

# **ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF THE RICHARDS BAY COMBINED CYCLE POWER PLANT (CCPP) AND ASSOCIATED INFRASTRUCTURE ON A SITE NEAR RICHARDS BAY, KWAZULU-NATAL PROVINCE**

## **Socio-Economic Impact Assessment**

### **Draft Report**

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**Prepared for:**



Savannah Environmental Pty Ltd  
5 Woodlands Drive Office Park,  
Woodlands Drive, Gauteng  
Tel: +27 (0)11 656 3237  
Fax: +27 (0)86 684 0547  
E-mail: [tebogo@savannahsa.com](mailto:tebogo@savannahsa.com)

**Prepared by:**



Urban-Econ Development Economists  
1088 Pretorius Street, Hatfield  
Tel: 012 342 8686  
Fax: 012 342 8688  
E-mail: [elena@urban-econ.com](mailto:elena@urban-econ.com)

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## **SPECIALISTS DETAILS**

### **ELENA BROUGHTON**

Cell: 082 463 2325

E-mail: [elena@urban-econ.com](mailto:elena@urban-econ.com)

Position: Manager/Senior Economist

Qualifications: MSc Technology Management, BSc (Hon) Technology Management, BCom (Hon) Economics

Experience: 13 years

Brief profile: Elena Broughton is a senior professional and the manager of the Innovation & Sustainable Development Unit at Urban-Econ. She has extensive knowledge in various fields of economic development that includes 13 years of experience in undertaking socio-economic impact assessment studies for a variety of private clients spanning the mining, manufacturing, energy, infrastructure, and retail sectors. She also acted as a peer reviewer in several socio-economic impact assessment studies and completed a few strategic socio-economic impact assessments. Her involvement in the field allowed her to develop a sound understanding of the South African environmental legislation and developmental policies and equipped her with a widespread knowledge of socio-economic implications and benefits of various new developments.

### **NDIVHUWO MALEMAGOBA**

Cell: 073 565 2239

E-mail: [ndivhuwo@urban-econ.com](mailto:ndivhuwo@urban-econ.com)

Position: Development Economist

Qualifications: MSc Development Planning, BSc (Hons) Urban and Regional Planning *with distinction*, BSc Urban and Regional Planning

Experience: 2 years

Brief Profile: Ndivhuwo Malemagoba is a Development Economist in the Sustainable Development and Innovation Unit at Urban-Econ. She holds a Master of Science in Development Planning from the University of the Witwatersrand. During her postgraduate years, she focused on economic development and its spatial implications and manifestations. This has equipped her with sufficient background knowledge to conduct economic impact assessments for various development projects. Further to this, her work experience has been inclusive of project management, land use management and qualitative and quantitative research. Her application of all knowledge and skills gained thus far sharpen her ability to make a prominent contribution to current and future development projects.

## **ABBREVIATIONS**

CAGR	Compounded Average Growth Rate
DM	District Municipality
DoE	Department of Energy
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
GDP	Gross Domestic Product
GDP-R	Gross Domestic Product per Region
Ha	Hectare
I&AP	Interested and Affected Parties
IDZ	Industrial Development Zone
IPP	Independent Power Producer
IPAP	Industrial Policy Action Plan
IRP	Integrated Resource Plan
LM	Local Municipality
MW	Mega Watt
NDP	National Development Plan
NEA	Not Economically Active
NGPF	New Growth Path Framework
NPA	National Port Authority
PGDP	Provincial Growth and Development Plan
PSEDS	Provincial Socio-Economic Development Strategy
RBIDZ	Richards Bay Industrial Development Zone
SEZ	Special Economic Zone
SDF	Spatial Development Framework

## 1. INTRODUCTION

This document is prepared by **Urban-Econ Development Economists** (Urban-Econ) in response to a request by **Savannah Environmental (Pty) Ltd** (Savannah Environmental) to undertake a Socio-Economic Impact study for the proposed Richards Bay Combined Cycle Power Plant (CCPP) near Richards Bay, in the KwaZulu-Natal Province. The socio-economic impact study is conducted as part of the Environmental Impact Assessment (EIA) process managed by Savannah Environmental.

### 1.1 Brief description of the project

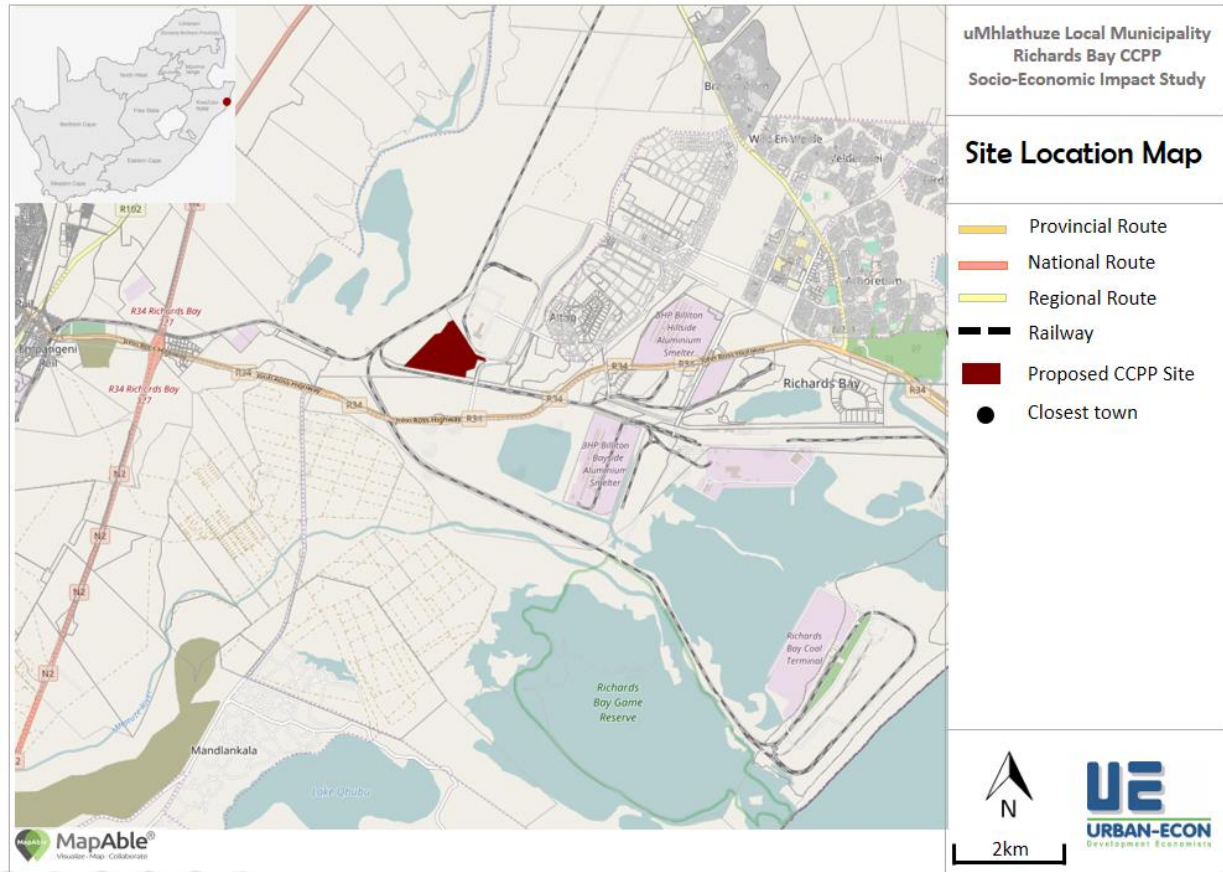
The Richards Bay Combined Cycle Power Plant (CCPP) involves the construction of a gas-fired power station which will provide mid-merit power supply to the electricity grid. The weekly mid-merit power supply will be between a range of 20% to 70% of the total electricity supply produced by the Richards Bay CCPP. The power station will have an installed capacity of up to 3 000MW, to be operated on natural gas, with diesel as a back-up fuel. The natural gas is to be supplied via a gas pipeline to the CCPP from the supply take-off point at the Richards Bay Harbour by potential gas suppliers. The Liquefied Natural Gas (LNG) terminal infrastructure at the port and the gas supply pipeline to the boundary fence of the Richards Bay CCPP does not form part of the scope of this assessment.

The main infrastructure associated with the facility includes the following:

- » Gas turbines for the generation of electricity through the use of natural gas or diesel.
- » Heat recovery steam generators (HRSG) to capture heat from high temperature exhaust gases to produce high temperature and high pressure dry steam to be utilised in the steam turbines.
- » Steam turbines for the generation of additional electricity through the use of dry steam generated by the HRSG.
- » Condensers for the conversion of steam back to water through a cooling process.
- » Bypass stacks associated with each gas turbine.
- » Exhaust stacks for the discharge of combustion gases into the atmosphere.
- » A water treatment plant for the treatment of potable water and the production of demineralised water (for steam generation).
- » Water pipelines and water tanks to transport and store water of both industrial quality and potable water to be supplied by the Local Municipality.
- » Dry-cooled system consisting of air-cooled condenser fans situated in fan banks.
- » Closed Fin-fan coolers to cool lubrication oil for the gas and steam turbines.
- » A gas pipeline and a gas pipeline supply conditioning process facility for the conditioning and measuring of the natural gas prior to being supplied to the gas turbines. It must be noted however that the environmental permitting processes for the gas pipeline construction and operation will be undertaken under a separate EIA Process.
- » Diesel off-loading facility and storage tanks.
- » Ancillary infrastructure including access roads, warehousing, buildings, access control facilities and workshop area, storage facilities, emergency back-up generators, firefighting systems, laydown areas and 132kV and 400kV switchyards.

- » A power line to connect the Richards Bay CCPP to the national grid for the evacuation of the generated electricity. It must be noted however that the due environmental permitting processes for the development of the power line component are being undertaken under a separate EIA Process.

The project is located in the City of uMhlatuze Municipality and within the King Cetshwayo District Municipality (previously referred to as the uThungulu District Municipality) in KwaZulu-Natal. The site is in Richards Bay, and is about 5km from the Central Business District.



**Map 1-1 Location of Proposed CCPP**

## 1.2 Scope and purpose of the study

The socio-economic impact assessment contains information that, together with other specialists, allows assessment of the project from a sustainable development perspective and assists in identifying "the Best Practicable Environmental Option (BPEO)" that provides the "most benefit and causes the least damage to the environment, at a cost acceptable to society, in the long-term and the short-term". Considering the above and in line with the Environmental Impact Assessment (EIA) Regulations of 2014, the purpose of the socio-economic impact assessment is to assess the need and desirability of the project. It specifically aims to ensure that the project, if approved, provides for justifiable social and economic development outcomes. As such, it aims to:

- \* identify, predict, and evaluate geographical, social, economic, and cultural aspects of the environment that may be affected by the project activities and associated infrastructure; and

- \* advise on the alternatives to best avoid negative impacts, or allow to manage and minimise them to acceptable levels, while optimising positive effects.

The specific objectives of the study include:

- \* Engage with the environmental practitioner, other specialists on the team and the client to gain necessary background on the project;
- \* Delineate the zone of influence in consultation with other specialists on the team;
- \* Determine the affected communities and economies located in the zone of influence and identify sensitive receptors within the delineated study area, i.e. communities, land uses and economic activities that could be directly or indirectly negatively affected by the proposed project or benefit from it;
- \* Review secondary data and assess data gaps;
- \* Conduct a site visit and collect primary social and economic data of the parties that may be directly or indirectly affected (positively or negatively) by the proposed project to address data gaps;
- \* Create profiles for the communities and economies representing the study areas and the environmentally affected zone;
- \* Assess the need and desirability of the project and its alternatives in line with the specified guidelines;
- \* Identify, predict, and evaluate the potential positive and negative impacts associated with the project following the environmental specialist's methodology;
- \* Advise on the most suitable alternative, inclusive of the "no-go" option; and
- \* Develop a mitigation plan by proposing mitigation measures for negative effects and enhancement measures for positive impacts.

### 1.3 Methodology

The following methodology was followed in completing the study:

- \* **Orientation:** The study started with gaining an understanding of the proposed project during various stages of its lifecycle and the potentially affected environment. A review of various data and maps provided for the project, as well as discussions with the project team, informed the delineation of the potential zone of influence associated with each component of the project. The delineated zone of influence defined the spatial boundaries of the area to be included in the assessment and assisted in identifying likely impacted and beneficiary communities and economic activities, as well as other stakeholders of the project.
- \* **Policy alignment review:** Relevant government policies and other strategic documents were gathered and reviewed to determine the alignment of the proposed project with the strategic plans of various government spheres and highlight any potential red flags, if such exist.
- \* **Baseline profiling:** Following policy review, primary and secondary data were gathered to create the socio-economic profile of the delineated zone of influence. The baseline profile assisted in gaining an understanding of the communities and economic activities likely to be affected or benefit from the proposed project. This included the description of the study area's composition and locational factors, economic and labour profiles, way of life of communities located within the zone of influence, their demographic trends and cultural references, their health and wellbeing, and their living environment. Specific attention was paid to the socio-



economic composition of the area affected by the project's footprint and its potential environmental effects, i.e. visual, noise, air pollution, etc.

- \* **Impact analysis and evaluation:** derived from the review of the project and its need and desirability is the list of various negative and positive socio-economic impacts that can ensue because of the proposed activity during various stages of its life cycle. All identified socio-economic impacts were assessed and categorised in line with the rating provided by the environmental specialist (refer to Annexure A).
- \* **Formulation of mitigation and enhancement measures:** Following the analysis and ranking of impact, mitigation, and enhancement measures, where applicable, were formulated whereby recommendations to reduce or eliminate the potential negative effects on the affected parties and enhance positive impacts were provided.

#### **1.4 Data gathering and consultation process**

The project made use of both primary and secondary data in order to assess the impacts and desirability of the project.

##### **1.4.1 Secondary data analysed**

- \* Stats SA Census, 2011
- \* Quantec Research Standardised Regional Data, 1995-2013

##### **1.4.2 Primary data collected**

The primary data gathering for this project was done via in-person interviews. The site visit and meetings with key respondents took place on the 24<sup>th</sup> of April 2017. The following people were interviewed:

- \* Mthokozisi Mhlongo - Land Use Manager (City of uMhlathuze Municipality)
- \* Londiwe Zama – Senior Town Planner (City of uMhlathuze Municipality)
- \* Brenda Strachan – Spatial Planning Manager (City of uMhlathuze Municipality)
- \* Sharin Govender - Environmental Planning (City of uMhlathuze Municipality)
- \* Sibongile Qulu – Property Evaluations (City of uMhlathuze Municipality)
- \* Wisdom Mpofu- Environmental Planning (King Cetshwayo District Municipality)
- \* Candice Webb – Environmental Manager (Mondi Factory)

#### **1.5 Assumptions, limitations and gaps in knowledge**

- \* The secondary data sources used to compile the socio-economic baseline (demographics, dynamics of the economy) although not exhaustive, can be viewed as being indicative of broad trends within the study area.
- \* The study was done with the information available to the specialist within the time frames and budget specified.
- \* Possible impacts and stakeholder responses to these impacts cannot be predicted with complete accuracy, even when circumstances are similar, and these predictions are based on research and years of experience, taking the specific set of circumstances into account.

