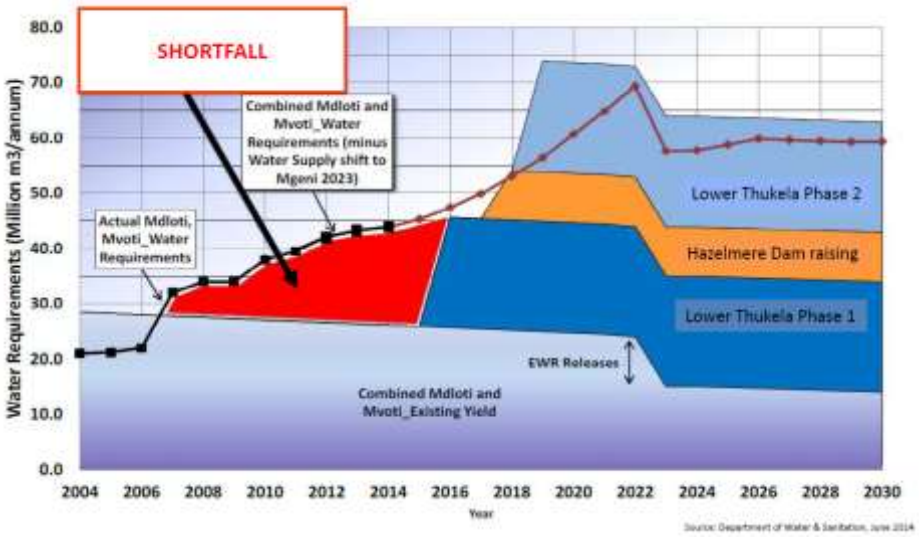

Figure 1-4 North Coast System Yield (DW, June 2014)

According to Umgeni Water (2018), the recent drought in KwaZulu-Natal adversely affected their ability to supply water at an adequate assurance level and restrictions had to be imposed in most systems. The affected areas were the entire eThekwini Municipality, parts of the iLembe District and the Middle South Coast. Restrictions of up to 50% were imposed in the Northern and Southern Areas and a 15% curtailment on water use was imposed in the Mgeni System. In addition, Umgeni Water had to implement an emergency scheme that transferred water from the uThongathi River to Hazelmere Dam to augment supply in the dam. Measures put in place were effective in slowing down the drop in the level of the Hazelmere Dam (Figure 1-5) (Umgeni Water, 2016). This Figure depicts the serious impact of the recent drought on the North Coast. Figure 1-6 below shows the levels of dams within the operational area of Umgeni Water on the 6th September 2015. This indicates the serious need for water within the region. Although in some areas, desalination plants have been constructed as a drought mitigation measure (i.e. once normal rainfall returns, the plant is no longer operated favouring traditional sources of water with lower operating costs), this desalination plant would not be constructed to mitigate the current drought but as a long term supply option similar to the plants in Perth, Australia which operate continuously all year round.

Umgeni Water's Infrastructure Master Plan shows that, even without the current drought, the water resources of the North Coast will not be able to meet the increased demand in five to ten years' time. It is therefore imperative that Umgeni Water augment the supply of water to the North Coast over the next five years to ensure that their customers within this region can receive a sustainable supply of water.

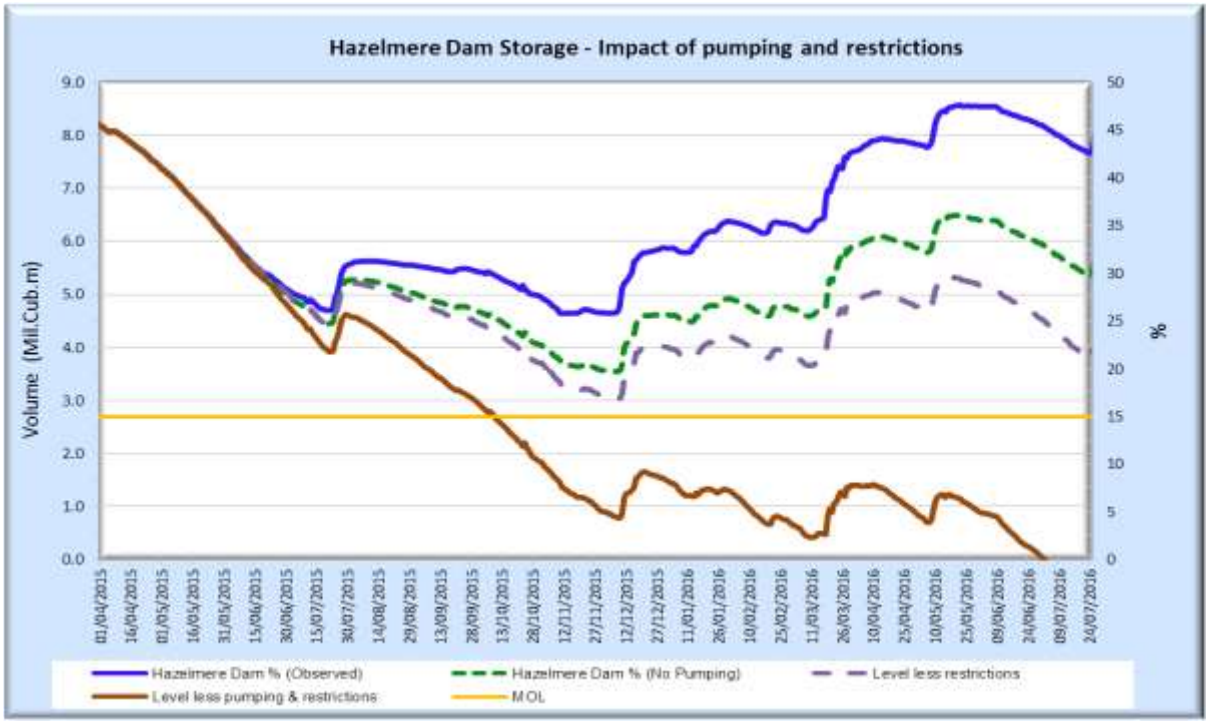

Figure 1-5 Impact of pumping from the uThongathi River on Hazelmere Dam (Umgeni Water, 2016)

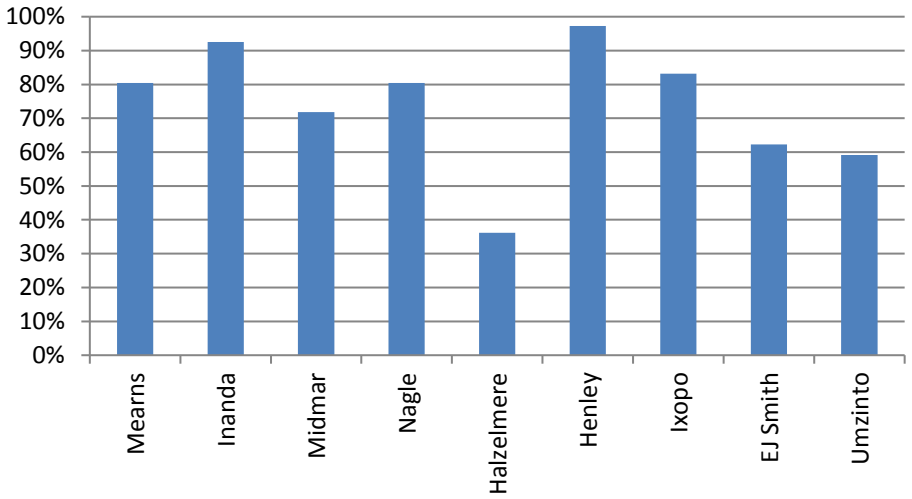

Figure 1-6: Dam Level Average within the Umgeni Water Operational Area (Jan-Oct 2015) (Umgeni Water, 2015)

It is an important requirement in the EIA Process to review the need and desirability of the proposed Tongaat Desalination Project. The guidelines on "Need and Desirability" published by DEA (DEA, 2017) list specific questions to determine the need and desirability of proposed developments. This checklist (Table 1-3) is a useful tool in addressing specific questions relating to the need and desirability of the project and will assist in explaining that need and desirability at the provincial and local context.

Table 1-3: List of questions to determine need and desirability including answers relevant to the proposed Umgeni Water desalination facility (GN No 38108).