- \* It is assumed that the motivation, and ensuing planning and feasibility studies for the project were done with integrity and that all information provided to the specialist by the project proponent and its consultants to date is accurate.
- \* Regarding the in-person interviews undertaken, it is assumed that questions asked during the interviews were answered accurately.
- \* The economic modelling was done using the data provided by the client. Any changes to the assumptions concerning the expenditure during construction and operational phases would have implications on the economic assessment. However, these are unlikely to result in changes to the significance ratings.

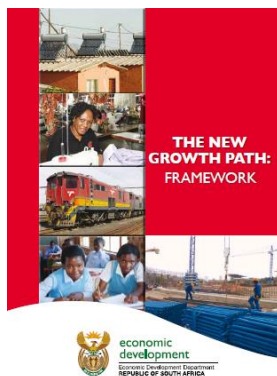
## 2. POLICY REVIEW

A policy review plays an integral role in the initial stages of a project. The review provides an indication of whether a project is aligned with the goals and aspirations of the developmental vision across the three spheres of government. Furthermore, the analysis signposts any red-flag or developmental concerns that could jeopardise the development of the project and assist in amending it, preventing costly and unnecessary delays.

The following government strategic documents applicable to the delineated project site area were examined:

- \* National (South Africa):
  - o New Growth Path Framework (NGPF) (2011)
  - o National Development Plan (NDP) 2030 (2011–2030)
  - o Integrated Resource Plan for Electricity (IRP) 2010-2030
  - o Industrial Policy Action Plan (IPAP) (2016/2017–2018/2019)
- \* Regional (KwaZulu-Natal Province):
  - o KwaZulu-Natal Provincial Growth and Development Plan (2016)
  - o Provincial Spatial Economic Development Strategy (PSEDS) (2016)
- \* Local (uThungulu DM and uMhlathuze LM):
  - o uThungulu District Municipality Growth and Development Plan (2015)
  - o uThungulu District Municipality Integrated Development Plan (IDP) 2011/12-2016/17 (2016)
  - o City of uMhlathuze Municipality Integrated Development Plan (IDP) (2016)
  - o Richards Bay Integrated Development Zone (RBIDZ) (2016)
  - o uThungulu Spatial Development Framework (SDF) (2015)
  - o City of uMhlathuze Spatial Development Framework (SDF) (2016)

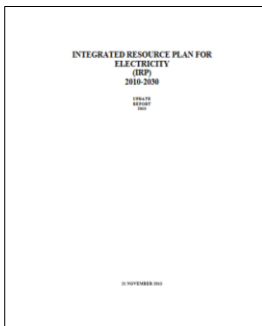
### 2.1 Project alignment with national policies and strategic documents



The vision of the **New Growth Path Framework (NGPF)** is to ensure that jobs and decent work are at the centre of economic policy (Department of Economic Development, 2011). The key problem / issues are mass joblessness, poverty, and inequality. The lack of access to energy is identified as a major concern for the growth of the economy. Therefore, increased access to energy would have a profound effect on curbing poverty and unemployment. The framework states that public investment can create 250 000 jobs per annum in energy, transport, water, communications infrastructure and housing. These jobs are said to be in four activities, the construction of new infrastructure; the operation of new facilities; expanded maintenance; and the manufacture of components for the infrastructure programme (Department of Economic Development, 2011).



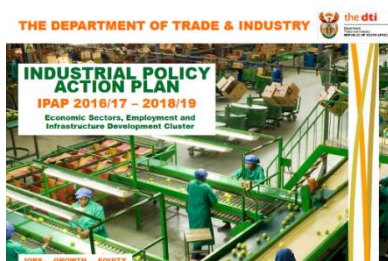
The **National Development Plan (NDP) 2030** aims to address parts of the South African triple development challenges of poverty and inequality by 2030. The Plan is informed by the NGPF and states that the diversification of energy such as liquefied natural gas imports and the associated infrastructure is imperative as it could provide economic and environmentally positive alternatives for power production (National Planning Commission, 2011). Furthermore, the plan states that combined cycle gas turbines provide flexibility in the power system and complements variable supply from renewable energy sources. It is envisaged that by 2020, liquefied natural gas infrastructure will be in place to power the first combined cycle gas turbines (National Planning Commission, 2011).



The **Integrated Resource Plan for Electricity (IRP) 2010 – 2030 promulgated in 2011** argues that the development of the electricity generation sector can support the growth of the national economy (Department of Energy, 2013). The IRP calls for a diversified energy mix, in terms of new generation capacity. The plan asserts that natural gas presents the greatest significant potential in the energy mix. It is envisaged that the gas-derived electricity will be through open-cycle gas turbines (OCGT) and combined cycle gas turbines (CCGT), which should generate 3.9GW and 2.4GW, respectively. While the above-mentioned supply is the target for 2030, the IRP asserts that CCGT technologies and an LNG terminal needs to be built urgently so that the first CCGT capacity is available by 2020 to assist with electricity supply in the short run. The IRP recognises that Gas Fired Combined Cycle Gas Turbines (CCGTs) present the most significant potential for developing the gas market in South Africa. The advantages of developing CCGT plants have been listed as:

- Relatively short construction and commissioning lead times
- Low capital costs per unit of capacity
- Increased efficiency using simple and proven technology
- Operational flexibility as they can be ramped up or down to suit the system demand on an hourly or daily basis (Department of Energy, 2013).

A draft IRP 2018 is currently in the process of being reviewed and commented on. This document considers the changes in initial assumptions and extends the study period to 2050. Furthermore, the 2018 IRP draft states that energy infrastructure is a pivotal factor that boosts economic activity and growth across the country, and it ought to meet industrial, commercial and household needs (Department of Energy, 2018)



The **Industrial Policy Action Plan (IPAP) 2016/2017 – 2018/2019** represents a significant step forward in scaling up the country’s efforts to promote long-term industrialisation and industrial diversification. It has been recognised that the Southern African region is fast transforming into an oil and gas jurisdiction led by major

on and offshore gas finds in Mozambique, Tanzania, Botswana and Namibia. From a South African perspective, the scale of the find in neighbouring Mozambique (estimated at between 200-250tcf) is of particular significance. Accordingly, the plan states that a key industrial growth path is gas-based industrialisation (Department of Trade and Industry, 2016).

In the updated IPAP (2018/2019 – 2020/2021), the DTI also emphasizes the promotion of a regional gas strategy and the entry of private sector players to guarantee the delivery of the new resources in notable volume into the South African gas market industrialisation (Department of Trade and Industry, 2018). The main short-term objective is to attract investors to explore and develop South Africa’s natural gas resources through the establishment of natural gas markets which will contribute to the expansion of domestic industrial gas utilisation and capitalising the infrastructure necessary to connect supply to growing demand. The main objective in the long-run is the establishment of a “vibrant gas industry delivering affordable and secure gas supply to the heavy industry, manufacturing and transport sectors” (Department of Trade and Industry, 2018).

The **Gas Utilisation Master Plan (GUMP)** was created to assist in achieving the objectives of the IRP by driving the development of the gas-to-power industry in South Africa. According to the GUMP, the social economic advantages of establishing a large gas-to-power industry include job creation (during construction and operation), industrial development, the potential to use LNG instead of diesel, and a source of cheaper energy.



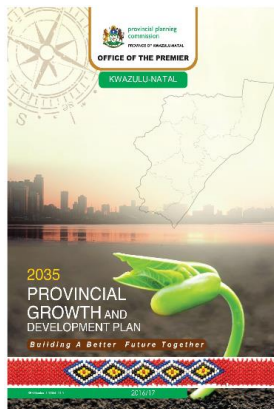
South Africa’s gas-to-energy development plan spans 30 years, in which gas supply is envisaged to include local indigenous supply as well as imports through pipelines and by ship.

The GUMP identifies challenges facing the development of the gas industry in South Africa. These are: limited domestic supply; no immediate gas demand as yet; lack of gas infrastructure (no LNG import terminal yet); no gas master plan. It is envisaged that by the time construction of the proposed development is complete, more gas infrastructure will be available, such as the LNG import terminal at the Richards Bay port. However, the proposed development itself contributes towards gas infrastructure and, therefore, helps alleviate one of the challenges facing the industry. GUMP identifies that there are potential gas reserves in the Karoo basin, deep offshore, and at the Ibhubesi basin. Through the local pipeline infrastructure, the gas-fired station in Richards Bay could acquire local gas cheaply if the infrastructure to obtain it is developed. However, as identified, the lack of said infrastructure is currently a constraint. The timing of the development will likely fall in-line with the development of other gas-related infrastructure such as the LNG port in Richards Bay and the extension of gas pipelines; therefore, the proposed project supports the implementation of GUMP.

**A correlation between the proposed CCPP Plant with the aims of national policies is evident. The job creation activities identified in the NGPF such as construction,**

operations and expanded maintenance are phases of the proposed CCPP. The NDP and IRP explicitly recommend and have targets for the development of a CCPP by 2020. Lastly, the IPAP sought to make use of regional gas resources and envisions a gas-based industrialisation. Overall, more efficient and competitive infrastructure is envisaged, particularly infrastructure that facilitates economic activity and is conducive to growth and job creation.

## 2.2 Project alignment with provincial policies and strategic documents

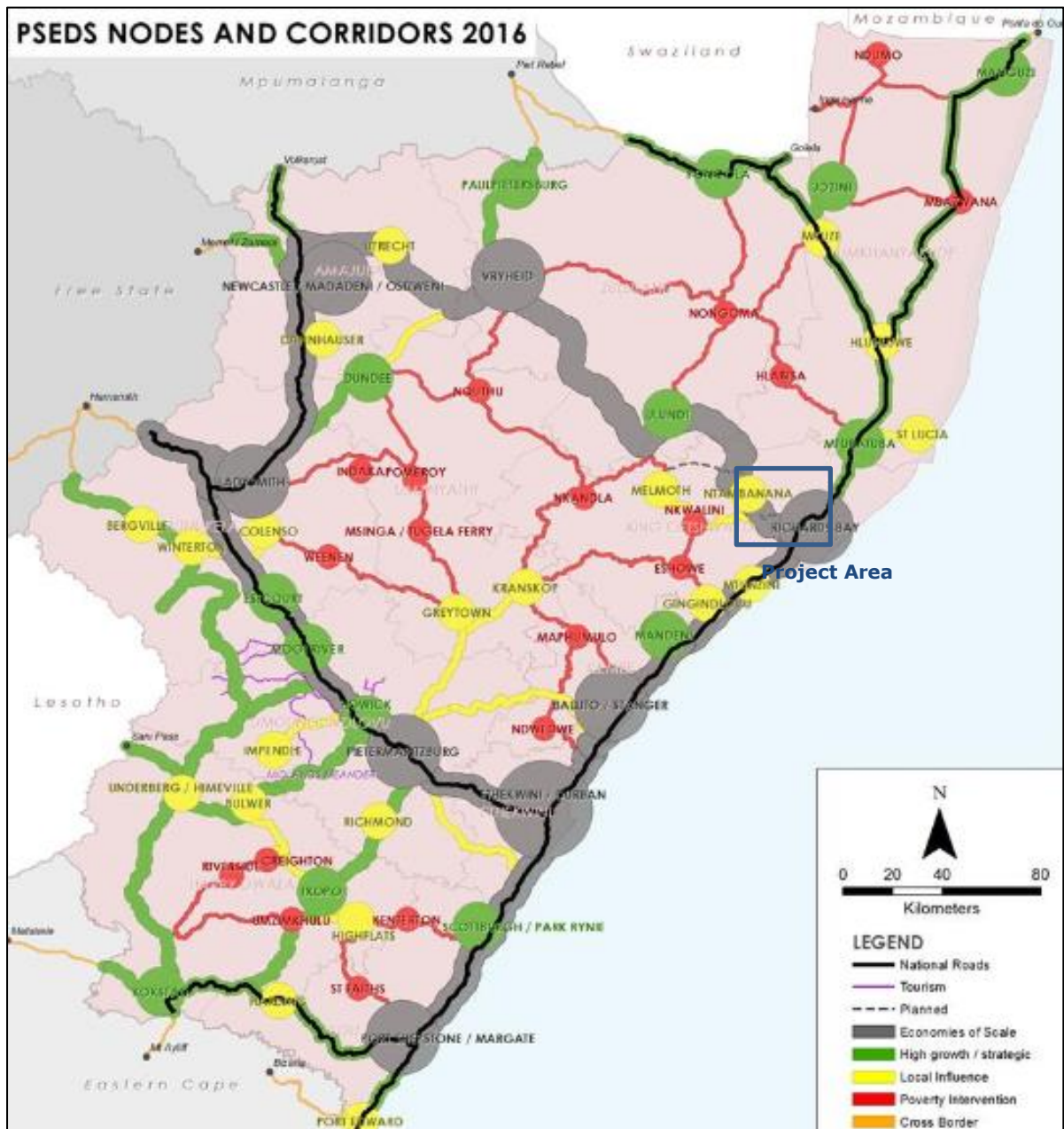


Similar to the NDP and NGPF, the **KwaZulu-Natal Provincial Growth and Development Plan (PGDP)** aims to curb poverty, inequality and achieve shared growth. The PGDP has identified spatial marginalisation as one of the key issues to be addressed through ensuring economic opportunities that will meet the majority of the population's needs. The plan states that alternative sources of energy are a priority and must be realised. This energy is anticipated through gas and diesel turbines which were anticipated to be on-line in 2016 (Provincial Planning Commission, 2016).

A catalytic project is defined as a project of significant scale and scope that will make a substantial impact and contribution to the achievement of the vision and goals of the Province. The Industrial Development Zone (IDZ) is defined as a game changer in the context of catalytic projects. The proposed CCPP will be located near the IDZ Phase 1D (Provincial Planning Commission, 2016).

The **Provincial Spatial Economic Development Strategy (PSEDS)** serves as a framework for the prioritisation of spatial economic development initiatives in the province. It is meant to capitalise on complementarities and facilitate consistent and focused decision making. In addition, the purpose of the strategy is to ensure that investment occurs in the sectors that provide the greatest socio-economic return to investment (Department of Economic Development, 2016).

Map 2-1 below demonstrates that the proposed project area is located in an area demarcated as having economies of scale. Economies of scale are achieved when the number of units produced, or the volume of services sold are at such a large scale that it allows for the reduced production costs, ultimately increasing the competitiveness of the product or service. High demand for the product or a service is a pre-requisite for economies of scale; this implies that the area where the proposed project is to be built enjoys high demand for selected goods and services, including electricity. The area is already highly industrialised and hosts an IDZ, which continuously seeks new investments in ICT, agro-businesses, and metals beneficiation. Therefore, the project is to be located in a potentially high economic growth region.



**Map 2-1: KZN Spatial Economic and Development Strategy Nodes and Corridors (PSEDS, 2016)**

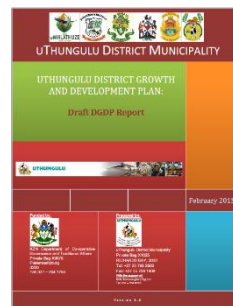
The provincial policy arena reveals support for the development of a CCPP plant. The Provincial Growth and Development Plan anticipated the development of a CCPP for 2016. Furthermore, as indicated in the PSEDS, the project is to be located in a strategic region.