1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?
1.1. How were the following ecological integrity considerations taken into account?
1.1.1. Threatened Ecosystems;
1.1.2. Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure;
1.1.3. Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"),
1.1.4. Conservation targets,
1.1.5. Ecological drivers of the ecosystem,
1.1.6. Environmental Management Framework,
1.1.7. Spatial Development Framework, and
1.1.8. Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).
Answer: A detailed Marine Ecology Assessment (Chapter 6), Terrestrial Ecology Assessment (Chapter 7) and Freshwater Ecology Assessment (Chapter 8) have been undertaken as part of the EIA Phase. These specialist assessments have each assessed the impact that the proposed project will have on the surrounding marine ecology, terrestrial ecology and aquatic ecology. The specialist studies have highlighted any threatened ecosystems, sensitive ecosystems, CBAs, conservation targets etc. The Terrestrial Ecology Assessment (Chapter 7 of this EIA Report) provides a list of Threatened or Protected Species that are considered to be associated with the region and the likelihood of their presence within the study area. In terms of the Integrated Development Plan (IDP), the eThekwini Municipality draft IDP (2017/22) identifies the provision of adequate water supply as one of the key development challenges in the Municipality, thus indicating that the proposed desalination development is well within the scope of the IDP. With respect to the iLembe District, the IDP (2015) identifies aged water and sanitation infrastructure as a key challenge. iLembe were also severely hampered by the drought of 2014/15 and diminished the Municipality's ability to provide water to all inhabitants. Broad spatial planning guidance for the site indicates that it has been earmarked for residential development in the future although it is currently used for agricultural purposes. This does not mean that strictly only residential development should take place on the site. It does, however, call for clear justifications for proposals for the site that do not entail residential development. One could argue that the supply of water for residential and other purposes would qualify as a reasonable justification in this regard. In essence, this is what eThekwini Municipality's Framework Planning Branch have done in their comments submitted to the EIA process where they raise no objections to the plant from a planning perspective given the potential for it to resolve water shortages in the Northern area of the Municipality.

1.2. How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?

Answer: A detailed Marine Ecology Assessment (Chapter 6), Terrestrial Ecology Assessment (Chapter 7) and Freshwater Ecology Assessment (Chapter 8) have been undertaken as part of the EIA Phase. These specialist assessments have each assessed the impact that the proposed project will have on the surrounding marine ecology, terrestrial ecology and aquatic ecology. The specialist studies have provided detailed mitigation measures and recommendations that should be adopted to avoid or minimise negative impacts on the surrounding ecological environment. Considering the mitigation measures inherent to the design and the additional mitigation measures provided by the specialists, the overall impact of the proposed project on the surrounding ecology is of very low to medium significance, with the exception of a high visual impact associated with construction activities. Furthermore, since all data and feasibility studies thus far have indicated that water demand will exceed supply in the near future and the desalination of sea water 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.

Furthermore, Umgeni Water have undertaken a number of holistic studies that have all determined that demand for water in the region will exceed supply in the near future, should a viable alternative source not be developed. This makes the development of the proposed desalination plant one of strategic importance to the sustainable economic development of the entire region. From this perspective, there can be no doubt that the desalination plant should occur in the Tongaat region and at this particular point in time.

1.3. How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?

Answer: A detailed Marine Ecology Assessment (Chapter 6), Terrestrial Ecology Assessment (Chapter 7), Freshwater Ecology Assessment (Chapter 8) have been undertaken as part of the EIA Phase. These specialist assessments have assessed the impact that the proposed project will have on the surrounding biophysical and socio-economic environment during the construction and operational phase. The specialist studies have provided detailed mitigation measures and recommendations that should be adopted to minimise negative impacts on the surrounding ecological environment. Considering the mitigation measures inherent to the design and the additional mitigation measures provided by the specialists, the overall impact of the operation of the proposed project on the surrounding ecology is of very low to medium significance, with the exception of a high visual impact associated with construction activities. Recommendations to enhance positive impacts have also been provided in the relevant specialist studies.

Furthermore, Umgeni Water have undertaken a number of holistic studies that have all determined that demand for water in the region will exceed supply in the near future, should a viable alternative source not be developed. This makes the development of the proposed desalination plant one of strategic importance to the sustainable economic development of the entire region. From this perspective, there can be no doubt that the desalination plant should occur in the Tongaat region. Given the urgent need to meet a growing demand for water in the region and lack of viable alternatives, the development of the proposed desalination plant in the Tongaat region is of the utmost importance to all residents and commercial activities in the area. In summary, there is little doubt that the community/area is in need of both the activity and the associated land-use.

1.4. What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?

Answer: As explained in Chapter 2 of this EIA Report, the proposed plant will generate the following waste streams:

- Concentrate from the RO desalination process;
- Dissolved air flotation (DAF) sludge (if a DAF clarifier is used as a pre-filtration system);
- Spent backwash water from the pre-treatment filtration system;
- Filter-to-waste water;
- RO and spent (used) membrane cleaning solutions and post-flush water generated during CIP (cleaning in place);
- Sludge from lime clarifiers; and
- Sanitary wastewater.

The total volume of all liquid waste streams generated by the desalination plant is estimated to be approximately 10 % of the total plant intake flow (i.e., 38.9 to 42.8 Ml/d). 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. With the brine, the volume of effluent discharged would be approximately 50 to 55 % of the plant intake flow. These volumes can be taken as maximum volumes and are based on the ultimate capacity of 150 Ml/day and will depend on the equipment supplier and exact volumes and composition.

The operation of the proposed desalination plant requires a Coastal Waters Discharge Permit in terms of the National Environmental Management: Integrated Coastal Management Act (Act 24 of 2008) in order to permit the disposal and discharge of effluent to sea.

Furthermore, small amounts of solid waste will be generated periodically (once every 3 to 4 weeks) from the operation of the plant intake screens. The amount of screenings generated per month is expected to vary between 20 and 100 kg/month. These screenings would typically be disposed of at a landfill site once or twice per month. The solid waste would include plant cartridge filters and membrane elements.

During the construction phase, the following waste materials are also expected:

- Packaging material from construction processes, such as the cardboard, plastic and wooden packaging and off-cuts;
- Domestic waste generated by construction personnel;
- Hazardous waste can be generated during the construction phase from empty tins, paint and paint cleaning liquids, oils, fuel spillages, asbestos roofing material (from the buildings) and chemicals;
- Building and demolition waste (i.e. rubble, discarded concrete, bricks, tiles, wood, glass, plastic, metals, soil, stones and other waste emanating from the demolition process);
- Waste generated from concrete mixing and pouring operations; and
- Excavated material from earthworks and foundations will also be generated.

Waste generation during the construction and operational phases of the proposed project are unavoidable.

All construction wastes will be collected and temporarily stored in waste collection bins and skips (or similar containers) on site. The skips will be emptied into trucks by the appointed waste removal contractor and it will then be taken to a licenced/registered landfill site.

All domestic waste generated during the construction phase will be disposed at a registered/licenced facility by an appointed contractor.

The Contractor shall remove refuse collected from the construction site at regular intervals. Records, such as waste disposal slips and waybills, will be obtained for the collection and disposal of the general and hazardous waste. These disposal slips should be kept on file for auditing purposes as proof of disposal.

During the operational phase, it is expected that general waste will be produced by the operational staff stationed at the office building. The general waste produced is expected to consist mainly of cardboard, paper, plastic, food containers, bottles etc. The waste will be stored in appropriately sealed and correctly labelled waste skips/containers at the plant. The waste will then be collected from the site by municipal services (i.e. Durban Solid Waste) and accordingly disposed of at a registered municipal disposal facility. However, waste recycling measures for waste types such as paper, tins and glass will be implemented where feasible to aid in measures to minimise waste to landfill site.

Construction and operational waste will be managed via the EMPr (Part B of this EIA Report), which includes management recommendations and mitigation measures for the handling and disposal of waste.

1.5. How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?

Answer: A Visual Impact Assessment specialist study has been undertaken as part of the EIA and is included in Chapter 10 of this EIA Report. The landscape character has a high sensitivity to the development. However, with the implementation of recommended mitigation measures, impacts on the landscape during the operational phase of the desalination plant are anticipated to be Medium Negative. Recommendations have been provided to mitigate the potential visual impacts. If mitigation measures can be successfully implemented, the overall significance of the visual impacts associated with the proposed project is anticipated to be medium during operation and Medium to High during the construction phase.

Broad spatial planning guidance for the site indicates that it has been earmarked for residential development in the future although it is currently used for agricultural purposes. This calls for clear justifications for proposals for the site that do not entail residential development. Arguably the supply of water for residential and other purposes would qualify as a reasonable justification in this regard and seems to reflect current thinking of the eThekwini Municipality's Framework Planning Branch in this regard. In essence, this is what eThekwini Municipality's Framework Planning Branch have done in their comments submitted to the EIA process where they raise no objections to the plant from a planning perspective given the potential for it to resolve water shortages in the Northern area of the Municipality.

A Heritage Impact Assessment was undertaken by the heritage specialists (Chapter 12). During site visits on 23 February 2015 and 22 July 2015 (during the EIA Phase), it was established that the proposed site is of low sensitivity from all aspects of archaeological heritage. No cultural heritage, buildings, structures, places of worship etc. were identified within the proposed development areas. The SAHRIS Palaeosensitivity Map indicates that the area has high sensitivity. However, the proposed intake/outlet pipelines are to be tunnelled 10–15m below sea-level from the desalination plant to beyond the surf zone in the ocean. For the rest of their length thereafter the pipelines will be aligned on the sea-bed. Consequently, impacts on the sensitive foreshore are minimised.

1.6. How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?

Answer: As explained in Chapter 2 of this EIA Report, basic services including electrical supply will need to be provided to the proposed desalination plant by the applicant.

The total energy requirement is between 4.0 and 4.5 kWh/m^3, including the costs of pumping of seawater, desalinated water and for various other processes. The recovery of energy is a critical design consideration for large seawater desalination plants because of the impact of the energy cost on the final price of water. While the average power demand is estimated to be 24.15 MW, the proposed electrical substation will be designed for a total load of 32 MW. The eThekwini Electricity has indicated that a supply at the Tongaat site would be available for the project, but require a written request from Umgeni Water for the connection, in order to do detail planning and to provide an estimated costing. This will be undertaken subsequent to the issuing of an Environmental Authorisation (should such an authorisation be granted by the proposed project).

There are currently no alternative energy generation plants in the near vicinity of the proposed desalination plant site. The only successful alternative energy plants operated in the eThekwini municipal area are those generating energy from the burning of natural gas at waste sites but these are located a significant distance from the proposed desalination plant site and can only feed into their surrounding local grid. Feasibility studies to investigate the potential to offset the carbon footprint of the desalination plant by supplementing electrical supply through renewable should be investigated at a later stage by Umgeni Water.

1.7. How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?

1.7.1. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)?

1.7.2. Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources for the proposed development alternative?).

1.7.3. Do the proposed location, type and scale of development promote a reduced dependency on resources?

Answer: The proposed project will make use of sea water, which will be abstracted from the ocean, to undertake desalination in order to produce potable water. Sea water is required for the desalination process. As noted in Chapter 2 of this EIA Report, the overall output of the treatment 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).

A detailed Marine Ecology Assessment (Chapter 6) has been undertaken as part of the EIA Phase to assess the impact that the proposed project will have on the surrounding marine ecological environment and to consider the use of the sea water on the integrity of the ocean. The specialist study on Marine Ecology has provided detailed mitigation measures and recommendations that should be adopted to minimise negative impacts on the surrounding marine environment. The negative impacts identified in the specialist study are unavoidable, however, considering the mitigation measures inherent to the design and the additional mitigation measures provided by the specialists, the overall impact of the proposed project on the surrounding ecology is anticipated to be of very low to medium significance.

It is important to note that there is no anticipated negative impact on Municipal infrastructure planning (i.e. there will be no clash of priority development areas) as additional infrastructure required to maintain the proposed activity would be provided and maintained by the applicant.

The importance of carefully considering the opportunity costs of allocating resources/funding to the project versus other alternative water supply projects has been made clear in the economic assessment (Chapter 12). The demand for water, on the North Coast, will increase to greater than the assured supply of water within the next five years. Umgeni Water is investigating two technically viable options for augmenting this region with bulk water. The East Coast Desalination Plant and the uMkhomazi Water Project which would include a dam on the uMkhomazi River, a 30km tunnel to Baynesfield, a 600Ml/d water treatment plant and large diameter pipelines to connect this system to the current bulk supply network. This scheme would have its own environmental challenges. The actual assessment and decision-making around allocation of resources to projects takes place as part of the overall water supply planning process and not as part of the project specific EIA for one of the water supply project under consideration for the area (i.e. desalination).

1.8. How were a risk-averse and cautious approach applied in terms of ecological impacts?

1.8.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?

1.8.2. What is the level of risk associated with the limits of current knowledge?

1.8.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?

Answer: A cautious approach was followed in terms of ecological impacts, whereby listed activities in GN R544, R545 and R546 were identified based on the precautionary principle. If the activity potentially forms part of the project, it has been listed in the EIA Application Form. However, the final project description will be shaped by the findings of the EIA Process and certain activities may be added or removed from the project proposal. The DEA will be informed in writing of such amendments and I&APs will also be informed accordingly.

A detailed Marine Ecology Assessment (Chapter 6), Terrestrial Ecology Assessment (Chapter 7) and a Freshwater Ecology Assessment (Chapter 8) have been undertaken as part of the EIA Phase. These specialist assessments have each assessed the impact that the proposed project will have on the surrounding marine ecology, terrestrial ecology and aquatic ecology. The specialist studies note the gaps, limits in current knowledge and assumptions that the assessments are based on.

1.9. How will the ecological impacts resulting from this development impact on people's environmental right in terms of the following:

1.9.1. Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?

1.9.2. Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?

Answer: As noted above, a detailed Marine Ecology Assessment (Chapter 6), Terrestrial Ecology Assessment (Chapter 7), Freshwater Ecology Assessment (Chapter 8), Noise Impact Assessment (Chapter 9), Visual Impact Assessment (Chapter 10) and Socio-Economic Assessment (Chapters 11 and 12) have been undertaken as part of the EIA Phase. These specialist assessments have assessed the impact that the proposed project will have on the surrounding biophysical and socio-economic environment. The specialist studies have provided detailed mitigation measures and recommendations that should be adopted to minimise negative impacts on the surrounding ecological environment. The negative impacts identified in the specialist studies are unavoidable, however, considering the mitigation measures inherent to the design and the additional mitigation measures provided by the specialists, the overall impact of the proposed project on the surrounding ecology is expected to be of very low to medium significance, with the exception of a high visual impact associated with construction activities as well as the emotional impact due to permanent loss of land and housing. The positive impacts generated by the project are associated with the economic benefits from employment opportunities, knowledge gained from conservation of potential fossil finds and the fact that the proposed facility is largely compatible with relevant water supply planning. Of high significance is the positive benefit that the proposed project would bring to alleviating serious water shortages in the study area and surrounding regions, in particular given increased variability in rainfall as a result of climate change. Recommendations to enhance positive impacts have also been provided in the relevant specialist studies.

1.10. Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?

Answer: As noted above, a detailed Socio-Economic Assessment (Chapters 11 and 12) has been undertaken as part of the EIA Phase to assess the impact that the proposed project will have on the surrounding socio-economic environment. The specialist study has provided detailed mitigation measures and recommendations that should be adopted to minimise negative impacts, as well as recommendations to enhance positive impacts. Furthermore, there will be no impact on people's health apart from potential improvements in health related to increased development opportunity in the form of infrastructure such as services or healthcare.

1.11. Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?

Answer: As noted above, a detailed Socio-Economic Assessment (Chapter 12) has been undertaken as part of the EIA Phase to assess the impact that the proposed project will have on the surrounding socio-economic environment. The specialist study has provided detailed mitigation measures and recommendations that should be adopted to minimise negative impacts, as well as recommendations to enhance positive impacts. Furthermore, there will be no impact on people's health apart from potential improvements in health related to increased development opportunity in the form of infrastructure such as services or healthcare as well as the benefit to the community in general through increased levels of water service.

Given that terrestrial supply of water is reaching its limits (many catchments are already overdeveloped), the provision of desalinated water would allow a decrease in the amount of riverine water extracted, leading to more freshwater being available to maintain ecological function of rivers and estuaries. The positive and negative impacts of the proposed project have been assessed as part of the various specialist studies and management actions recommended. With the implementation of the recommended management actions, the overall impact of the proposed project on the surrounding ecology is expected to be of very low to medium significance. Recommendations to enhance positive impacts have also been provided in the relevant specialist studies.

1.12. Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?

Answer: As highlighted in Chapter 2 of this EIA Report, 5 potential site locations between Durban and Balito were assessed in terms of ecological and social sensitivity to the receiving marine and terrestrial environments, as well as project technical requirements. Based on the findings of the multi-criteria analysis, one site at Tongaat was selected and assessed in this EIA.

The no-go alternative has also been assessed in the EIA Phase, and it assumes that the project does not go ahead.

In terms of layout alternatives, four potential sites for the sea water pump station were considered during the feasibility study. Of these, only one falls within the overall footprint impact area of the desalination and coincides with the launch pit for the tunnels to sea. These are described in detail in Chapter 2 of this EIA Report.