### 2.3 Project alignment with local policies and strategic documents

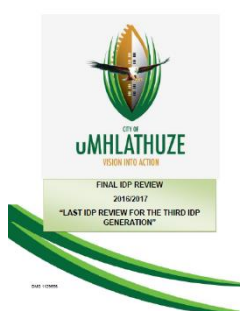
The <sup>1</sup>uThungulu District Growth and Development Plan (DGDP) has an integral role in the integration and alignment of the goals of the NDP at national level and PGDP at

<sup>1</sup> UThungulu District Municipality was renamed King Cetshwayo District Municipality in July 2016

provincial level. Therefore, the purpose of the DGDP is to translate the Provincial Growth and Development Plan into a detailed implementation plan at a district level (Uthungulu DM, 2015). One strategic intervention identified by the plan is the implementation of the roll-out programme for alternative sources of energy supply in the district where the gas-fixed electricity generation is classified as alternative energy supply.



The vision for the **uThungulu District Municipality Integrated Development Plan IDP 2016/17** is to be *"an economically viable district with effective infrastructure that supports job creation through economic growth, rural development and promoting of our heritage"* (uThungulu DM, 2016;12). As indicated in the vision, one of the goals is infrastructure development and service delivery. In addition, the plan further states that a combined strategy between the King Cetshwayo DM and Eskom is urgently required to form an integrated and sustainable electricity service delivery within the district. The Richards Bay Industrial Development Zone (RBIDZ) is identified as a catalytic project (uThungulu DM, 2016). Quintessentially, the objective is to promote economic growth in the District and improve the socio-economic conditions of residents.



Like the District IDP, the **City of uMhlathuze Municipality Integrated Development Plan's** objective is to promote economic growth in the District and improve the socio-economic conditions of residents (uMhlathuze LM, 2016). The unsustainable use of resources, including energy, will ultimately compromise the Municipality's energy security. Challenges similar to these prompted the IDP to focus on sustainable solutions to the energy crisis. Therefore, the aim is to reduce the demand for energy and simultaneously investigate alternative energy sources.



The purpose of the **Richards Bay Industrial Development Zone (RBIDZ)** is to utilise the competitive advantage of the Richards Bay area to attract sustainable investments that stimulate economic growth, job creation, beneficiation of resources and the empowerment of people. Amongst other industrial efforts, the RBIDZ has assumed a role in stewarding the establishment of an energy production hub (Richards Bay IDZ SOC, 2016). In addition, non-renewable energy is one of the economic comparative advantages and these are key maritime opportunity areas for gas-to-power facilities. In this quest, there are ongoing collaborations with the Department of Energy to ensure that the province of KwaZulu-Natal contributes significantly to the amelioration of the burdensome load shedding phenomenon. Furthermore, these efforts will produce diversified energy generation capacity for renewable sources.



The local policies place emphasis on improving service delivery and socio-economic conditions for residents. The Richards Bay IDZ is a key project for economic growth and achieving some of the main objectives in the municipality. The IDZ makes a clear call for gas-to-power facilities to be established in its vicinity. In essence, a dedicated support for the CCPP project is reflected in local policy.

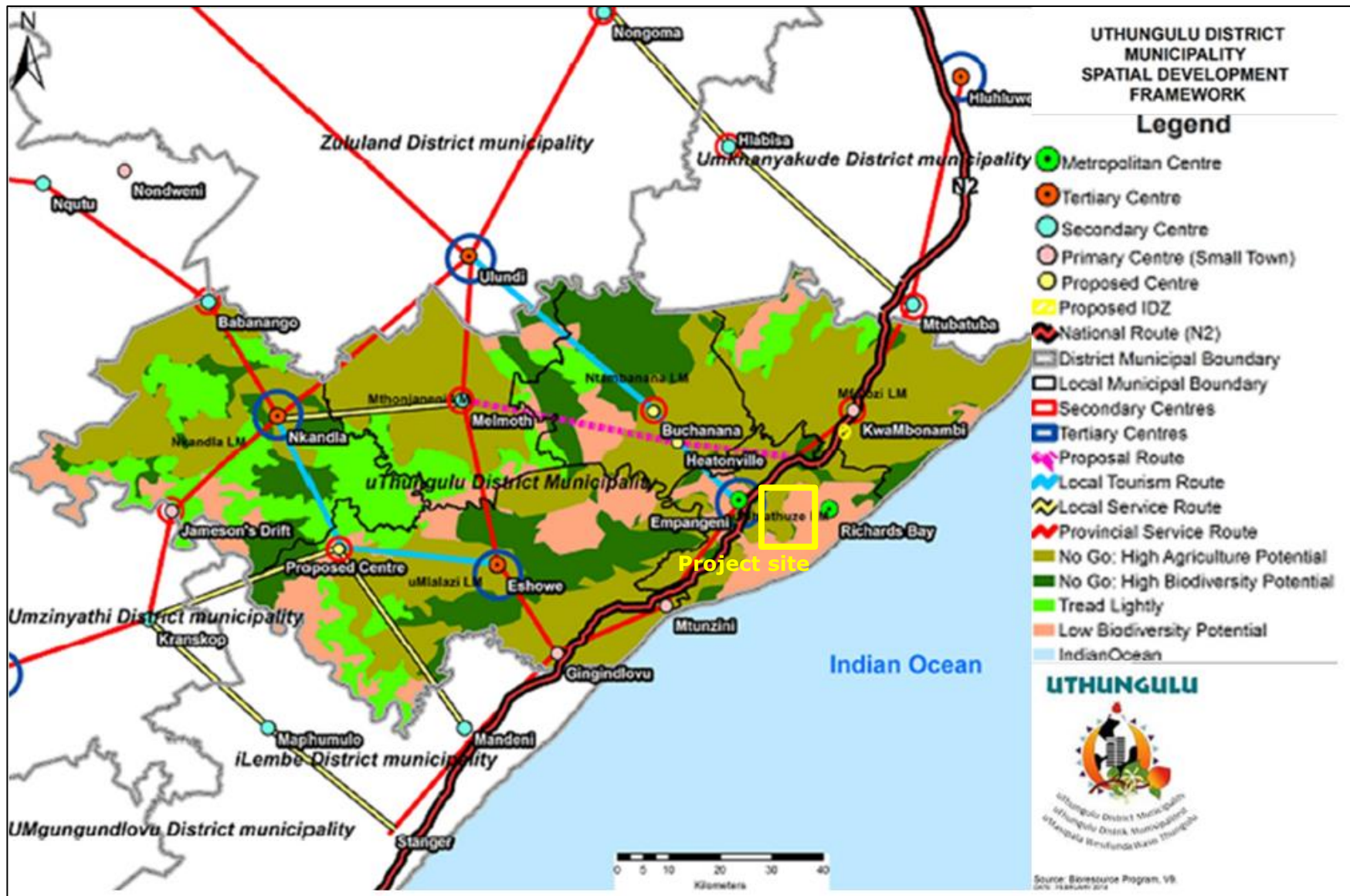
## 2.4 Project alignment with Spatial Development Frameworks



The **uThungulu District Municipality Spatial Development Framework** serves to provide a high level spatial plan, which can be used by municipalities to guide local level spatial, precinct and statutory planning. The SDF employs a structural approach aimed at identifying and restraining the current inefficiencies in the use of district and regional space (uThungulu DM, 2015).

From an infrastructure perspective, the SDF calls for centralisation and rationalisation in the provision of infrastructure and services, using available space in a quest to address the inefficiencies and costs (social, environmental and economic) associated with uncontrolled urban sprawl. Considering economic issues, the provision of spatial locations where distinct typologies of economic development is appropriate and can be used to benefit local communities and the regional economy without further destroying the dynamic balance between landscape and society, is recommended (uThungulu DM, 2015).

Map 2-2 below illustrates that the proposed project area is in a low biodiversity potential area.



Map 2-2: uThungulu District Municipality Spatial Development Framework



**SDF REVIEW**

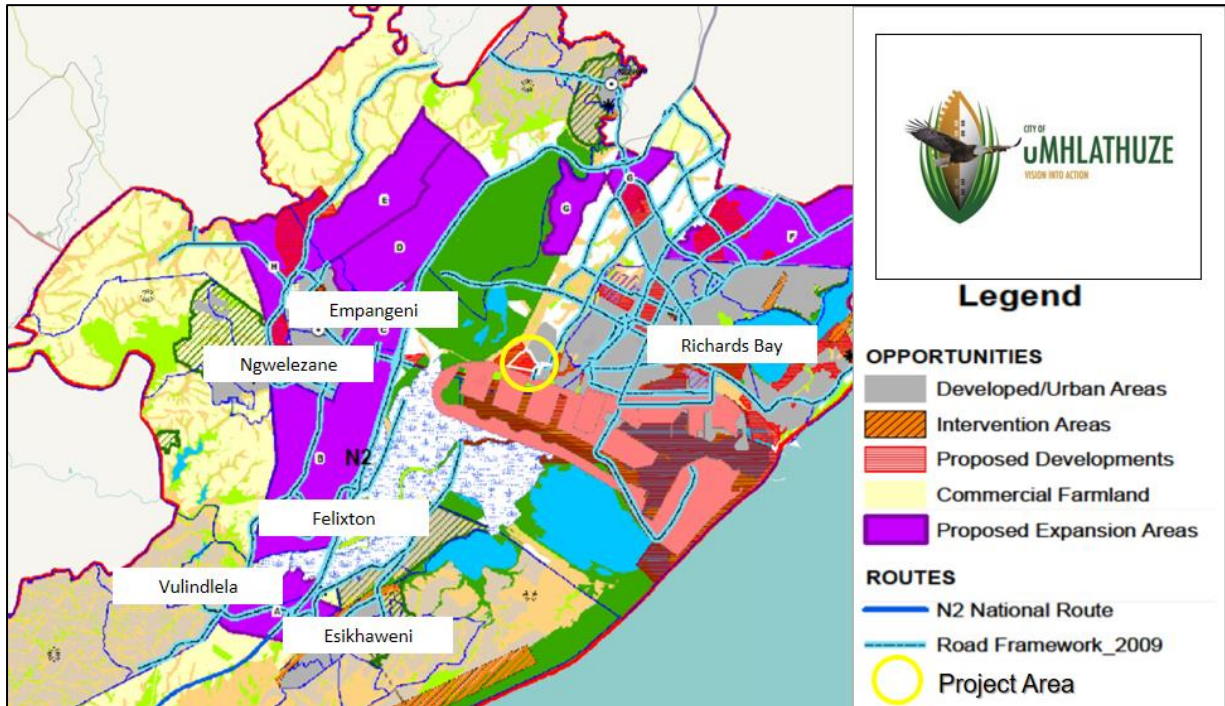
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MASTER ON DMS 110841

Control Officer  
 Municipal Manager  
 uMHLATHUZE  
 LOCAL MUNICIPALITY  
 Richards Bay  
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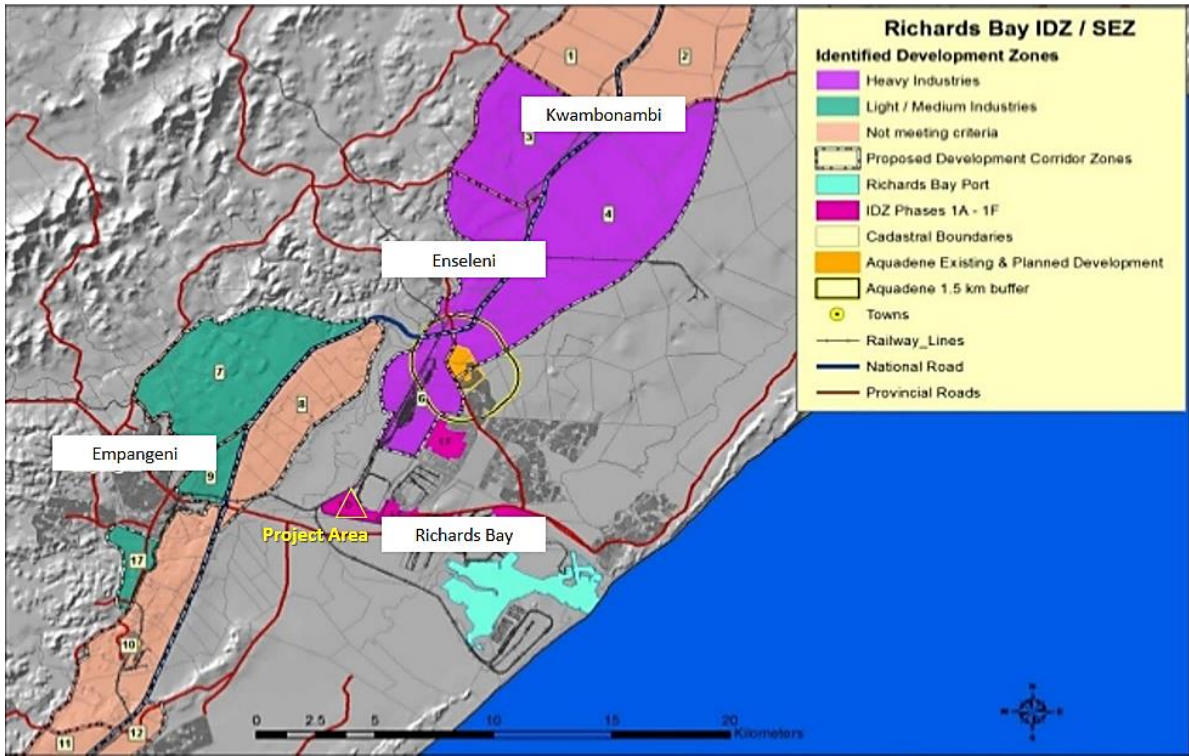
Telephone: 031 0207000  
 Fax: 031 0207001  
 Email: [info@umhlathuze.gov.za](mailto:info@umhlathuze.gov.za)

The vision of the **City of uMhlathuze Municipality Spatial Development Framework (SDF)** is that of a *"progressive and sustained socio-economic transformation poised for equal distribution of opportunities to all citizens"* (pg. 12). The SDF classifies Richards Bay as an urban centre, with servicing capacity and opportunity for densification that can support thresholds for a range of services, industry and public transport. Furthermore, Richards Bay is regarded as the fastest development industrial centre in South Africa (uMhlathuze LM, 2016).



**Map 2-3: uMhlathuze Municipality Spatial Development Framework (uMhlathuze LM, 2016)**

As indicated in Map 2-2-4, the proposed project site is located in the IDZ. A portion of the project site is demarcated for conservation and the remainder for the proposed development. Furthermore, the site has been identified for high impact industry. The land use manager from the City of uMhlathuze Municipality states that gas to power facilities are new forms of energy generation in the city. The town planning scheme will therefore have to be reviewed in order to define and categorise the land use for gas to power facilities. Currently, the CCPP will fall under the category of high impact industry.



**Map 2-2-4 Richards Bay Industrial Development Zone (uMhlathuze LM, 2016)**

### **3. BASELINE PROFILE**

This chapter examines key socio-economic characteristics of the study area. This is essential as it provides both qualitative and quantitative data relevant to the communities and economies under observation, creating a baseline that will then assist in identifying the sensitive receptors and potential impacts.

The following socio-economic indicators are analysed in this chapter:

- \* Spatial Compositions and Land-Use
- \* Demographic Profiling
- \* The Economy and its Structure
- \* The Labour Force and Employment Structure
- \* Status of Infrastructure

#### **3.1 Study area's composition and locational factors**

##### a) Spatial Context and Regional Linkages

The KwaZulu-Natal Province is one of the country's most popular tourist destinations and was founded in 1994 when Zulu Bantustan of KwaZulu merged with the Natal Province. It is South Africa's third smallest province with an area of over 94 000km<sup>2</sup>. The province houses the second largest population with over 10 million inhabitants, which was nearly 20% of the country's total population (Brand South Africa, 2012). The Province is surrounded by Maputo in the far north east, Swaziland in the north east and Lesotho along the south west boundary. Domestically, it shares borders with Mpumalanga to the north, Free State to the west, and the Eastern Cape along the south west. KwaZulu-Natal comprises of eleven District Municipalities (DM), one of which is the eThekweni Metropolitan Municipality. The remaining ten district municipalities are the Amajuba DM, the Zululand DM, the uMkhanyakude DM, the King Cetshwayo DM, the uMzinyathi DM, the uThukela DM, the uMgungundlovu DM, the iLembe DM, Ugu DM, and the Harry Gwala DM.

uThungulu District Municipality was renamed King Cetshwayo District Municipality in July 2016. The King Cetshwayo DM is a Category C municipality. A category C municipality refers to district municipalities which are the main divisions of the national provinces. Category C municipalities are further divided into Category B, or local municipalities. This denotes that the King Cetshwayo DM municipality has a municipal executive and legislative authority in an area that includes more than one local municipality (Africa S. o., 1996). The district is sub-divided into five local municipalities (LM) namely, the City of uMhlathuze Municipality, the uMlalazi LM, the Mthonjaneni LM, the Nkandla LM, and the uMfolozi LM (Local Government Handbook, undated).

The City of uMhlathuze Municipality was merged with part of Ntombanana Local Municipality on the 3<sup>rd</sup> of August 2016. The City of uMhlathuze Municipality is a Category B municipality, which means it shares municipal executive and legislative authority with a category C municipality within whose area it falls (Africa S. o., 1996). It is the smallest local municipality of the five municipalities in the King Cetshwayo District Municipality. The main economic sector in the municipality is manufacturing, which makes up 45.9%.

Lastly, the municipality housed a population of over 360 000 in 2011 ( Local Government Handbook, undated).



**Map 3-1: King Cetshwayo District Municipality Local Municipalities and key Towns**  
(source: [www.municipalities.co.za](http://www.municipalities.co.za))

b) Major Towns and Settlements

The City of uMhlathuze Municipality was formed through the consolidation of the towns of Empangeni and Richards Bay. The other towns in the municipality are Ngwelezana and Felixton, about 28km from the proposed project area. The proposed development is located in Richards Bay. Richards Bay is considered as the industrial and tourism hub of the municipality. In addition, it is the centre of operations for South Africa's aluminium industry. The Coal Terminal is instrumental in securing the country's position as the second largest exporter of steam coal in the world. Furthermore, Richards Bay Minerals is the largest sand-mining and mineral processing operation in the world.

The next closest town is Empangeni which received its name from Mpange Trees. It is located 15kms from Richards Bay. The expansion of Empangeni town was triggered from the sugar mill construction. Many of the residents of Empangeni are employed in Richards Bay ( Brand South Africa, 2012).

c) Locational Factors and Major Tourism attractions

The project area is located over 150kms north of Durban and can be accessed via the N2. The rich abundance of birdlife that extends over a number of habitats has made tourism in Richards Bay become one of the area's premier attractions (South Africa, undated). Additionally, key tourism areas include Thulasihleka Pan, the Isimangaliso World Heritage Site, Onyoge Forest, Dlinza Forest and Nseleni Nature Reserves.

Mining activity in and near Richards Bay include ilmenite, rutite and zircon from deposits in forested coastal sand dunes which has been taking place since the mid-1970s. The Senior Town Planner of the City of uMlathuze Municipality argues that more efforts can be directed to branding the tourism in the municipality.

d) Sense of Place, History and Cultural aspects

The principle language in KwaZulu-Natal is IsiZulu followed by English and Afrikaans. The remnants of British colonialism and a combination of Zulu, Indian and Afrikaans give the province a rich cultural diversity. The rich Zulu culture in the province serves the tourism sector where visitors experience Zulu hospitality, dance, song and food.

The sense of place has transitioned from an agricultural era spurred by the sugar cane farming to industrialisation with manufacturing and mining. Current day Richards Bay is essentially an industrial town with layers of natural aesthetic and farming activity.

### **3.2 Demographic profile**

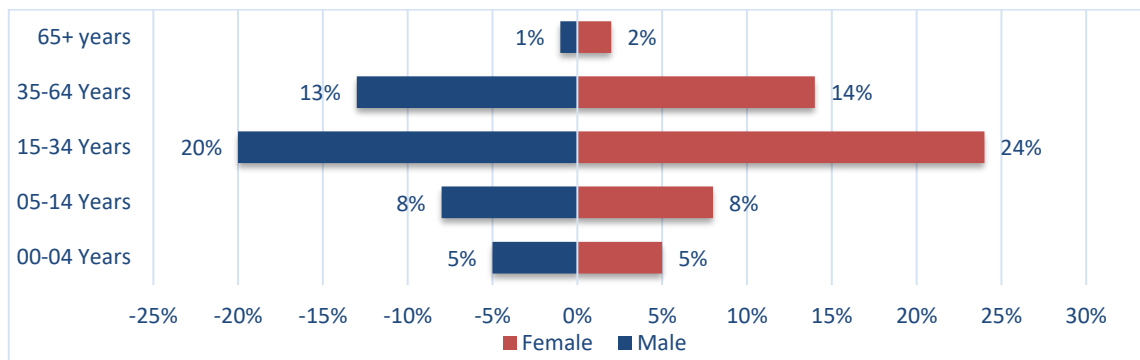
The population of any geographical area is the cornerstone of the development process, as it affects the economic growth through the provision of labour and entrepreneurial skills, and determines the demand for the production output. Examining population dynamics is essential in gaining an accurate perspective of those who are likely to be affected by any prospective development or project. This sub-section describes the status quo of the study area's population.

a) Population Demographics

The City of uMhlathuze Municipality has a population of approximately 358 282, with a total of 93 632 households (Stats SA, 2015). The City of uMhlathuze Municipality constitutes over a third of the population, thus having the highest population in the King Cetshwayo District Municipality (DM). Furthermore, 42% of the total households in the King Cetshwayo DM are located in the City of uMhlathuze Municipality. The average growth rate over the past ten years has been just over 1%. Therefore, the population has been stagnant. A large portion of 58% of the population resides in Tribal areas, followed by 39% located in urban areas, and the remaining 3% resides on Farm land (uMhlathuze LM, 2016). Therefore, the area is dominated by rural dwellings.

88% of the population are Black, 7% are White, 4% are Asian/Indian whilst the remaining 1% are Coloured. IsiZulu is the most common language in South Africa, KwaZulu-Natal and City of uMhlathuze Municipality with 23%, 81% and 79%, respectively.

Across all scales, a greater proportion of the population is comprised of females. Figure 3-3-1 below further indicates that the majority of the population are aged between 15 and 34 and the minority of the population are aged over 65 years. This denotes that, the working age group dominate.



**Figure 3-3-1: Age Gender Composition in uMhlathuze Local Municipality**

The working age population (15-64) constitutes just over 7% of the population. A quarter of the population is aged below the age of 15.

b) Health Demographics

The City of uMhlathuze Municipality had a reported 60 397 individuals that were HIV-positive in 2015, which equates to 17% of the total LM population. The percentage is greater than the provincial and national levels of 15% and 11%, respectively. This implies that decreased productivity of workers, increased absenteeism and additional costs for training new workers is prevalent. It also represents a greater demand and pressure on health facilities. This is of grave concern to the municipality's workforce and social facilities.

c) Income Levels

The average monthly household income in the City of uMhlathuze Municipality was R8 382 in 2011, with 2% of the households earning no income. Overall, 38% of the households within the local municipality earned up to R3 200 per month. In Richards Bay, 6% of the households had no income and 15% earned up to R3 200. The largest range of income earned in Empangeni is between R1 and R3 200. According to the City of uMhlathuze Municipality's land use manager, income is derived in Richards Bay, but is not retained in the town because it is spent elsewhere.

**Table 3-1: Income profile (2011)**

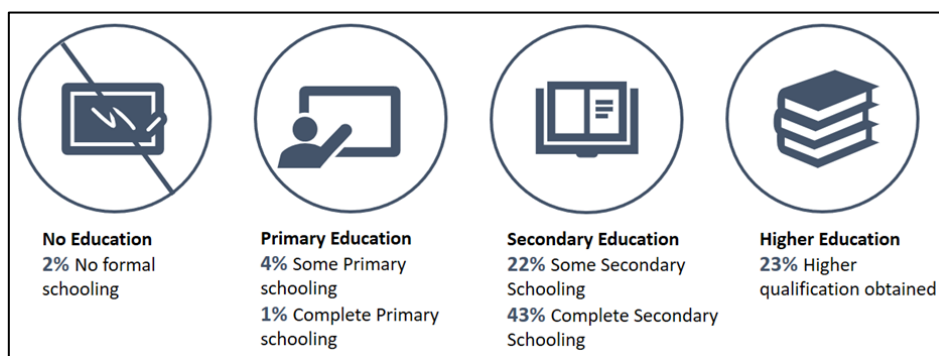
Income Level	uMhlathuze Municipality	Richards Bay	Empangeni
No Income	2%	6%	7%
R1 - R3 200	38%	15%	36%
R3 201 - R6 400	14%	14%	15%
R6 401 - R12 800	16%	21%	18%
R12 801 - R25 600	13%	21%	15%
R25 601 - R51 200	5%	11%	4%
> R51 200	2%	3%	1%

(Stats SA, 2015)

d) Education Levels

A minute percentage of the adult population (+20 years) do not have schooling. In the City of uMhlathuze Municipality and the towns of Richards Bay and Empangeni, the adult population with no schooling constitute 7%, 6% and 2%, respectively.





**Figure 3-2: Educations levels in Richards Bay (Source: Quantec, 2017)**

Richards Bay has the highest population of residents who have completed matric and have higher qualifications. Just over a third of the adult population have attained a matric certificate. The education levels are therefore moderate.

### 3.3 The Economy

In 2015, The City of uMhlathuze Municipality's economy was valued at R23 422 million in current prices. The LM contributes 69% to the economy of the King Cetshwayo District Municipality and 5% to the economy of KwaZulu-Natal. Over a period of 10 years (2005-2015), the municipality's economy grew at a positive Compounded Annual Growth Rate (CAGR) of 2% per year. This is similar to the district and provincial growth of 2.4% and 2.9%, respectively.

**Table 3-2: KwaZulu-Natal and uMhlathuze structure of economies**

Economic Sector	KwaZulu-Natal (GDP in 2015 prices)			City of uMhlathuze (GDP in 2015 prices)		
	GDP (R'mil)	% of GDP	CAGR (2005-2015)	GDP (R'mil)	% of GDP	CAGR (2005-2015)
Agriculture, forestry and fishing	21 102	5%	1.03%	570	2%	1.03%
Mining and quarrying	9 084	2%	1.00%	1 306	6%	0.97%
Manufacturing	79 104	18%	1.01%	5 757	25%	0.99%
Electricity, gas and water	10 367	2%	0.99%	532	2%	0.99%
Construction	21 278	5%	1.05%	1 158	5%	1.06%
Trade	69 115	16%	1.03%	3 271	14%	1.04%
Transport and communication	54 957	12%	1.03%	3 393	15%	1.03%
Finance and business services	80 767	18%	1.03%	3 365	14%	1.04%
General government	69 882	16%	1.03%	2 840	12%	1.02%
Personal Services	27 337	6%	1.02%	1 230	5%	1.02%
<b>TOTAL</b>	<b>442 992</b>	<b>100%</b>	<b>1.02%</b>	<b>23 422</b>	<b>100%</b>	<b>1.01%</b>

Urban-Econ Calculations based on Quantec

The economic sectors with the greatest contribution to the GDP-R of KwaZulu-Natal are Manufacturing and Finance and Business Services. Similarly, manufacturing is the highest contributing economic sector in the City of uMhlathuze Municipality. Electricity, gas and water is the economic sector with the least contribution to the GDP-R of the municipality.

Between 2008 and 2010 most economic sectors experienced a decrease in GDP-R as a result of the economic crisis. However, Construction, Trade, Finance and Business Services and General Government did not have a decline in GDP-R during that period.

### 3.4 Labour force and employment structure

Employment is the primary means by which individuals who are of working age may earn an income that will enable them to provide for their basic needs and improve their standard of living. As such, employment and unemployment rates are important indicators of socio-economic well-being. The following paragraphs examine the study area's labour market from a number of perspectives, including the employment rate and sectoral employment patterns.

#### a) Labour Force Composition

According to Census 2011 data, the working age population of the City of uMhlathuze Municipality was about 237 265. Amongst these, 137 187 were economically active. Not economically active (NEA) persons are those who were neither employed nor unemployed, including discouraged job seekers. The City of uMhlathuze Municipality had 100 078 NEA persons in 2011. The employed labour in the municipality was estimated at 99 950, whilst the unemployed labour was about 37 237. This results in an unemployment rate of 27%.

**Table 3-3: Labour Profile of uMhlathuze Municipality**

Indicators	City of uMhlathuze Municipality	Richards Bay	Empangeni
Working Age Population	237265	41302	79 193
Non-economically active	100078	14 924	38759
Labour force	137187	27207	36727
Employed	99950	23 153	25676
Unemployed	37237	4 054	11051
Unemployment rate	27%	15%	30%
Labour Participation rate	58%	65%	49%

Urban-Econ Calculations based on Quantec

As indicated in Table 3-3, in the town of Empangeni, 25 676 of the working age population are employed, whereas 11 051 are unemployed. This indicates a 30% unemployment rate. In the case of Richards Bay, the unemployment rate is half that of Empangeni.

In terms of skill levels, the largest proportion of the labour force is semi-skilled in the KwaZulu-Natal Province, King Cetshwayo DM and the City of uMhlathuze Municipality. This is followed by the low-skilled labour and the least percentage of the labour force is skilled. The Senior Town Planner from the City of uMhlathuze Municipality stated that skills developed within the municipality do not serve to benefit the municipality. This is a result of graduates from the local colleges not working within the municipality.

b) Employment Structure

Close to three quarters of the employed individuals in the City of uMhlathuze Municipality were employed in the formal sector and close to a quarter were employed in the informal sector. In both the King Cetshwayo DM, and the City of uMhlathuze Municipality, the wholesale and retail trade, catering and accommodation economic sector employs the largest number of people, whereas the Electricity, gas and water economic sector has the lowest number of employed people. However, between 2005 and 2015, the Electricity, gas and water sector has had steady employment growth. Similarly, the Construction sector and the General Government had an increase in employment numbers. On the contrary, employment in the Agricultural and Manufacturing sectors has declined from 2008-2011. The Agricultural sector however, had a notable increase from 2015.