The above location alternatives have been assessed as part of the screening study and resulted in the selection of the "best practicable environmental option" in terms of ecological considerations (i.e. the specialists recommended which is the most favourable alternative in terms of their respective assessments). 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 sea water 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.

1.13. Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?

Answer: From a site location perspective, the proposed desalination facility site should not result in unacceptable cumulative environmental impacts. The potential cumulative impacts resulting from the proposed project are discussed in the respective specialist studies. Of greater concern was the cumulative impacts of the brine discharge into the sea and potentially impacting the water quality of the region. However, based on detailed hydrodynamic modelling conducted to date (taking into consideration prevailing salinities and current regime), the impacts are expected to be local and only in the immediate vicinity of the diffuser.

2.1. What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?

2.1.1. The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area.

2.1.2. Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.).

2.1.3. Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and

2.1.4. Municipal Economic Development Strategy ("LED Strategy").

Answer: As noted above, the draft IDP (2017/22) of the eThekwini Municipality identifies the provision of adequate water supply as one of the key development challenges in the Municipality, thus indicating that the proposed desalination development is well within the scope of the IDP. With respect to the iLembe District which will receive 50% of the water from the scheme, the IDP (2017/22) identifies aged water and sanitation infrastructure as a key challenge. Parts of the proposed potable water pipeline and powerline would cross D'MOSS area. This system has been designed to ensure a sustained supply of ecosystem goods and services that are needed to ensure a high quality of life for all residents in the region. However, sugarcane agriculture is predominant in the area and, according to the Framework Planning Branch of eThekwini Municipality.

Broad planning guidance for the site indicates that it has been earmarked for residential development in the future although it is currently used for agricultural purposes. This does not mean that strictly only residential development should take place on the site. It does, however, call for clear justifications for proposals for the site that do not entail residential development. One could argue that the supply of water for residential and other purposes would qualify as a reasonable justification in this regard. In essence, this is what eThekwini Municipality's Framework Planning Branch have done in their comments submitted to the EIA process where they raise no objections to the plant from a planning perspective given the potential for it to resolve water shortages in the Northern area of the Municipality.

Furthermore, not only is the desalination of sea water a national strategy as outlined in the DWAF: Water for Growth and Development Framework, the proposed Tongaat desalination plant forms part of an international agenda that has been recognised by the United Nations (as indicated in UNEP resource and guidance manual for environmental impact assessment of desalination projects) that has realised the importance of the development of sustainable desalination facilities that offer planners and governments in arid regions a viable opportunity to respond to both population growth and the effects of climate change.

2.2. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?

2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?

Answer: As noted above, the draft IDP (2017/22) of the eThekwini Municipality identifies the provision of adequate water supply as one of the key development challenges in the Municipality, thus indicating that the proposed desalination development is well within the scope of the IDP. With respect to the iLembe District which will receive 50% of the water from the scheme, the IDP (2015) identifies aged water and sanitation infrastructure as a key challenge. Parts of the proposed potable water pipeline and powerline would cross a D'MOSS area. This system has been designed to ensure a sustained supply of ecosystem goods and services that are needed to ensure a high quality of life for all residents in the region. However, sugarcane agriculture is predominant in the area and, according to the Framework Planning Branch of eThekwini Municipality.

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2.3. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?

Answer: As noted above, a detailed Socio-Economic Assessment (Chapters 11 and 12) has been undertaken as part of the EIA Phase to assess the impact that the proposed project will have on the surrounding socio-economic environment. The specialist studies have provided mitigation measures and recommendations that should be adopted to minimise negative impacts, as well as recommendations to enhance positive impacts, which are detailed in Chapters 11 and 12 of this EIA Report. Desalinated water will ensure a more reliable supply to communities and towns, helping to improve the quality of life.

2.4. Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?

Answer: Desalinated water will ensure a more reliable supply to communities and towns, helping to improve the quality of life. The demand for water, on the North Coast, will increase to greater than the assured supply of water within the next five to ten years. Umgeni Water is investigating two technically viable options for augmenting this region with bulk water. The East Coast Desalination Plant and the uMkhomazi Water Project which would include a dam on the uMkhomazi River, a 30km tunnel to Baynesfield, a large water treatment plant and connecting pipelines. This scheme would have its own environmental challenges.

With adequate mitigation, clear reasons to suspect that the project would be totally unsustainable were not found. It is also worth bearing in mind that this question is best considered when comparing different water supply options to desalination which is beyond the scope of a project specific EIA.

2.5. In terms of location, describe how the placement of the proposed development will:

2.5.1. result in the creation of residential and employment opportunities in close proximity to or integrated with each other,

2.5.2. reduce the need for transport of people and goods,

2.5.3. result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),

2.5.4. compliment other uses in the area,

2.5.5. be in line with the planning for the area,

2.5.6. for urban related development, make use of underutilised land available with the urban edge,

2.5.7. optimise the use of existing resources and infrastructure,

2.5.8. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),

2.5.9. discourage "urban sprawl" and contribute to compaction/densification,

2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,

2.5.11. encourage environmentally sustainable land development practices and processes,

2.5.12. take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),

2.5.13. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),

2.5.14. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and

2.5.15. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?

Answer: All data and feasibility studies thus far have indicated that water demand will exceed supply in the near future and the desalination of sea water could potentially be the most feasible and viable alternative supply source (also considering that all private and commercial activities are strongly dependent on water in the region). Furthermore, the site screening study undertaken by Umgeni Water initially investigated five potential sites on the KZN North Coast for the possible implementation of the desalination facility. Based on various environmental and social screening criteria (as highlighted in Chapter 2 of this EIA Report), it was concluded that the Tongaat site on the KZN North Coast was the most favourable. Further details on benefits to the area are included in the social and economic studies (Chapters 11 and 12 of this EIA Report). The positive impacts generated by the project are associated with the economic benefits from employment opportunities, knowledge gained from conservation of potential fossil finds and the fact that the proposed facility is largely compatible with relevant water supply planning. Of high significance is the positive benefit that the proposed project would bring to alleviating serious water shortages in the study area and surrounding regions, in particular given increased variability in rainfall as a result of climate change.

2.6. How were a risk-averse and cautious approach applied in terms of socio-economic impacts?

2.6.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?

2.6.2. What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?

2.6.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?

Answer: A cautious approach was followed throughout the impact assessment, whereby listed activities in GN R544, R545 and R546 were identified based on the precautionary principle. If the activity potentially forms part of the project, it has been listed in the EIA Application Form. However, the final project description will be shaped by the findings of the EIA Process and certain activities may be added

or removed from the project proposal. The DEA will be informed in writing of such amendments and I&APs will also be informed accordingly.

As noted above, a detailed Social and Economic Assessment (Chapters 11 and 12) has been undertaken as part of the EIA Phase to assess the impact that the proposed project will have on the surrounding socio-economic environment. The specialist studies have provided mitigation measures and recommendations that should be adopted to minimise negative impacts, as well as recommendations to enhance positive impacts, which are detailed in Chapters 11 and 12 of this EIA Report. The specialist study notes the gaps, limits in current knowledge and assumptions that the assessments are based on.

2.7. How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:

2.7.1. Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?

2.7.2. Positive impacts. What measures were taken to enhance positive impacts?

Answer: As noted above, a detailed Social and Economic Assessment (Chapters 11 and 12) has been undertaken as part of the EIA Phase to assess the impact that the proposed project will have on the surrounding socio-economic environment. The specialist studies have provided mitigation measures and recommendations that should be adopted to minimise negative impacts, as well as recommendations to enhance positive impacts, which are detailed in Chapters 11 and 12 of this EIA Report. The specialist study notes the gaps, limits in current knowledge and assumptions that the assessments are based on.

2.8. Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?

Answer: As noted above, a detailed Social and Economic Assessment (Chapters 11 and 12) has been undertaken as part of the EIA Phase to assess the impact that the proposed project will have on the surrounding socio-economic environment. The specialist studies have provided mitigation measures and recommendations that should be adopted to minimise negative impacts, as well as recommendations to enhance positive impacts. Furthermore, there will be no impact on people's health apart from potential improvements in health related to increased development opportunity in the form of infrastructure such as services or healthcare.

2.9. What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?

Answer: As highlighted in Chapter 2 of this EIA Report, 5 potential site locations between Durban and Ballito were assessed in terms of ecological and social sensitivity to the receiving marine and terrestrial environments, as well as project technical requirements. Based on the findings of the multi-criteria analysis, one site at Tongaat was selected and assessed as part of this EIA.

The no-go alternative has also been assessed in the EIA Phase, and it assumes that the project does not go ahead.