**Table 3-4: Employment per economic sector in King Cetshwayo DM and uMhlathuze LM in 2015**

Economic Sector	King Cetshwayo District Municipality		City of uMhlathuze Municipality	
	Employment	%	Employment	%
Agriculture, forestry and fishing	19 797	11.4%	3 995	3.9%
Mining and quarrying	1 005	0.6%	723	0.72%
Manufacturing	17 162	9.8%	12 302	12.3%
Electricity, gas and water	580	0.3%	392	0.3%
Construction	14 259	8.2%	8 364	8.3%
Trade	36 049	20.7%	23 188	23.1%
Transport and communication	10 233	5.9%	7 374	7.3%
Finance and business services	22 769	13.1%	15 182	15.1%
General government	23 609	13.6%	12 743	12.7%
Personal services	28 160	16.2%	15 687	15.7%
TOTAL	173 623	100%	99 950	100%

Urban-Econ Calculations based on Quantec

### 3.5 Status of Infrastructure and Basic Service Delivery

Access to basic service delivery and infrastructure such as shelter and transport are indicators that assist in understanding the standard of living of the households residing in the study area. Comprehension of the extent to which households in the area have access to water, sanitation, and electricity assists in the understanding of communities' living standards and their needs. The availability of service infrastructure such as roads, educational and health facilities, etc., further indicates the nature of the study area, which is valuable in developing a complete profile of the circumstances in which communities are living.

a) Basic service delivery



**Figure 3-3: Overview of Service delivery in the City of uMhlatuze Municipality**

The City of uMhlatuze has a negligible **access to water** backlog of 2%. Most (89%) of the households in the municipality obtain water from the City of uMhlatuze Municipality. The key challenges include a water loss that is on average 30%. However, water loss has been reduced by 18%. In addition, severe drought conditions have resulted in water sources running completely dry. Lastly, the water extracted from drilled boreholes is of inadequate quality.

84% of households had access to the basic level of service for **sanitation** in 2015. A waterborne system is implemented in formalised urban areas and Ventilated Improved Pits (VIPs) are installed in rural areas.

The City of uMhlatuze Municipality is a licensed electricity provider, however in rural areas, **electricity** is still supplied by Eskom. The City of uMhlatuze Municipality does not have electricity backlogs in its area of supply, while a few backlogs exist in the areas within the municipality that are directly serviced by Eskom. The municipality solely operates on infills for new customers. Most of the households use electricity for lighting, cooking and heating. The minority use wood and gas amongst other alternative energy sources for lighting, cooking and heating.

The municipal **housing** backlog is estimated at 10 000 urban greenfield low-income housing, 50 000 social and community residential units, and over 6 000 rural housing, including slum clearance. About 5 100 informal dwellings were identified in 2011. The key challenge in the City of uMhlatuze Municipality is the shortage of suitably located land for housing development. Nonetheless, the establishment of rental housing units in Richards Bay and Empangeni has been prioritised.

b) Status of Infrastructure

According to the City of uMhlatuze IDP (2016), the average condition of the **road infrastructure** can be rated as fair to poor. A number of the public transport facilities in uMhlatuze form part of retail commercial developments located on either leased land from the Municipality or private land, which constrains expansion options of the facilities (Mbambo, 2011). Given that Richards Bay is one of the busiest ports in the country, it attracts a rising number of freight trucks. One challenge is the lack of appropriate truck stop facilities (Mbambo, 2011).

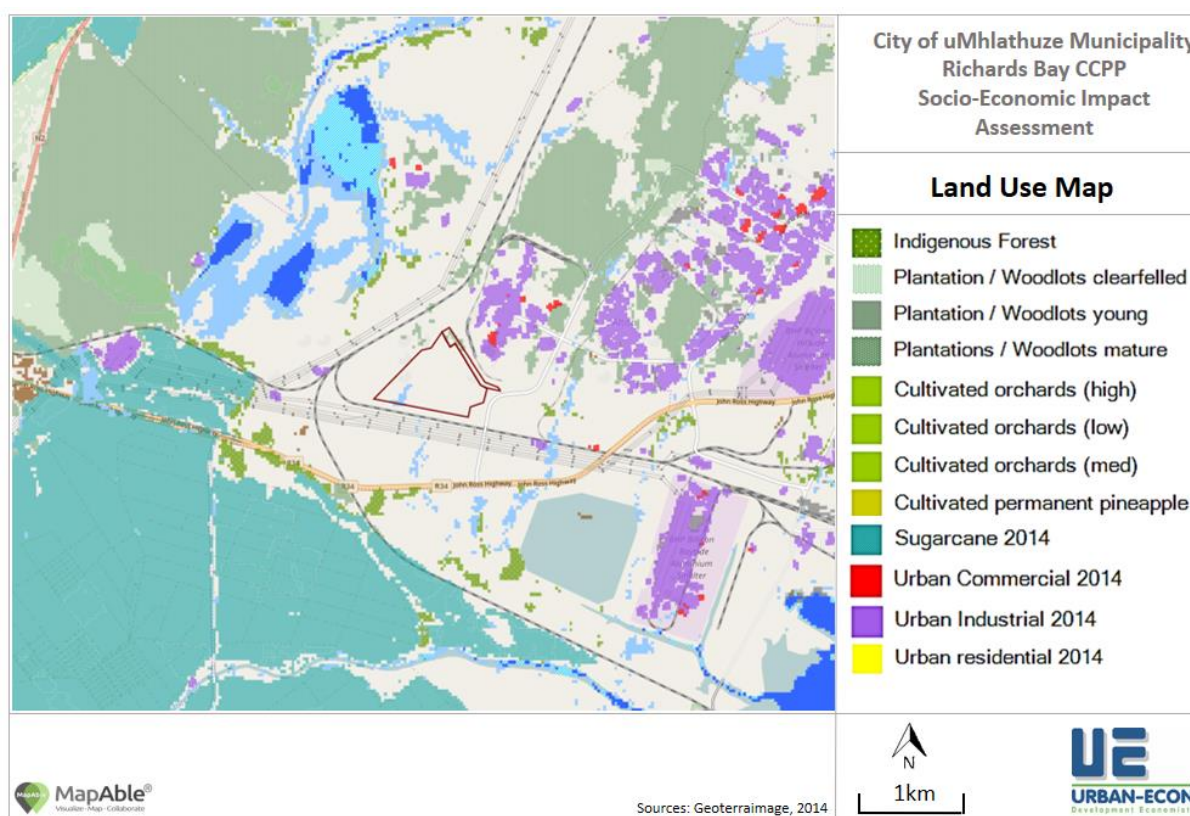
With regard to accessibility and connection across areas, the N2 is the national route that connects several areas such as Cape Town to Richards Bay. The proposed development site can be accessed from the R34 and thereafter accessibility can be through access streets.

A fifth of the children under the age of 5 are located 30 minutes from the nearest creche. There is a general acceptable level of accessibility to community halls and sports facilities in the municipality.

#### 4. SITE RELATED INFORMATION: ZONE OF INFLUENCE BASELINE

##### 4.1 Land use, zoning and capability in the zone of influence

The site-related information section will investigate the various dynamics of the proposed site. Map 4-4-1 indicates the current land uses of the proposed project site and its surroundings. The proposed site is currently a greenfield site with no development and is not serviced. The land constitutes of flora and fauna. Similarly, the direct southern and western areas from the proposed project area are not developed. The north-eastern portion of the land has high impact industrial activity inclusive of paper and pulp manufacturing and energy production. Sugarcane farming takes place in the further south-western region from the site. The north western and eastern region from the site houses plantations. In addition to agricultural land uses in the zone of influence, the dominant land use present is industrial.



**Map 4-4-1: Land use within zone of influence**

Map 4-4-2 below, demonstrates the directly affected and adjacent farm portions to the proposed CCPP development site. Portion 1 of erf 11376 is conserved land where development is prohibited as it has been earmarked as a “biodiversity offset area” by the municipality. Portion 2 and Portion 4 of erf 11376 are the directly impacted properties for the proposed CCPP. These farm portions are collectively referred to as phase 1D of the IDZ. Portions 1, 2, 3 and 4 of erf 11376 measure 54 ha, 65 ha, 5 ha and 6 ha respectively. Collectively, the proposed development area will encompass the entire extent of the project site, which is 71 ha.

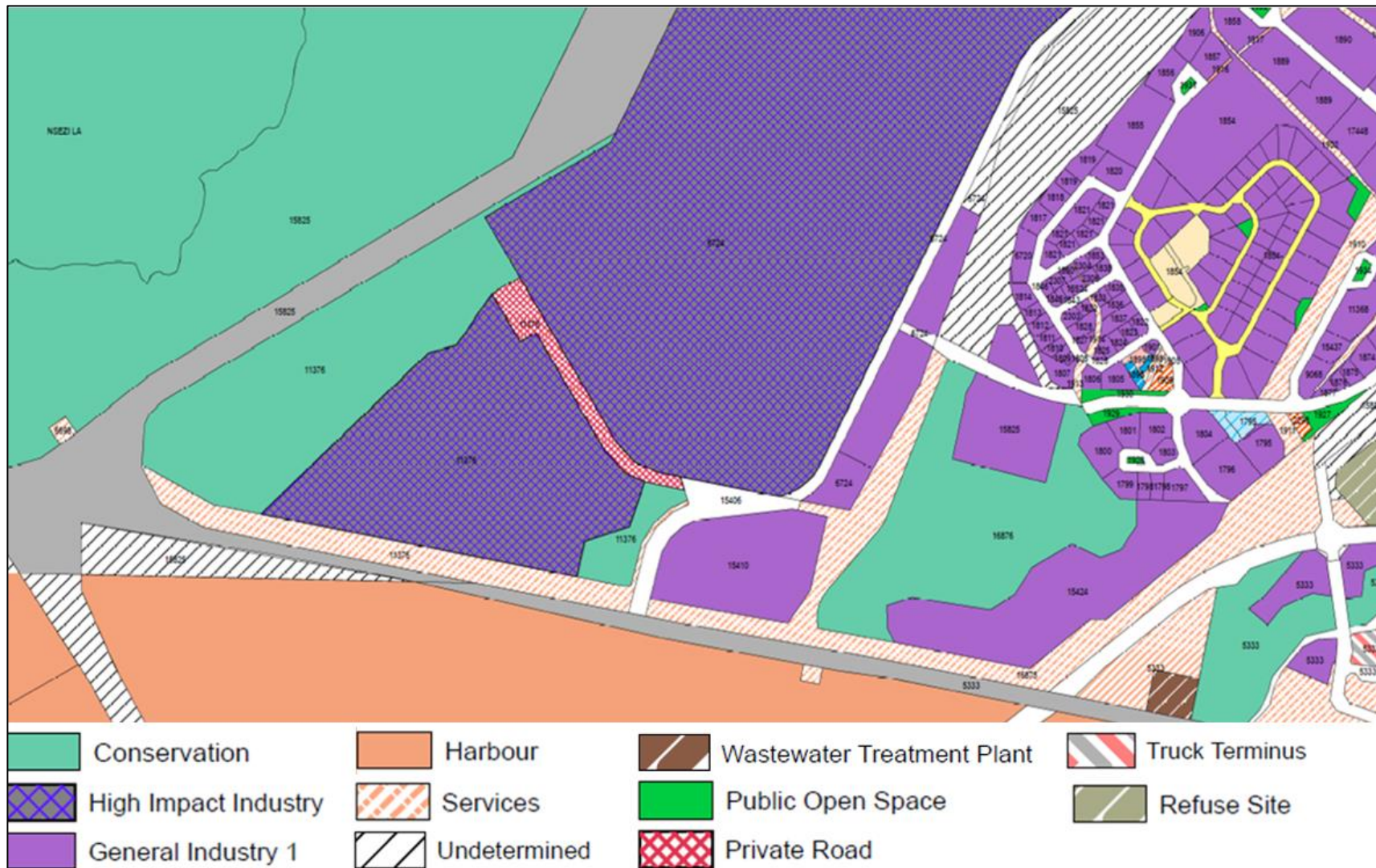


**Map 4-4-2: Directly and indirectly affected land portions**

The zoning for the IDZ phase 1D are:

- \* Portion 1 of erf 11376 is zoned conservation;
- \* Portion 2 of erf 11376 is zoned high impact industry;
- \* Portion 3 of erf 11376 is zoned conservation (to be confirmed);
- \* Portion 4 of erf 11376 is zoned private road; and
- \* Erf 15410 is zoned general industry.

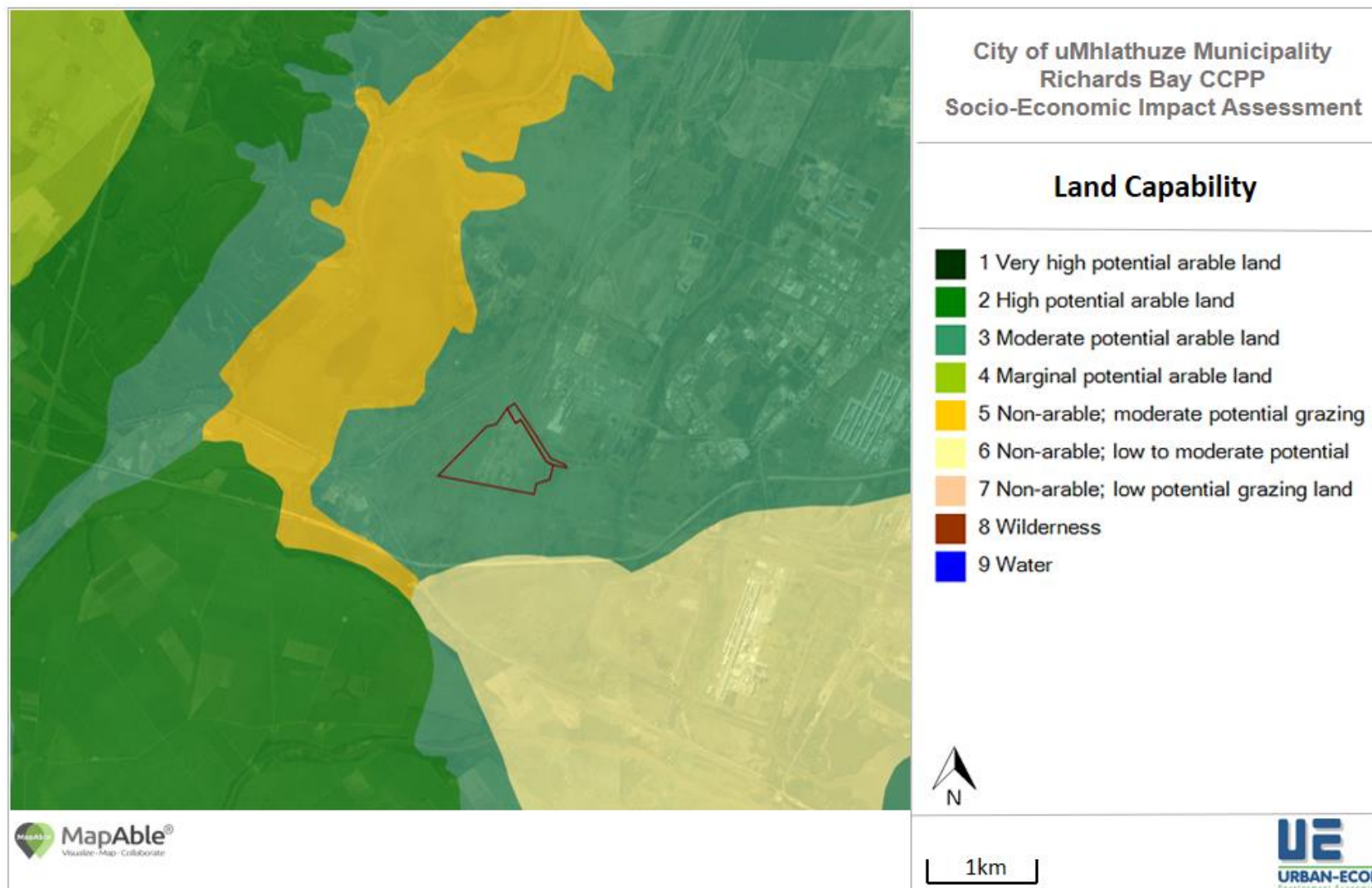
The Richards Bay IDZ and the City of uMhlathuze Municipality have, in the last two years, collaborated in taking the position as a conduit for the gas to power option. The City initially delineated eight portions to the RBIDZ, including phase 1D. According to the Land Use Manager of the City, though, Phase 1D was not accepted by the RBIDZ. Nonetheless, Phase 1D has been reserved by the City of uMhlathuze Municipality as part of the Industrial Development Zone (IDZ) to house industrialisation and other strategic projects such as gas to power projects.