In terms of layout alternatives, four potential sites for the sea water pump station were considered during the feasibility study. Of these, only one falls within the overall footprint impact area of the desalination and coincides with the launch pit for the tunnels to sea. These are described in detail in Chapter 2 of this EIA Report.

The above location alternatives have been assessed as part of the screening study and resulted in the selection of the "best practicable environmental option" in terms of ecological considerations (i.e. the specialists recommended which is the most favourable alternative in terms of their respective assessments). 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 sea water 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.

2.10. What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?

Answer: Refer to the answer provided to 2.9 above.

2.11. What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?

Answer: Refer to the answer provided to 2.9 above.

2.12. What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?

Answer: An EIA is being undertaken, which assesses the environmental and socio-economic impacts of the proposed project. The EMPr (Part B of this EIA Report) provides recommendations and management actions for all aspects of the project lifecycle, which will become legally binding to the Applicant, should an Environmental Authorisation be granted by the DEA. The EMPr also includes monitoring frequency and monitoring responsibility. The EIA Process ensures that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the life cycle of the proposed project.

2.13. What measures were taken to:

2.13.1. ensure the participation of all interested and affected parties,

2.13.2. provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,

2.13.3. ensure participation by vulnerable and disadvantaged persons,

2.13.4. promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,

2.13.5. ensure openness and transparency, and access to information in terms of the process,

2.13.6. ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and

2.13.7. ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were being promoted?

Answer: As noted above, an EIA is required for the proposed project in terms of the 2010 NEMA EIA Regulations. The EIA Process includes a thorough and rigorous Public Participation Process. The Public Participation Process that was undertaken during the Scoping Phase and is being undertaken during this EIA Phase is in compliance with the 2010 EIA Regulations, and is described in Chapter 4 of this EIA Report, as applicable. The aim of the Public Participation Process is to ensure the participation of all I&APs, and provide all I&APs (including vulnerable and disadvantaged persons) with a fair, transparent process that allows I&APs to participate fairly.

2.14. Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?

Answer: There is a medium term need for an alternative water source on the North Coast. Two viable alternatives exist to address this need and the development of the proposed desalination plant in the Tongaat region is one of these. It is of the utmost importance to all residents and commercial activities in the area that one of the options be implemented. In summary, there is little doubt that the community/area is in need of both the activity and the associated land-use.

Sourcing of labour will also be done according to the expanded public works programme (EPWP) Umgeni applies, which includes requirements for promoting use of local labour and broad-based black economic empowerment.

2.15. What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?

Answer: Mitigation measures and management actions to reduce negative environmental impacts, as well as those impacts on the surrounding communities, noise sensitive areas and construction workers have been included in the EMPr (Part B of the EIA Report). Awareness training and on the job training have been included as part of the EMPr and will be the responsibility of the construction contractor as well as the proponent. Appropriate contracts will also be put in place for each worker. An environmental awareness is undertaken by the ECO/ESO for construction workers before commencement of construction work where workers are advised of project specific activities that impact on the environmental and appropriate mitigation measures to implement. Each project is also assigned a safety and health official to cater for aspects of project specific activities affecting public health and safety.

It is important to note that there will be no impact on people's health apart from potential improvements in health related to increased development opportunity in the form of infrastructure such as services or healthcare. It is anticipated that noise will be generated from the establishment of site construction areas and during the construction phase from construction equipment and vehicles. Noise is also expected to be generated during the operational phase. A Noise Impact Assessment specialist study has been undertaken as part of the EIA and is included in Chapter 9 of this EIA Report. Results of the study showed that the residents will not be impacted significantly by noise generated at the proposed desalination plant site (i.e. during the operational phase). However, there may be some noise impact in the immediate area surrounding the proposed site during the construction phase. Recommendations have been provided to mitigate the potential noise impacts. These include operational management techniques to minimise impact as well as physical design considerations.

2.16. Describe how the development will impact on job creation in terms of, amongst other aspects:

2.16.1. the number of temporary versus permanent jobs that will be created,

2.16.2. whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),

2.16.3. the distance from where labourers will have to travel,

2.16.4. the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and

2.16.5. the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).

Answer: Construction activities are anticipated to last for approximately 30 months and will only occur during the day, except in case of emergencies. The total number of construction workers is still to be assessed according to the typical South African standard of construction. The average workforce during the estimated 30 months construction phase is approximately 300 workers (at peak times). The workforce would be sourced locally where possible, however, it is likely that some of the semi-skilled workforce would come from outside the immediate vicinity. Sourcing of labour will be done according to the expanded public works programme (EPWP) Umgeni applies, which includes requirements for promoting use of local labour and broad-based black economic empowerment. Operation of the desalination plant would require approximately 30 employees working over two shifts of 8 hours per day.

Economic spin offs are also expected to be created during the construction and operational phase. Refer to the Social and Economic Assessment studies (Chapters 11 and 12), which have been undertaken as part of the EIA Phase, for additional information regarding employment opportunities.

2.17. What measures were taken to ensure:

2.17.1. that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and

2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?

Answer: Chapter 4 of this EIA Report highlights the legislation and policies that are applicable to the proposed project. The EIA Process includes a thorough and rigorous Public Participation Process. The Public Participation Process is in compliance with the 2010 EIA Regulations, and is described in Chapter 4 of this EIA Report. The aim of the Public Participation Process is to ensure the participation of all I&APs, and provide all I&APs and organs of state with a fair, transparent process that allows I&APs to participate fairly.

2.18. What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?

Answer: An EIA is being undertaken as required in terms of the 2010 NEMA EIA Regulations. The EIA Process will ensure that the environment will be protected. Furthermore, the EMPr (Part B of this EIA Report) provides recommendations and management actions for all aspects of the project lifecycle, which will become legally binding to the Applicant, should an Environmental Authorisation be granted by the DEA. The EMPr also includes monitoring frequency and monitoring responsibility.

2.19. Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?

Answer: An EIA is being undertaken as required in terms of the 2010 NEMA EIA Regulations. The EIA Process will ensure that the environment will be protected. Furthermore, the EMPr (Part B of this EIA Report) provides recommendations and realistic mitigation measures and management actions (proposed by the specialists and the EAP) for all aspects of the project lifecycle. The EMPr also includes monitoring frequency and monitoring responsibility. Refer to Chapter 14 (Conclusions and Recommendations) of this EIA Report for a description of the residual negative impacts and associated mitigation measures.

Although decommissioning must be considered as a possibility, the probability of the plant being decommissioned is near zero. The intention would be to manage the plant indefinitely and to upgrade components of the plant as and when required. Once commissioned the plant would form an integral part of the supply system for the South Coast and as such will be needed for future supply to the area. Seawater desalination technologies will improve with time and it is possible that components of the scheme may be replaced (mostly internal process components) as these technologies improve. However, it is extremely unlikely that the plant will be decommissioned in totality.

2.20. What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid for by those responsible for harming the environment?

Answer: The EMPr (Part B of this EIA Report) provides recommendations and management actions (including monitoring frequency and monitoring responsibility) for all aspects of the project lifecycle, which will become legally binding to the Applicant, should an Environmental Authorisation be granted by the DEA. The EMPr ensures that rehabilitation will be undertaken when required and that any pollution, environmental degradation and resulting adverse health effects will be remedied by the Applicant or the polluter.

2.21. Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?

Answer: Refer to the answer provided to 2.9 above.

2.22. Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?

Answer: Refer to the Social and Economic Assessments (Chapters 11 and 12), which have been undertaken as part of the EIA Phase, for additional information regarding positive and negative cumulative socio-economic impacts.

Additional information regarding the project need and site selection process is provided in Chapter 2 of this EIA Report.

1.5.1. Project financing

Umgeni Water currently has a CAPEX which exceeds R5 billion. The organisation implements large scale projects and funds them off balance sheet or through the raising of capital loans. The total capital cost for the proposed project is estimated at approximately 4.4 billion (cost as of July 2015) and it would be no different to any other CAPEX project which Umgeni Water were to implement. There are two options for funding the proposed project. Either Umgeni Water would raise the capital needed for the project itself and fund the contract or it will enter into a Public Private Partnership with an external contracting company (who would provide the capital funding and construct the plant) and then enter into a tariff agreement with the PPP enterprise. Umgeni Water will decide on the institutional arrangement when / if the project goes to construction. Umgeni Water has a very competent finance department to manage its finances and prepare budgets. Extensive financial planning of the scheme has been undertaken with impacts on tariffs and expected debt repayments being determined.