**Map 4-4-3: Current Zoning Map in Zone of Influence (City of uMhlatuze GIS, 2017)**



Map 4-4-4 demonstrates that the project area is located on arable land of moderate potential. The north-west and south-east region from the proposed site is non-arable land. Along the coast towards the south-eastern region from the site is moderate mining potential.



**Map 4-4-4: Land Capability in zone of influence and surrounding areas**

## 4.2 Landowner perspectives on proposed project

The following table summarises the information gathered using both secondary and primary data sources with respect to land uses of the potentially directly and indirectly affected land portions.

**Table 4-4-1: Landowner concerns and information**

Land Portion	Land Owner	Orientation	Information
Portion 1 of erf 11376	City of uMhlathuze Municipality	Directly Adjacent land	» Conserved land
Portion 2 of erf 11376	City of uMhlathuze Municipality	Impacted land	» Reserved for industrial and high impact industry. » Land not serviced » Current servitude has no impact
Portion 3 of erf 11376	City of uMhlathuze Municipality	Directly Adjacent land	» This land can be used for coverage and off-set purposes.
Portion 4 of erf 11376	City of uMhlathuze Municipality	Impacted land	» Land to be used as an access road » Land not serviced
Erf 15410	City of uMhlathuze Municipality	Adjacent land	» No activity taking place on land
Remainder of Erf 5333	Transnet	Directly Adjacent land	» Not developable » Currently a portion has a Truck area » Portion of land used for banana farming
Erf 2 of erf 6724	Unknown	Adjacent land	No information
Erf 3 of erf 6724	Unknown	Adjacent land	No information
Erf 5 of erf 6724	Unknown	Adjacent land	» Industrial activity taking place
Erf 6 of erf 6724	Unknown	Adjacent land	No information
Erf 7 of erf 6724	Mondi	Directly Adjacent land.	» Possible health threat to CCPP employees due to odorous gases emitted at Mondi » In support of the project » Road infrastructure is well maintained

<b>Land Portion</b>	<b>Land Owner</b>	<b>Orientation</b>	<b>Information</b>
			<ul style="list-style-type: none"> <li>» Water scarcity is a concern</li> <li>» Skills shortage is a problem</li> <li>» Electrical lines not well maintained</li> </ul>
Farm 15825	Transnet	Adjacent land	» Proposed development for land: toll gate for trucks
Erf 15424	City of uMhlathuze Municipality	Adjacent land	» Relatively high property value
Erf 16676	Unknown	Adjacent land	No information

The Mondi factory located directly north-east of the proposed project site is the biggest pulp factory in the country. The factory has facilities for wood chopping, a chemical plant, a power island, a bleaching plant, and a treatment facility. In addition, Mondi exports energy onto the grid, and completely generates its own power. The potential impact stated by the environmental manager of Mondi is the odorous gases that may be a nuisance to the CCPP employees.

The general overview of the zone of influence is agricultural activity co-existing with industrial activity. The proposed project is strongly supported by the City of uMhlathuze Municipality, as well as the adjacent land owners including Transnet and Mondi amongst others. The concerns raised, however, include water scarcity, skills shortage, and limited maintenance of powerlines.

## 5. IMPACT ANALYSIS

This chapter presents the analysis of the socio-economic impacts that are expected to ensue as a result of the development of the proposed project and an evaluation of these impacts according to the predefined criteria. The potential socio-economic impacts identified arise as a consequence of construction, operation, and closure of the Proposed Combined Cycle Power Plant following the prescribed methodology (refer to Annexure A).

### 5.1 Impacts ensued during construction

#### 5.1.1 Increase in production

Economic production is defined as any activity that uses inputs such as labour and capital to produce outputs in the form of services or goods. The construction phase of the proposed power plant will involve activities such as engineering and design, site and infrastructure development, construction of buildings and facilities, installation of machinery and equipment, civil engineering works, and other business activities related to the construction of the CCPP.

The economic impact arising from the initial investment will be felt throughout the economy with windfall effects benefitting related sectors in the economy. The effect is allocated according to direct, indirect and induced impacts, together forming the "multiplier effect". These various impacts or spill-over effects spread throughout the economy, contributing to heightened production levels. The initial investment will give rise to a production effect where manufacturers and suppliers of goods and services would experience the need to expand current production levels by ramping up employee numbers and operations. Down-the-line effects will produce a consumption-induced effect on the wider economy - as total salaries paid-out rises, consumer expenditure will lift, thereby raising the sales of goods and services in the surrounding economy.

**Table 5-1: Impact on production during construction (R millions, 2017 prices)**

	Direct	Indirect	Induced	Total	
<b>Agriculture</b>	R0	R28	R395	R423	1%
<b>Mining</b>	R0	R322	R59	R381	1%
<b>Manufacturing</b>	R0	R9 257	R3 031	R12 288	26%
<b>Electricity</b>	R0	R1 922	R84	R2 006	4%
<b>Water</b>	R0	R26	R79	R106	0%
<b>Building and Construction</b>	R19 462	R3 239	R225	R22 926	49%
<b>Trade and accommodation</b>	R0	R1 683	R902	R2 585	6%
<b>Transport and storage</b>	R0	R1 020	R1 059	R2 080	4%
<b>Financing</b>	R0	R199	R693	R892	2%
<b>Real estate and business services</b>	R0	R1 141	R1 314	R2 455	5%
<b>Government and other services</b>	R0	R162	R243	R405	1%
<b>Total</b>	<b>R19 462</b>	<b>R19 000</b>	<b>R8 085</b>	<b>R46 547</b>	<b>100%</b>

Urban-Econ calculations based on data supplied by client

The construction-related activities required for the proposed power plant will take place over three years, wherein half will be spent in the first year, 30% in the second year and the remaining 20% in the last year. The investment in the development of the CCPP is valued at R19 462 million in 2017 current prices. This is forecast to create a total impact

on national production of R46 547 million (2017 prices) during the three-year construction phase. This denotes that every R1 invested during the construction phase of the project will generate R2.39 of new business sales throughout the economy. As may be seen from Table 5-1 above, the building and construction sector is set to benefit the most, largely due to the direct effect to be experienced in the sector.

Just over 40% of the production output generated by the project will be as a result of indirect effects. The production-induced effect emanating from the investment expenditure is forecast to generate heightened production levels economy-wide with the largest effects felt within the manufacturing, real estate and transport sectors.

<b>Nature:</b> <b>Expenditure associated with the construction of the proposed development will impact on the production of the local economy.</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	National (5)	National (5)
<b>Duration</b>	Short-term (2)	Short-term (2)
<b>Magnitude</b>	High (8)	High (8)
<b>Probability</b>	Highly probable (4)	Highly probable (4)
<b>Significance</b>	<b>High (60)</b>	<b>High (60)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Medium	Medium
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes (enhance)	Yes
<b>Mitigation:</b>		
» The project developer should use locally sourced inputs where feasible in order to maximize the benefit to the local economy.		
» Sub-contracting of local construction companies to occur as far as possible for the construction of facilities, given that gas turbines will be imported.		

### 5.1.2 Impact on GDP

A country's gross domestic product (GDP) is the total value of all "final" goods and services, which are produced within the borders of the country in one year. The primary method of expanding GDP levels is through investment into infrastructure and enterprises that generate goods and services. Investment into the creation of new and improved goods and services, creates heightened levels of value added within the economy.

The establishment of the proposed CCPP that is expected to cost R19 462 million (2017 prices) will generate R12 992 million of value added throughout the economy. The biggest portion will be created through production-induced effects (or indirect impact). Industries that will experience the largest temporary growth in value added, as a result of this, will include the building and construction, manufacturing and trade and accommodation sectors.

The City of uMhlathuze is currently valued at R23 422 and accounts for 70% of the districts GDP. This project will thus further boost this status of the municipality.

**Table 5-2: Impact on GDP during construction (R millions, 2017 prices)**

	Direct	Indirect	Induced	Total	
Agriculture	R0	R14	R178	R192	1%
Mining	R0	R161	R29	R190	1%
Manufacturing	R0	R2 435	R691	R3 125	24%
Electricity	R0	R956	R42	R998	8%
Water	R0	R9	R26	R34	0%
Building and Construction	R3 490	R732	R51	R4 274	33%
Trade and accommodation	R0	R878	R443	R1 322	10%
Transport and storage	R0	R431	R449	R880	7%
Financing	R0	R144	R501	R644	5%
Real estate and business services	R0	R547	R526	R1 073	8%
Government and other services	R0	R104	R156	R260	2%
<b>Total</b>	<b>R3 490</b>	<b>R6 411</b>	<b>R3 091</b>	<b>R12 992</b>	<b>100%</b>

Urban-Econ calculations based on data supplied by client

<b>Nature:</b>		
<b>Temporary increase in country's GDP due to capital expenditure during construction</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	National (5)	National (5)
<b>Duration</b>	Short-term (2)	Short-term (2)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Highly probable (4)	Highly probable (4)
<b>Significance</b>	<b>Medium (52)</b>	<b>Medium (52)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Medium	Medium
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes (enhance)	Yes
<b>Mitigation:</b>		
» The project developer is to use locally sourced inputs where feasible in order to maximize the benefit to the economy.		

### 5.1.3 Employment creation

The unemployment rate in the City of uMhlathuze is 27% and the number of employed individuals have been increasing in the past six years (Urban Econ Calculations based on Quantec, 2017). The establishment of the proposed plant is expected to create 50 706 jobs over the construction period with the building and construction sector expected to incur the highest increase in labour in total:

- \* 4 367 jobs will be created at the construction site itself and a portion of these will be made available for the local labour force, which could temporarily reduce the unemployment rate.

- \* In addition, 31 673 jobs will be established through indirect impacts during the construction phase, i.e. as a result of procurement of goods and services required for the development of the plant.
- \* A further 14 665 jobs will be created through consumption-induced impacts, i.e. as a result of directly and indirectly benefiting households spending income derived from the project on goods and services.

**Table 5-3: Impact on employment during construction (numbers)**

	Direct	Indirect	Induced	Total	Percentage (Total)
Agriculture	0	198	2 804	3 003	6%
Mining	0	115	21	136	0%
Manufacturing	0	7 970	2 362	10 332	20%
Electricity	0	1 035	45	1 080	2%
Water	0	14	43	57	0%
Building and Construction	4 367	11 693	811	16 871	33%
Trade and accommodation	0	7 069	3 759	10 827	21%
Transport and storage	0	1 089	1 083	2 173	4%
Financing	0	198	690	888	2%
Real estate and business services	0	1 136	1 308	2 444	5%
Government and other services	0	1 157	1 738	2 895	6%
<b>Total</b>	<b>4 367</b>	<b>31 673</b>	<b>14 665</b>	<b>50 706</b>	<b>100%</b>

Urban-Econ calculations based on data supplied by client

**Nature:**

**The construction of the Combined Cycle Power Plant will positively impact on the community and beyond by creating a number of job opportunities (albeit temporary).**

	Without enhancement	With enhancement
<b>Extent</b>	National (5)	National (5)
<b>Duration</b>	Short-term (2)	Short-term (2)
<b>Magnitude</b>	High (8)	High (8)
<b>Probability</b>	Definite (5)	Definite (5)
<b>Significance</b>	<b>High (75)</b>	<b>High (75)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Medium	Medium
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes (enhance)	Yes

**Mitigation:**

- » Organise local community meetings to advise the local labour on the project that is planned to be established and the jobs that can potentially be applied for.
- » Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.

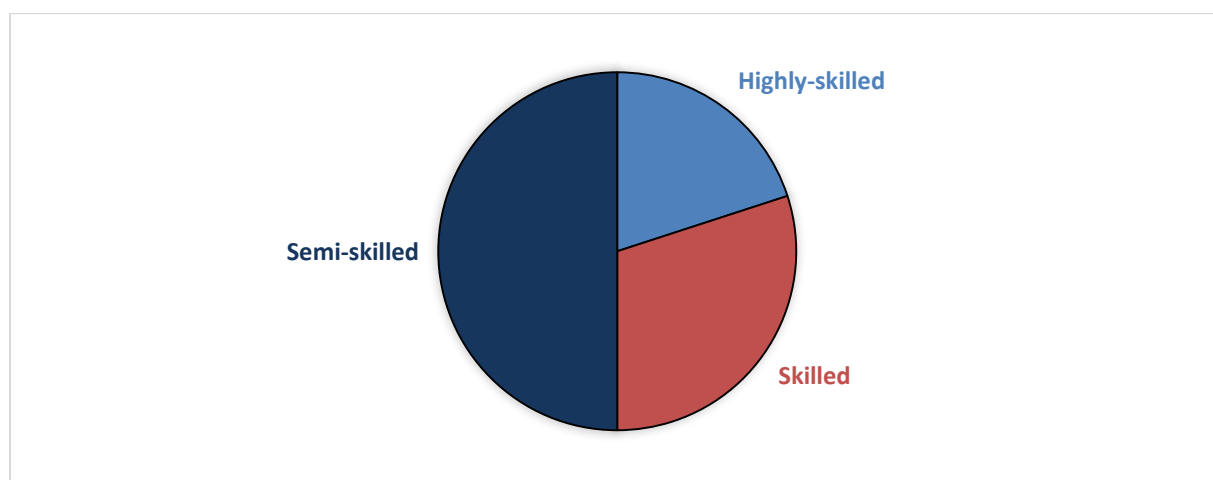
**Residual Risks:**

No residual risks are applicable.

**5.1.4 Positive impact on skills development**

Skills are imperative for satisfying job requirements and adequately performing tasks that ultimately boost the economy. The construction of the CCPP requires a variation of skill sets ranging from semi-skilled construction workers to highly skilled engineers. It is

envisaged that 4 367 jobs will be created. From this, about 800 jobs are for highly skilled employees such as supervisors, just over 1 300 are for skilled employees such as machine operators and over 2 000 are for semi-skilled or unskilled employees.



**Figure 5-1: Skill sets proportions for construction of CCPP**

Employees who are new to the market will develop and attain new skills, whilst workers adept in particular skills will sharpen their abilities. In addition, the employees will improve their marketability for future employment and will be perceived positively by future employers. The plant construction will improve the current status of 47% semi-skilled employees and 25% skilled employees in the City of uMhlathuze Municipality. Although the construction phase will be temporary, the impact on skills is sustainable and notable.

<b>Nature:</b>		
<b>Employees will develop and enhance skills thereby increasing experience and knowledge.</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	Regional (3)	Regional (3)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Definite (5)	Definite (5)
<b>Significance</b>	<b>High (70)</b>	<b>High (70)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Low	Low
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>» In order to maximise the positive impact, it is suggested that the project company provide training courses for employees where feasible to ensure that employees gain as much as possible from the work experience.</li> <li>» Facilitate the transfer of knowledge between experienced employees and the staff.</li> <li>» Perform a skills audit to determine the potential skills that could be sourced in the area.</li> </ul>		



**Residual Risks:**

No residual risks are applicable.