As part of the project feasibility study, Aurecon has estimated that an indicative water tariff of R13.45/m^3 would be required to cover the capital and operational cost of the project (Aurecon, 2015).

1.6. REQUIREMENTS FOR AN EIA

As noted above, in terms of the EIA Regulations promulgated under Chapter 5 of the NEMA published in GN R543, R544, R545 and R546 on 18 June 2010 and enforced on 2 August 2010, a full Scoping and EIA Process is required for the proposed project. The need for the full Scoping and EIA is triggered by, amongst others, the inclusion of Activity 14 listed in GN R545 (Listing Notice 2):

> *a) "The construction of an island, anchored platform or any other permanent structure on or along the sea bed excluding construction of facilities, infrastructure or structures for aquaculture purposes".*

Chapter 4 of this EIA Report contains the detailed list of activities contained in GN R544, 545 and 546 which may be triggered by the various project components and thus form part of this Scoping and EIA Process. These listed activities require authorisation from the relevant authority, which in this instance is the National Department of Environmental Affairs (DEA). The purpose of the EIA is to identify, assess and report on any potential impacts the proposed project, if implemented, may have on the receiving environment. The environmental assessment therefore needs to show the responsible authority, the DEA; and the project proponent, Umgeni Water, what the consequences of their choices will be in terms of impacts on the biophysical and socio-economic environment and how such impacts can be as far as possible enhanced or mitigated and managed as the case may be.

It is important to note that the Application for Environmental Authorisation was lodged with the National DEA and accepted prior to the promulgation of the new EIA Regulations, which were published on 4 December 2014 (in GN R982, R983, R984, and R 985). The Transitional Arrangements included in the 2014 EIA Regulations allow for the original Application for Environmental to continue to be assessed in terms of the 2010 EIA Regulations, as a decision is still pending and the process commenced prior to 4 December 2014. However, for purposes of completeness, the applicable and relevant listed activities included in the 2014 EIA Regulations have been described in this EIA Process. Additional information regarding the applicable listed activities is provided in Chapter 4 of this EIA Report.

On the international agenda, the International Finance Corporation (IFC), a component of the World Bank Group, has developed operational policies (IFC 1998) that require that an impact assessment is undertaken within the country's overall policy framework and national legislation, as well as international treaties, and that natural and social aspects are to be considered in an integrated way. The IFC has further published Environmental, Health, and Safety Guidelines (known as the 'EHS

Guidelines') containing guidelines and standards applicable to projects discharging industrial wastewater (IFC 2007). The EHS Guidelines contain the performance levels and measures that are normally acceptable to the IFC and are generally considered to be achievable in new facilities at reasonable costs by existing technology.

The EHS Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in IFC's Performance Standard 3 on Pollution Prevention and Abatement (IFC 2006). This Performance Standard has the objective of avoiding and minimising adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. It outlines a project approach to pollution prevention and abatement in line with internationally disseminated pollution prevention and control technologies and practices. In addition, Performance Standard 3 promotes the private sector's ability to integrate such technologies and practices as far as their use is technically and financially feasible and cost-effective in the context of a project that relies on commercially available skills and resources.

1.7. EIA TEAM

As noted above, the CSIR has been appointed by Umgeni Water to undertake the EIA required for the proposed project. The EIA team which is involved in the Scoping and full EIA Process is listed in Table 1.4 below. This team includes the names of a number of specialists which have either been involved to date, or are planned to provide inputs during the EIA Process. CVs and Declaration of Independence for all specialists are included in Appendix A of this report.

Table 1-4: EIA Team

EIA MANAGEMENT TEAM		
Paul Lochner	CSIR	Project leader and Technical Reviewer (EAPSA) Certified
Annick Walsdorff	CSIR	Project Manager
Rohaida Abed	CSIR	Project Team
SPECIALIST TEAM		
Dr Andrea Pulfrich	Pisces Environmental Services	Marine Ecology Assessment
Simon Bundy	Sustainable Project Developments cc	Terrestrial Ecology Assessment
Dr Liz Day	The Freshwater Consulting Group	Freshwater Ecology Assessment
Dr Brett Williams	Safetech	Noise Impact Assessment
Henry Holland	MapThis Trust	Visual Impact Assessment
Dr Hugo van Zyl	Independent Economic Researchers	Economic Assessment
Duncan Kael	ACER Africa	Social Impact Assessment
Len van Schalkwyk	eThembeni Cultural Heritage	Heritage Assessment: Letter for Exemption

1.8. DETAILS AND EXPERTISE OF THE EAP

Over the past 30 years the CSIR has been involved in a multitude of projects across Africa and South Africa, with experience in 32 sub-Saharan African and Indian Ocean Island countries. The CSIR has been involved in the management and execution of numerous environmental projects and programmes for a range of both public and private sector clients and as a result CSIR staff offer a wealth of experience and appreciation of the environmental and social priorities and national policies and regulations in South Africa. A summary of the CSIR's relevant project experience for the purposes of the proposed Tongaat desalination EIA is presented in Table 1-5.

The EIA Project Team is being led by Mr Paul Lochner (refer to Appendix A for the EAPs CV), who is supported by a CSIR Project Manager, Annick Walsdorff.

Paul Lochner - Paul (EAPSA certified) is the Manager of the Environmental Management Services (EMS) division of the CSIR and will act as Technical Reviewer for the proposed Tongaat desalination plant. Paul has over 25 years' experience in successfully managing large, complex environmental studies, many of which required extensive stakeholder engagement, and the coordination and integration of specialist studies across the spheres of the biophysical, social and economic components of the environment. Of particular relevance to this proposed project is that in 2012, he was project leader for the EIA for the Saldanha Desalination Plant. In 2009, he also acted as project leader for the EIA for the NamWaterDesalination Plant north of Swakopmund, Namibia. He was the project leader for the EIA for the marine pipelines for the Coega IDZ (these intake and discharge pipelines could potentially service a desalination plant in the IDZ). He also managed a study that investigated the potential for using RO to provide industrial quality water for a proposed aluminium smelter within the Coega IDZ. In South Africa, in recognition of his role as a leader in the field of environmental assessment and management, he has been appointed by national and provincial government to author various environmental guidelines. For example, he was lead author of the "Overview of IEM" information document published in 2004 by the South African national DEAT as part of the IEM Series; as well as being author of the "Guideline for EMPs" published by the Western Cape government in 2005.

Annick Walsdorff - Annick is an Environmental Assessment Practitioner in the Environmental Management Services group of the CSIR. She holds a MSc in Chemical Engineering from the University of Stellenbosch. She has more than 15 years' experience in environmental assessment and management and has recently been involved in several environmental studies of national importance including Preliminary Environmental Assessments, EIAs and Environmental Management Plans (EMPs). Annick was also a member of the team who undertook the EIA on behalf of NamWater for the proposed desalination plant in Swakopmund.

Rohaida Abed - Rohaida Abed is an EAP in the EMS group of the CSIR, based in Durban. She holds a MSc Degree in Environmental Science from the University of KwaZulu-Natal. She has eight years of experience in the Environmental Management field, and has been involved in various transport infrastructure related projects as an Environmental Control Officer. She has also been involved in Basic Assessments (BAs) and EIAs relating to Port infrastructure and Bulk Liquid Storage facilities in the capacity of Project Manager, including the OTGC Ngqura Tank Farm EIA, Transnet Port of Ngqura Landside BA, Transnet Saltworks Demolition BA, Transnet Marine Infrastructure EIA, and the OTGC Maydon Wharf Storage Terminal BA and Environmental Authorisation Amendment Processes in KwaZulu-Natal. She has worked on EIAs and BAs for Renewable Energy Projects and she is part of the Phased Gas Pipeline and EGI expansion SEA team that is currently underway for the DEA, DPE, DOE, iGas, Transnet and Eskom. She is a registered Professional Natural Scientist (400247/14) with the South African Council for Natural Scientific Professions (SACNASP).

Table 1-5: Summary of CSIR's relevant project experience for the purposes of the Tongaat desalination EIA.