**5.1.5 Positive impact on household income and improved standard of living**

Over a third of the population of the City of uMhlathuze Municipality are classified as low-income earners. The employment creation during the construction period will temporarily increase affected households' income to the value of R5 719 million in 2017 prices.

Employed individuals will increase the income of their respective households and therefore improve their standard of living for a period of three years. In the context of the proposed power plant, workers employed in the construction as well as their households can expect an improvement in their quality of life and standard of living.

**Table 5-4: Impact on household income during construction (R million, 2017 prices)**

	Direct	Indirect	Induced	Total	
<b>Agriculture</b>	R0	R4	R53	R57	1%
<b>Mining</b>	R0	R58	R10	R68	1%
<b>Manufacturing</b>	R0	R1 110	R315	R1 425	25%
<b>Electricity</b>	R0	R345	R15	R360	6%
<b>Water</b>	R0	R3	R9	R12	0%
<b>Building and Construction</b>	R1 673	R421	R29	R2 123	37%
<b>Trade and accommodation</b>	R0	R420	R212	R632	11%
<b>Transport and storage</b>	R0	R160	R167	R327	6%
<b>Financing</b>	R0	R49	R170	R219	4%
<b>Real estate and business services</b>	R0	R186	R179	R365	6%
<b>Government and other services</b>	R0	R52	R78	R130	2%
<b>Total</b>	<b>R1 673</b>	<b>R2 808</b>	<b>R1 237</b>	<b>R5 719</b>	<b>100%</b>

Urban-Econ calculations based on data supplied by client

Businesses supplying inputs to the plant's construction are expected to benefit indirectly to the amount of R2 808 million. As seen in Table 5-4 above, household income as relating to all sectors nationwide will realize levels rise; however, households associated with the building and construction, manufacturing and real estate and business service sectors are expected to experience the greatest gains. Lastly, due to an increase in household consumption-induced through the creation of direct and indirect employment opportunities, an additional R1 237 million will be earned by households in South Africa.

**Nature:**

**Employed individuals will increase the income of their respective households and thereby experience an improvement in their standard of living.**

	Without enhancement	With enhancement
<b>Extent</b>	National (5)	National (5)
<b>Duration</b>	Short-term (2)	Short-term (2)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Definite (5)	Definite (5)
<b>Significance</b>	<b>High (65)</b>	<b>High (65)</b>
<b>Status (positive or negative)</b>	Positive	Positive

<b>Reversibility</b>	Medium	Medium
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes (enhance)	Yes
<b>Mitigation:</b>		
» Local employment will benefit local households and the local area.		
<b>Residual Risks:</b>		
No residual risks are applicable.		

### 5.1.6 Demographic shift due to influx of migrant labour

The current population size in the City of uMhlathuze Municipality is over 350 000, and the population growth has been stagnant, growing at an average of 1% over the past 10 years. A significant number of employees (>4 000) are expected to fill vacancies and conduct construction phase duties for the CCPP. The job opportunities will most likely trigger in-migration and, therefore, it can be suggested that a slight positive shift in the demographics will ensue as a result of the proposed project. Resultantly, migrant workers and job seekers will increase the current population size and possibly increase the male population if an expected male-dominated influx occurs. Furthermore, Richards Bay is largely a working town with numerous migrant workers; thus, the proposed project will exacerbate this status.

Several advantages exist as a result of these demographic changes in the City of uMhlathuze Municipality. These include economic benefits such as increased prosperity and standards of living through the delivery of a better-skilled labour force and a more youthful population. These changes can also stimulate the economy due to increased purchasing power from migrant labour. Demographically, however, increasing male-dominated populations also bring about social ills such as increased prevalence of alcoholism and prostitution.

<b>Nature:</b>		
<b>An impact on the demographics of the area as a result of in-migration in response to job opportunities will occur.</b>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Regional (3)	Regional (3)
<b>Duration</b>	Short duration (2)	Short duration (2)
<b>Magnitude</b>	Moderate (6)	Low (4)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	<b>Medium (33)</b>	<b>Low (27)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Medium	Medium
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes	Yes

**Mitigation:**

- » Where feasible, effort must be made to employ local labour in order to create maximum benefit for the communities and limit in-migration.
- » Train unemployed local community members with insufficient skills and increase absorption of local labour thereby decreasing in-migration.

**Residual Risks:**

A minimal amount of migrant labour will not be employed by the proposed project.

**5.1.7 Increase in demand for housing**

The construction of the CCPP is expected to draw in migrant workers and job seekers. Therefore, an increase in the demand for housing may ensue. However, the current housing backlog of over 60 000 units in the City of uMhlathuze Municipality indicates additional strain that will be placed on the housing market. Moreover, the current 5 100 informal dwellings may possibly proliferate if migrant workers do not find the means to sustain themselves (i.e. paid job). An additional issue raised by municipal officials is the shortage of suitably located land for housing development. Nonetheless, rental housing in Richards Bay and Empangeni has been prioritised as stipulated in the City of uMhlathuze Municipality Integrated Development Plan (uMhlathuze LM, 2016).

**Nature:**

**The construction of CCPP may have a negative impact on the physical capital of the area by placing strain on the housing market.**

	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Regional (3)	Regional (3)
<b>Duration</b>	Short duration (2)	Short duration (2)
<b>Magnitude</b>	Low (4)	Minor (2)
<b>Probability</b>	Highly probable (4)	Probable (3)
<b>Significance</b>	<b>Medium (36)</b>	<b>Low (21)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Medium	High
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes	Yes

**Mitigation:**

- » Communication and collaboration with the City of uMhlathuze Municipality in ensuring that additional housing is planned in areas that are accessible from the project site is to take place.
- » Hiring people who reside within the area will decrease demand for new houses by migrant labour.
- » Utilising housing which comes available from the completion of other construction in the area would minimise the impact.

**Residual Risks:**

No residual risks are applicable.

### 5.1.8 Pressure on basic services, social facilities and economic infrastructure

The state of service delivery in the City of uMhlathuze Municipality is satisfactory with minor backlogs. Secondary data indicates that the key issues include water scarcity and maintenance of electrical lines. The influx of construction workers and job seekers will create additional demand for basic services and social services. Should the expectation of job creation not be properly managed, the development will increase the strain on government to deliver the required social services. However, in relation to health services, the project site will host a mobile medical facility which will then ease the pressure on local government in this regard.

Furthermore, large-scale projects such as power plants require the movement of significant volumes of construction material as well as machinery and equipment. The transportation of these items places stress on road infrastructure – potentially causing roads to deteriorate. The state of road infrastructure in the municipality is rated as poor to fair. The road leading to the proposed project site, the R34, hosts numerous heavy vehicles travelling to and from industries and beyond the project area. Therefore, the establishment of the power plant will further increase the traffic along the R34 road, which could lead to the further deterioration of road infrastructure. Should the roads not receive the maintenance required, the increased traffic will contribute to increased and accelerated degradation of local road infrastructure.

<b>Nature:</b>		
<b>Pressure on basic services, social facilities and economic infrastructure may occur due to increased demand from migrant labour and job seekers.</b>		
	<b>Without mitigation</b>	<b>With mitigation</b>
<b>Extent</b>	Regional (3)	Regional (3)
<b>Duration</b>	Short duration (2)	Short duration (2)
<b>Magnitude</b>	Moderate (6)	Low (4)
<b>Probability</b>	Probable (3)	Improbable (2)
<b>Significance</b>	<b>Medium (33)</b>	<b>Low (18)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	High	High
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>» Clearly inform the local municipality of the potential impact of the proposed project in order for the necessary preparations to take place.</li> <li>» Provide public transportation service for workers in order to reduce congestion on roads.</li> <li>» Partner with local municipalities and other prominent users of the local roads to upgrade them to meet the required capacity and intensity of the vehicles related to the planned construction activities.</li> </ul>		
<b>Residual Risks:</b>		
No residual risks are applicable.		

## 5.2 Impacts ensued during operations

### 5.2.1 Impact on production

Once operational, it is estimated that the proposed CCPP will stimulate production to the value of around R911 million. It should be noted that this excludes the total revenue to be generated by the plant considering the electricity tariff and includes only the impact that will be stimulated as a result of the plant's operational expenditure. Due to the backward linkages and the multiplier effect associated with the consumption induced impacts, for every R1 of revenue generated by the plant directly, it will create an additional R2.62 million in the rest of the South African economy. Therefore, the total annual impact on the production in the country will amount to R2 388 million per annum.

- The power plant will have to acquire inputs from a variety of sectors such as trade and accommodation, transport and storage, and government services. These additional new business sales averaging R1 098 million (2017 prices) per year, will be created as a result of the indirect multiplier effect stimulated by operating activities of the plant. According to Table 5-5, transport and storage followed by manufacturing will experience the largest increase in production due to stimulus.
- The upsurge in household expenditure in the country, induced by the plant's activities, will further generate R380 million (2017 prices) per annum. This expenditure pattern of households in South Africa will cause the manufacturing and real estate and business services to experience the largest increase in demand for their products and services.

Considering that the CCPP will be located in the City of uMhlathuze Municipality and assuming that the entire production value will be accounted as part of the output of the municipality, the size of the City of uMhlathuze Municipality's economy is expected to increase significantly.

**Table 5-5: Impact on production during operations**

	Direct	Indirect	Induced	Total	
<b>Agriculture</b>	R0	R4	R18	R23	1%
<b>Mining</b>	R0	R13	R3	R16	1%
<b>Manufacturing</b>	R0	R269	R142	R412	17%
<b>Electricity</b>	R911	R30	R4	R945	40%
<b>Water</b>	R0	R5	R4	R9	0%
<b>Building and Construction</b>	R0	R26	R11	R37	2%
<b>Trade and accommodation</b>	R0	R133	R42	R175	7%
<b>Transport and storage</b>	R0	R478	R50	R528	22%
<b>Financing</b>	R0	R25	R33	R58	2%
<b>Real estate and business services</b>	R0	R105	R62	R167	7%
<b>Government and other services</b>	R0	R9	R11	R20	1%
<b>Total</b>	<b>R911</b>	<b>R1 098</b>	<b>R380</b>	<b>R2 388</b>	<b>100%</b>

Urban-Econ calculations based on data supplied by client

#### **Nature:**

**Expenditure associated with the operation of the proposed development will have a positive impact on production.**

	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	National (5)	National (5)
<b>Duration</b>	Long-term (4)	Long-term (4)

<b>Magnitude</b>	Moderate (6)	High (8)
<b>Probability</b>	Highly probable (4)	Highly probable (4)
<b>Significance</b>	<b>High (60)</b>	<b>High (68)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Medium	Medium
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes (enhance)	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>» The project developer should make effort to use locally sourced inputs where feasible in order to maximize the benefit to the local economy.</li> <li>» Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible.</li> </ul>		
<b>Residual Risks:</b>		
No residual risks are applicable.		

### 5.2.2 Impact on GDP

The operating expenditure incurred by the CCPP will translate into R627 million (2017 prices) of gross domestic product (GDP) through direct and spin-off effects. As may be viewed in Table 5-6 below, direct expenditure plays a crucial role in the growth of GDP, with the electricity sector increasing by an estimated R31 million in the local municipality. Furthermore, the production-induced impact is forecast to raise annual GDP by an average of R451 million per annum; while the consumption-induced effect will see to a further expansion of GDP by R145 million per annum.

**Table 5-6: Impact on GDP during operations**

	Direct	Indirect	Induced	Total	
<b>Agriculture</b>	R0	R2	R8	R10	2%
<b>Mining</b>	R0	R6	R1	R8	1%
<b>Manufacturing</b>	R0	R68	R32	R101	16%
<b>Electricity</b>	R31	R15	R2	R48	8%
<b>Water</b>	R0	R2	R1	R3	0%
<b>Building and Construction</b>	R0	R6	R2	R8	1%
<b>Trade and accommodation</b>	R0	R67	R21	R88	14%
<b>Transport and storage</b>	R0	R212	R21	R234	37%
<b>Financing</b>	R0	R18	R24	R42	7%
<b>Real estate and business services</b>	R0	R48	R25	R73	12%
<b>Government and other services</b>	R0	R6	R7	R13	2%
<b>Total</b>	<b>R31</b>	<b>R451</b>	<b>R145</b>	<b>R627</b>	<b>100%</b>

Urban-Econ calculations based on data supplied by client

It is evident that the transport and storage and manufacturing sectors are the dominant beneficiaries of the project's operations and will comprise of 53% of all value added stimulated by the project through its direct and multiplier effects. In summation, the greater the value of goods and services procured by the plant during its operations from the local economy, the greater the overall economic benefit for the local municipality.

<b>Nature:</b> <b>Positive impact on GDP due to operating expenditure during operations.</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	National (5)	National (5)
<b>Duration</b>	Long-term (4)	Long-term (4)
<b>Magnitude</b>	Moderate (6)	High (8)
<b>Probability</b>	Highly probable (4)	Highly probable (4)
<b>Significance</b>	<b>High (60)</b>	<b>High (68)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Medium	Medium
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes (enhance)	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>» The project developer is to make an effort to use locally sourced inputs where feasible in order to maximize the benefit to the local economy.</li> <li>» Local Small and Medium Enterprises are to be approached to investigate the opportunities for supplying inputs required for the maintenance and operation of the facility, as far as feasible.</li> </ul>		
<b>Residual Risks:</b>		
No residual risks are applicable.		

### 5.2.3 Employment creation

The proposed power plant will create around 90 employment opportunities. A portion of this labour will be sourced from the City of uMhlathuze Municipality while the rest can be expected to be sourced from KwaZulu-Natal and the rest of South Africa. The current labour participation rate is 58% in the City of uMhlathuze Municipality. The operations of the CCPP will therefore increase the number of employed working age individuals, thus slightly combating local unemployment. The electricity sector currently absorbs 0.3% (392 people) of the total employed in the area; therefore, the created employment opportunities at the CCPP will assist in increasing the electricity sector's labour absorption in the municipality.

In addition to the direct jobs created on site, the power plant will also stimulate the creation of 2 523 sustainable employment opportunities through production and consumption induced impacts. Overall, a total contribution of the project towards sustainable employment creation in South Africa will be 2 613 jobs that will be supported. Jobs created during operations through multiplier effects will be distributed among all economic sectors. The largest number of jobs will be created in the transport and storage, and trade and accommodation sectors. The employment created will be for a sustainable period of 25 years.