Project title and location	Client	Date
Environmental feasibility (screening) study for the proposed city of Cape Town 450 Mℓ per day desalination plant	City of Cape Town	2014
EIA for the proposed 25.5 Ml/day Saldanha Desalination Facility in Western Cape	West Coast District Municipality	2012
BA for a biomass power plant near Mkuze, KZN	Electrawinds	2012
Environmental Sensitivity Study for the proposed development of Pier 1 Phase 2 container terminal in the Port of Durban, KZN	Transnet Capital Projects	2011
EIA and EMP for a desalination plant at Mile 6 near Swakopmund	NamWater	2009
EIA for all marine mining operations (and associated land-based infrastructure)	Namdeb/De Beers Marine Namibia	2007
Environmental Screening Study and EIA for the proposed Manganese export terminal at the Port of Ngqura, Coega	Transnet/NPA	2007- 2014
EIA for the proposed Coega LNG-to-Power Project at the Port of Ngqura, Coega	Eskom and iGas	2007- (ongoing)
EIA for the expansion of the container terminal and construction of the administration craft basin at the Port of Ngqura, Coega, RSA	Transnet/NPA	2006 – 2007
Regional Oil Spill Planning In The BCLME Region (Project Behp/Oscp/03/01), for South Africa, Namibia, Angola	GEF (managed by UNOPS)	2004 - 2007
EIA and EMP for the Coega Aluminium Smelter, near Port Elizabeth, RSA	Pechiney (France) and Alcan (Canada)	2002 – 2007
Environmental management programme report (EMPR) for the development of the Kudu Gas Field on the continental shelf of Namibia	Energy Africa	2006
Study on the sedimentation of the small-craft harbour at Saldanha, Namibia	NamPort	2005
Guideline for EMPs for the Western Cape province	DEA&DP, Western Cape	2005
Environmental baseline description for Angola LNG EIA	ChevronTexaco (now Chevron)	2005
Kudu Power Plant EIA, Oranjemund, Namibia	NamPower	2005
EIA of seismic surveys in the Luderitz Licence Area	Hunt Oil Company	2005

Project title and location	Client	Date
Environmental Site Selection Study for the proposed Manganese Smelter Project, RSA	Asian Minerals Ltd	2004
Site Selection Process for the Angola LNG Project, Soyo, Angola.	ChevronTexaco	2003
Risk Assessment of potential impacts of industrial emissions on the Abalone Farm at Coega (Confidential), incl. oil spill modelling, RSA	CDC and NPA	2003
Environmental Due Diligence for Angola LNG project (Luanda and Soyo sites)	ChevronTexaco (now Chevron)	2001-2003
Environmental Due Diligence (EDD) for four of the SFF Association's strategic oil storage facilities in South Africa	SFF Association's	2001
EIA for the Kudu Gas Field Development Project, Namibia	Shell Exploration and Production Namibia B.V.	1998
EIA for Crude Oil Transfer and Storage at Saldanha Bay (incl. risk assessment and oil spill modelling), RSA	SFF Association (now part of PetroSA)	1997

1.9. OBJECTIVES OF THIS DRAFT EIA REPORT

The EIA Process was preceded by a comprehensive Scoping Process that led to the submission of a Final Scoping Report (and Plan of study for the EIA) to the DEA for approval on 15 May 2015. Approval was received on 17 June 2015 which marked the end of the Scoping Phase (Appendix C), after which the EIA Process moved into the impact assessment and reporting phase. For background on the Scoping Process, the reader is referred to the Final Scoping Report (CSIR, 2015). The Final EIA report was released in June 2016 for decision-making.

In its letter dated September 2016 (refer to Appendix C), the DEA rejected the Final EIA report and requested that the following additional information be submitted and that the EIA report be amended:

1) Detailed motivation on why other alternative sites within the Tongaat area were not assessed.
2) Re-alignment of the proposed powerline to avoid King Shaka Conservation Area and re-alignment of the proposed potable water pipeline from La-Mercy Reservoir to Waterloo Reservoir to avoid the Northern Wetland Offset Framework.
3) Inclusion of a wetland offset plan as part of the EIA report.
4) Confirmation from eThekwini Municipality that the Municipality has capacity to provide electricity to the proposed development.

In addition, on 10th August 2016, Umgeni has received a correspondence from Mr Shrivaar Singh stating that the location of the proposed potable rising main and servitude traverse Erf 36/776 which is an area that is supposedly approved for the development of upmarket housing due to be constructed in 2017. This section of the potable water pipeline was therefore re-routed to avoid the proposed housing development.

As such the amended potable water pipeline and powerline routes have been assessed in this 2nd Draft EIA report and are presented to the public and the competent authority, the DEA, with an overview of the predicted impacts and associated management actions required to avoid or mitigate the negative impacts; or to enhance the benefits of the proposed project. Details on the assessment of the original preferred and alternative routes can be found in the Final EIA report dated June 2016.

In terms of legal requirements, a crucial objective of the EIA Report is to satisfy the requirements of Regulations 31, 32 and 33 of the NEMA EIA Regulations of 18 June 2010 which came into effect on 2 August 2010. These regulations regulate and prescribe the content of the EIA Report and specify the type of supporting information that must accompany the submission of the report to the authorities. An overview of where the requirements are addressed in this report is presented in Table 1.6.

Furthermore, this process is designed to satisfy the requirements of Regulations 55, 56 and 57 of the 2010 EIA Regulations relating to the public participation process and, specifically, the registration of Interested and Affected Parties (I&APs) and recording of submissions from I&APs. All comments on the Final Scoping Report received after the closure of the allowed commenting period are recorded and addressed in this EIA Report. All I&APs on the current database for this EIA (Appendix E) have been informed of the release of the EIA Report for a 40-day comment period. All comments received will be recorded and addressed in the EIA Report.

The EMPr that is required as part of the EIA Process (Regulation 33) is provided in Part B of this EIA Report.

Table 1-6: Summary of where requirements of an EIA Report (in terms of Sections 28 of the NEMA EIA Regulations) are provided in this EIA Report

Section	Requirement for EIA Report	Where this is provided in this EIA Report
(2) (a) (i)	The EAP who compiled the report	Chapter 1 and Appendix A
(2) (a) (ii)	The expertise of the EAP to carry out an environmental impact assessment	Chapter 1 and Appendix A
(2) (b)	A detailed description of the proposed activity	Chapter 2
(2) (c)	A description of the property on which the activity is to be undertaken and the location of the activity on the property, or if it is:	Chapter 3 (overview), with more detail in Chapters 6 to 13
(2) (c) (i)	A linear activity, a description of the route of the activity	Chapter 2, Appendix D
(2) (c) (ii)	An ocean-based activity, the coordinates where the activity is to be undertaken	Chapter 2, Appendix D
(2) (d)	A description of the environment that may be affected by the activity and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity	Chapter 3 (overview), with more detail in Chapters 6 to 13
(2) (e)	Details of the public participation process conducted in terms of sub-regulation (1), including:	Chapter 4
(2) (e) (i)	Steps undertaken in accordance with the plan of study	Chapter 4
(2) (e) (ii)	A list of persons, organisations and organs of state that were registered as interested and affected parties	Appendix E

Section	Requirement for EIA Report	Where this is provided in this EIA Report
(2) (e) (iii)	A summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments	Refer to Final Scoping Report for comments from Scoping phase. Comments received prior to the release of the EIA Report are placed in Chapter 5 of this report. Comments on the EIA Report will be included in the EIA Report.
(2) (e) (iv)	Copies of any representation, objections and comments received from registered interested and affected parties	To be included in the EIA Report. Note: Copies of correspondence received from I&APs prior to the release of the EIA Report are placed in Appendix F of this report.
(2) (f)	A description of the need and desirability of the proposed activity	Chapter 1
(2) (g)	A description of identified potential alternatives to the proposed activity, including advantages and disadvantages that the proposed activity or alternatives may have on the environment and the community that may be affected by the activity	Chapter 2
(2) (h)	An indication of the methodology used in determining the significance of potential environmental impacts	Chapter 4
(2) (i)	A description and comparative assessment of all alternatives identified during the environmental impact assessment process	Chapter 2, Chapter 4 and Chapters 6 – 13
(2) (j)	A summary of the findings and recommendations of any specialist report or report on a specialised process	Chapter 13 and Executive Summary
(2) (k)	A description of all environmental issues that were identified during the environmental impact assessment process, an assessment of the significance of each issue and an indication of the extent to which the issue could be addressed by the adoption of mitigation measures	Chapters 6 to 13
(2) (l)	An assessment of each identified potentially significant impact, including:	Chapters 6 to 13, Part B
(2) (l) (i)	Cumulative impacts	Chapters 6 to 13, Part B
(2) (l) (ii)	The nature of the impact	Chapters 6 to 13, Part B
(2) (l) (iii)	The extent and duration of the impact	Chapters 6 to 13, Part B
(2) (l) (iv)	The probability of the impact occurring	Chapters 6 to 13, Part B
(2) (l) (v)	The degree to which the impact can be reversed	Chapters 6 to 13, Part B
(2) (l) (vi)	The degree to which the impact may cause irreplaceable loss of resources	Chapters 6 to 13, Part B

Section	Requirement for EIA Report	Where this is provided in this EIA Report
(2) (l) (vii)	The degree to which the impact can be mitigated	Chapters 6 to 13, Part B
(2) (m)	A description of any assumptions, uncertainties and gaps in knowledge	Chapters 6 to 13
(2) (n)	A reasoned opinion as to whether the activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	Chapter 14
(2) (o)	An environmental impact statement which contains:	Chapter 14
(2) (o) (i)	A summary of the key findings of the environmental impact assessment	Chapter 14 and Executive Summary
(2) (o) (ii)	A comparative assessment of the positive and negative implications of the proposed activity	Chapter 14
(2) (p)	A final environmental management programme containing the aspects contemplated in regulation 33	Part B (EMPr)
(2) (q)	Copies of any specialist reports and reports on specialised processes complying with regulation 32	Included and integrated into Chapters 6 to 13, and Appendix E
(2) (r)	Any specific information that may be required by the competent authority	Refer to Table 1.5 below
(2) (s)	Any other matters required in terms of sections 24 (4) (a) and (b) of the Act	Not applicable

As noted above, the DEA approved the Final Scoping Report on 17 June 2015 (refer to letter in Appendix C). Within the approval correspondence, the DEA recommended a few requirements for the EIA Report. These requirements and recommendations, as well as the requirements from DEA following submission of the Final EIA Report are shown in Table 1.7 below.

Table 1-7: Summary of where DEA requirements (in terms of Sections 28 of the NEMA EIA Regulations) are provided in this EIA Report

DEA Requirement for EIA Report	Response from CSIR and Section in EIA Report
Final Scoping Report	
All comments and recommendations made by all stakeholders and I&APs on the Final Scoping Report, and submitted as part of the Final Scoping Report, must be taken into consideration when preparing an EIA Report in respect of the proposed development. Please ensure that all mitigation measures and recommendations in specialist studies are addressed and included in the Final EIA Report and EMPr.	Entire report, as applicable.

DEA Requirement for EIA Report	**Response from CSIR and Section in EIA Report**
Please ensure that all comments from all relevant stakeholders are submitted to the DEA with the Final EIA Report. This includes but is not limited to the KZN Department of Economic Development, Tourism, Environmental Affairs, the Department of Transport, the Department of Water and Sanitation, the Department of Agriculture, Forestry and Fisheries (DAFF), the Department of Rural Development and Land Reform, Amafa AKwaZulu-Natali, Ezemvelo KZN Wildlife, Coastwatch KZN, Eskom Holding SOC Limited, Transnet, Passenger Rail Agency of South Africa, DEA Branch Oceans and Coast, and the eThekwini Municipality. Proof of correspondence with the various stakeholders must be included in the Final EIA Report. Should you be unable to obtain comment, proof must be submitted to the DEA of the attempts that were made to obtain comments.	All comments received during the 40 day review of the Draft EIA Report as well as those received during the 20 day review of the Final EIA report have been included in this amended Report. Proof of correspondence sent to relevant stakeholders and I&APs have been included in the EIA Report. Refer to Appendix E of this EIA Report for a copy of the current I&AP database, which includes the specified stakeholders.
In addition, the following amendments and additional information is required for the EIA Report:	
a) Details of the future plans for the site and infrastructure after decommissioning and the possibility of upgrading the proposed infrastructure to more advanced technologies.	Chapter 2
b) The total footprint of the proposed development should be indicated. Exact locations of the RO plant, pipelines, roads, power lines, canals, bridges, tunnels, facilities for the storage of dangerous goods and all other associated infrastructure should be mapped at an appropriate scale.	Chapter 2 and Appendix D (Maps and Co-ordinates)
c) A clear description of all associated infrastructure. This description must include, but is not limited to the following: • Power lines; • Internal roads infrastructure; and • All supporting onsite infrastructure.	Chapter 2
d) With regards to infilling and excavation of watercourses for the construction of the RO plant, the applicant is required to provide an indication of the preferred and alternate locations from which material used for infilling will be sourced, and where excavated material will be stored and/or disposed of. In addition, the impacts associated with this activity must be assessed in the EIA Report.	Chapter 2, Chapter 14 and Part B
e) The EAP must engage the relevant provincial environmental authority with regards to development in geographic areas triggering GN R546: Activities 2, 4, 10, 12, 13, 14, 16, 19 and 24 to confirm applicability of these activities.	Chapter 4 and Appendix E
f) The EIA Report must provide an assessment of the potential impacts and proposed mitigation measures for each of the listed activities applied for.	Chapter 6 – 13 and Part B

DEA Requirement for EIA Report	**Response from CSIR and Section in EIA Report**
g) Please ensure that only the listed activities that are applicable and relevant to the proposed development are included in both the application form and the EIA Report. Should there be activities that are no longer applicable to the proposed development, the application form must be amended and resubmitted to the Department, together with the EIA Report.	Chapter 4 and Appendix B (Application Form)
h) The EIA Report must provide the corner/bend point coordinates for the proposed development site (note that if the site has numerous bend points, all bend point coordinates must be provided), as well as at the start, middle and end point of all linear activities.	Chapter 2 and Appendix B (Maps and Co-ordinates)
i) The EIA Report must provide a detailed motivation as to the need and desirability of the proposed development, as well as the specific location.	Chapter 1 and Chapter 2
j) Should a Water Use Licence be required, proof of application for a licence needs to be submitted.	Chapter 4 and Chapter 8
k) The impacts of the proposed facility on marine ecology must be assessed in the EIA Phase. Similar existing projects must be taken into consideration in the EIA Report, when assessing the potential impacts of the return brine on the marine environment.	Chapter 6 and Part B
l) The potential impacts of the proposed development on nearby natural coastal and/or dune forest(s) must be assessed, as per the correspondence from DAFF dated 16 May 2014.	Chapter 7 and Part B
m) Issues regarding the geotechnical stability of the proposed route 1 rising main pipeline must be addressed in the EIA Report, as per the eThekwini Municipality's comments dated 26 May 2014;	Chapter 2
n) Possible impacts and effects of the proposed development on the surrounding industrial, residential and holiday/tourist areas must be addressed;	Chapter 11 and Chapter 12
o) The EIA Report must include information on the following: • Environmental costs vs benefits of the reverse osmosis plant activity; and • Economic viability of the facility to the surrounding area and how the local community will benefit.	Chapter 12
p) Information on the services required on the site, e.g. sewage, refuse removal, water and electricity. Who will supply these services and has an agreement and confirmation of capacity been obtained?	Chapter 1 and Chapter 2

DEA Requirement for EIA Report	**Response from CSIR and Section in EIA Report**
q) An EMPr dealing with the construction, operation and decommissioning phases that will include mitigation and monitoring measures.	Part B
The applicant is hereby reminded to comply with the requirements of Regulation 67 with regard to the time period allowed for complying with the requirements of the Regulation, and regulations 56 and 57 with regard to the allowance of a comment period for interested and affected parties on all reports submitted to the competent authority for decision-making. The reports referred to are listed in regulation 56(3a – 3h).	Chapter 4
Please ensure that the Final EIA Report includes at least one A3 regional map of the area and the locality maps included in the Final EIA Report illustrate the different proposed alignments and above ground storage of fuel. The maps must be of acceptable quality and as a minimum, have the following attributes: • Maps are relatable to one another; • Cardinal points; • Co-ordinates; • Legible legends; • Indicate alternatives; • Latest land cover; • Vegetation types of the study area; and • A3 size locality map.	Appendix D (Maps and Co-ordinates)
Furthermore, it must be reiterated that, should an application for Environmental Authorisation be subject to the provisions of Chapter 2, Section 38 of the National Heritage Resources Act, Act 25 of 1999, then this Department will not be able to make nor issue a decision on terms of your application for Environmental Authorisation pending a letter from the pertinent heritage authority categorically stating that the application fulfils the requirements of the relevant heritage resources authority as described in Chapter 2, Section 38 (8) of the National Heritage Resources Act, Act 25 of 1999.	Chapter 4 and 13
Final EIA Report	
Detailed motivation on why other alternative sites within the Tongaat area were not assessed.	Chapter 2, Section 2.3 and 2.6
Re-alignment of the proposed powerline to avoid King Shaka Conservation Area and re-alignment of the proposed potable water pipeline from La-Mercy Reservoir to Waterloo Reservoir to avoid the Northern Wetland Offset Framework.	Entire report
Inclusion of a wetland offset plan as part of the EIA report.	Chapter 8
Confirmation from eThekwini Municipality that the Municipality has capacity to provide electricity to the proposed development.	Appendix G