	Direct	Indirect	Induced	Total	Percentage (Total)
<b>Agriculture</b>	0	29	131	160	6%
<b>Mining</b>	0	5	1	6	0%
<b>Manufacturing</b>	0	215	111	325	12%
<b>Electricity</b>	90	16	2	108	4%
<b>Water</b>	0	3	2	5	0%

<b>Building and Construction</b>	0	95	38	133	5%
<b>Trade and accommodation</b>	0	555	177	732	28%
<b>Transport and storage</b>	0	725	51	776	30%
<b>Financing</b>	0	25	32	57	2%
<b>Real estate and business services</b>	0	105	62	166	6%
<b>Government and other services</b>	0	62	82	143	5%
<b>Total</b>	<b>90</b>	<b>1 833</b>	<b>689</b>	<b>2 613</b>	<b>100%</b>

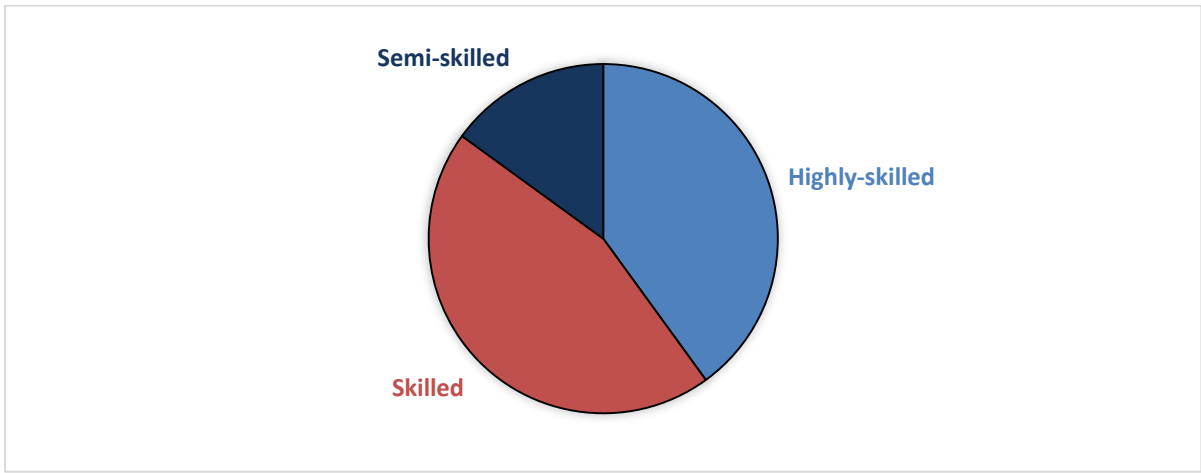
Urban-Econ calculations based on data supplied by client

<b>Nature:</b>		
<b>The operation of the combined cycle power plant will positively impact on the community and beyond by creating a number of job opportunities.</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	National (5)	National (5)
<b>Duration</b>	Long-term (4)	Long-term (4)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Definite (5)	Definite (5)
<b>Significance</b>	<b>High (75)</b>	<b>High (75)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Low	Low
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes (enhance)	Yes
<b>Mitigation:</b>		
» Where feasible, effort must be made to employ locally in order to create maximum benefit for the communities.		
<b>Residual Risks:</b>		
No residual risks are applicable.		

#### 5.2.4 Impact on skills development

The specialty of the CCPP requires and creates scarce skills that will be imperative in the long run if other CCPPs are developed as envisaged in policy. 90 jobs are planned to be created for the operations of the CCPP. From this, 30-40 jobs are to be filled by highly skilled employees, 40-45 jobs are meant for skilled workers and the remaining 10-15 are dedicated to semi-skilled or unskilled employees.





**Figure 5-2: Skills proportions required for CCPP Operations**

The employment opportunities are for a long-term period of 25 years and are thus sustainable and will have a positive impact on skills for benefitting employees. Furthermore, as production and consumption effects filter through the economy creating a demand for more labour, human resources will be trained and skilled within aligned industries. Ultimately, the plant's construction will lead to enhanced skills through training and experience in the wider national economy.

<b>Nature:</b>		
<b>Employees will develop and enhance skills thereby increasing experience and knowledge.</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	Local (2)	Local (2)
<b>Duration</b>	Permanent (5)	Permanent (5)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Definite (5)	Definite (5)
<b>Significance</b>	<b>High (70)</b>	<b>High (70)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Low	Low
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes	Yes
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>» In order to maximise the positive impact, it is suggested that the project company provide training courses for employees where feasible to ensure that employees gain as much as possible from the work experience.</li> <li>» Facilitate the transfer of knowledge between experienced employees and the local staff.</li> <li>» Perform a skills audit to determine the potential skills that could be sourced in the area.</li> <li>» Where possible train and empower local communities for employment in the operations of the power plant.</li> </ul>		
<b>Residual Risks:</b>		
No residual risks are applicable.		

### 5.2.5 Positive impact on household income and improvement in standard of living

For a period of 25 years, 90 people will be employed at the power plant. As a result, the benefitting individuals and their respective households will incur an improvement in their standard of living due to the income earned. The income earned also results in increased purchasing power in the local community, given that a proportion of the employed will be based in the municipality. Therefore, the local businesses will experience increased business activity and the local economy will experience a boost.

	Direct	Indirect	Induced	Total	Percentage (Total)
Agriculture	-	0,57	2,47	3,04	1%
Mining	R0	R2	R0	R3	1%
Manufacturing	R0	R31	R15	R46	17%
Electricity	R32	R5	R1	R38	14%
Water	R0	R1	R0	R1	0%
Building and Construction	R0	R3	R1	R5	2%
Trade and accommodation	R0	R32	R10	R42	16%
Transport and storage	R0	R77	R8	R85	32%
Financing	R0	R6	R8	R14	5%
Real estate and business services	R0	R16	R8	R25	9%
Government and other services	R0	R3	R4	R6	2%
<b>Total</b>	<b>R32</b>	<b>R178</b>	<b>R58</b>	<b>R268</b>	<b>100%</b>

Urban-Econ calculations based on data supplied by client

<b>Nature:</b>		
<b>Employed individuals will increase the income of their respective households and therefore improve their standard of living.</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	National (5)	National (5)
<b>Duration</b>	Long-term (4)	Long-term (4)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Definite (5)	Definite (5)
<b>Significance</b>	<b>High (75)</b>	<b>High (75)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Medium	Medium
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes	Yes
<b>Mitigation:</b>		
» Employing locally will increase benefit to local households and the local area.		
<b>Residual Risks:</b>		
No residual risks are applicable.		

### 5.2.6 Impact on government revenue

The proposed development will provide a sustainable and increased revenue to the local government in the form of property rates and taxes. It will further supplement the revenue derived from national government. Moreover, national government will derive tax-related revenue such as Value-Added Tax (VAT), payroll and income taxes. This is as a result of the employment that will be created and the resultant income that will be earned, thus increasing spending power. As stated previously, the housing backlog and service delivery

require attention. Therefore, the increased revenue from the proposed project may assist the municipality whereby constituencies may utilise it for public services. Overall, the allocation of government revenue should improve socio-economic conditions of the population.

<b>Nature:</b> <b>Government revenue will be derived from the proposed development.</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	Municipal (3)	Municipal (3)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Definite (5)	Definite (5)
<b>Significance</b>	<b>High (65)</b>	<b>High (65)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Medium	Medium
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	No	No
<b>Mitigation:</b> No mitigation measures are required.		
<b>Residual Risks:</b> No residual risks are applicable.		

### **5.2.7 Improvement in the energy generation sector**

The CCPP will provide the important national service of providing new electricity capacity into the national grid. Strategically, the proposed project will assist in improving electricity security and reducing transmission losses in the national grid. According to the CCPP's motives, the project aims to:

- \* To make up for the mortality rate of the old ageing infrastructure
- \* To provide new electricity capacity for South Africa
- \* To avoid transmission investment and reduce transmission losses by having a generation centre in KwaZulu-Natal
- \* To provide back-up generation for renewables
- \* To reduce Eskom's carbon footprint per unit of electricity produced, as power plants using natural gas emit approximately half the carbon of coal-fired power plants while using considerably less water, thus supporting Government's commitment to reduce carbon emissions
- \* To support government's energy objective of diversifying South Africa's energy mix
- \* To enable a new feed stock for the stimulation of new industry
- \* To take advantage of huge gas discoveries in the Rovuma basin of Mozambique thereby gaining access to reasonably priced gas and utilising a regional resource for the benefit of the region (Eskom, 2016).

In addition, the ability and operational flexibility is to be ramped up or down to suit the system demand on an hourly or daily basis, will additionally increase efficiency. Lastly, the

proposed development will contribute towards gas infrastructure and will therefore help alleviate one of the challenges facing the industry.

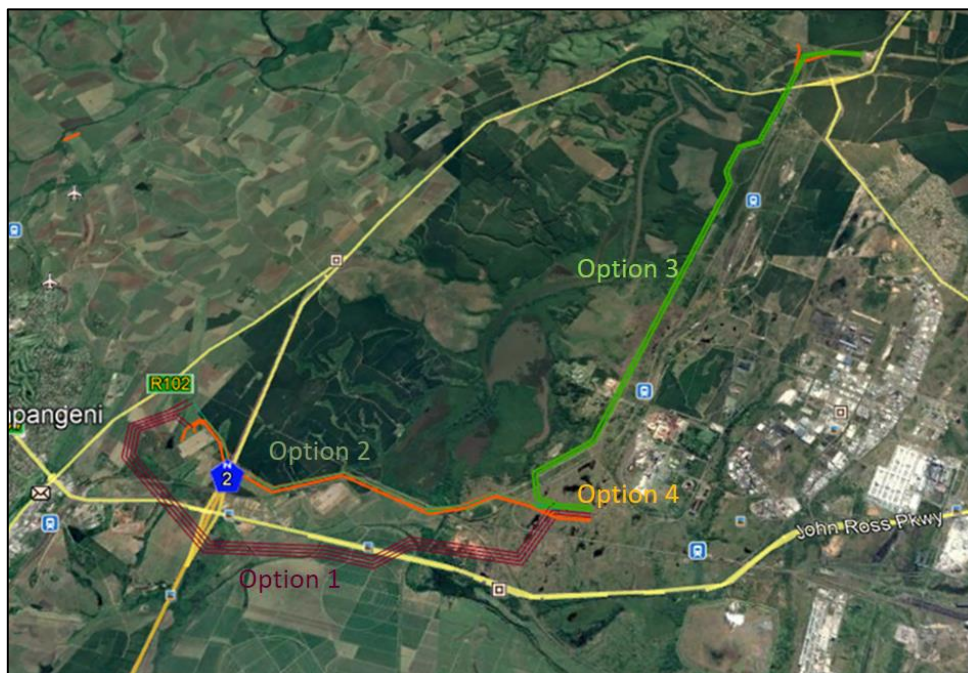
<b>Nature:</b> <b>Improved energy security and energy sector will result due to the development of the Closed Cycle Power Plant.</b>		
	<b>Without enhancement</b>	<b>With enhancement</b>
<b>Extent</b>	National (5)	National (5)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Highly probable (4)	Highly probable (4)
<b>Significance</b>	<b>High (60)</b>	<b>High (60)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Low	Low
<b>Irreplaceable loss of resources?</b>	Yes	Yes
<b>Can impacts be mitigated?</b>	No	No
<b>Mitigation:</b> No mitigation measures are required.		
<b>Residual Risks:</b> No residual risks are applicable.		

## 6. CUMULATIVE IMPACT ANALYSIS

### 6.1 Existing and planned development near proposed project area

A number of existing and planned developments could be identified that will create the conditions for cumulative effect. These existing and planned developments of industrial nature are described further in this section.

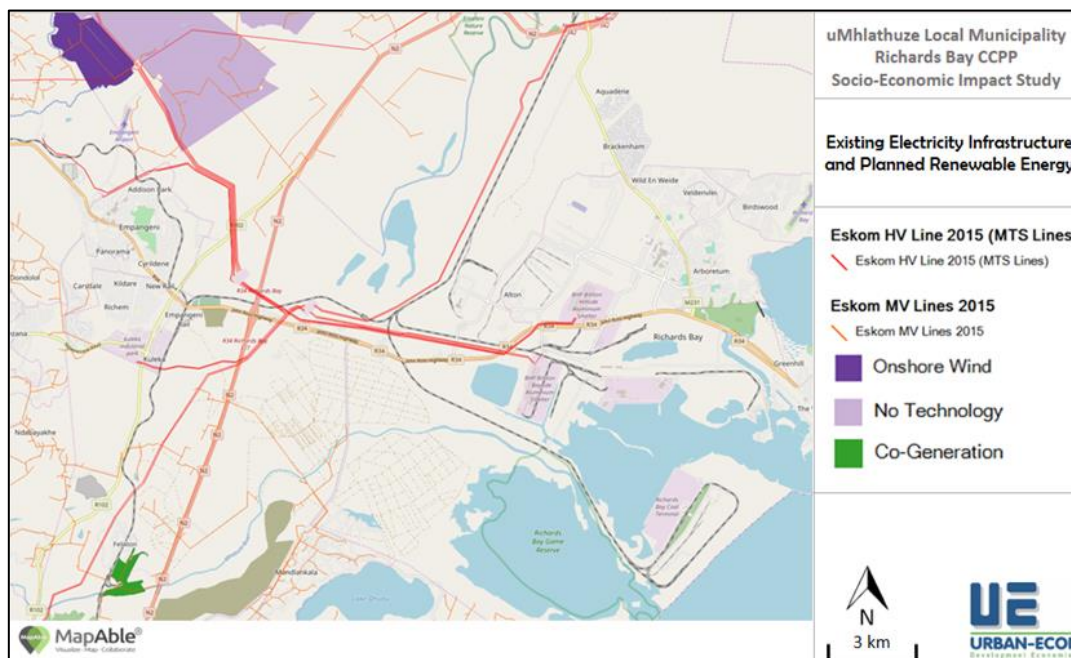
The proposed project envisages to have a transmission power line connecting it to the grid. Map 6-1 below indicates the possible route options that are considered for the connection of the facility to the grid. Whichever option is selected, it will contribute to the cumulative impact of the proposed project.



**Map 6-1: Four power line options for connection to grid and to facility**

The manner in which a proposed project will affect the zone of influence is also dependent on the baseline conditions of that environment, which includes other proposed projects. Such projects, depending on their timing in relation to the project which is subject of this EIA, may influence the manifestation and significance of socio-economic impacts that could result from the current project. As such, knowledge of such projects is required in order to accurately predict and rate socio-economic impacts.

The existing electricity infrastructure is demonstrated in Map 6-2 below.



**Map 6-2: Existing Electricity Infrastructure and Planned Renewable Energy (Source: Mapable)**

High Voltage (HV) power lines run through the south and west of the proposed project site. The proposed project will augment the current infrastructure. Below are additional recent and planned energy projects.

The recent Richards Bay Wind Energy Facility is located towards the north west of the project site (Coastal and Environmental Services, 2014). In addition, a floating power plant is envisaged to be located within the Port of Richards Bay. From the existing and planned developments, the common and significant impacts that have been identified and analysed in respective impact assessment studies or referred to in other public documents, are noted below.

**Table 6-1: Socio-economic impacts identified to be associated with the other projects in the zone of influence of the facility under review**

Socio- Economic Parameter	Description/Impact	Rating by Specialist	Identified Importance
Health risks	<b>Richards Bay Wind Energy Project</b> Health risks due to pollutants during construction (Coastal and Environmental Sciences, 2014)	Moderate negative	Moderate Negative
	<b>Floating power-plant</b> Health due to air emissions (IPPP, 2015)	-	
	<b>Mondi Factory</b> Possibility of health effects on employees in surrounding industry due to air pollutants.	-	
Increased noise levels	<b>Richards Bay Wind Energy Project</b> Noise impacts during construction (Coastal and Environmental Sciences, 2014).	Low negative	

Socio- Economic Parameter	Description/Impact	Rating by Specialist	Identified Importance
	<b>Floating power-plant</b> Possible noise due to equipment and machinery operations (IPPP, 2015).	-	Low negative
Demographic shifts	<b>Floating power plant</b> Increase in population due to influx of migrant labor and job seekers (IPPP, 2015).	-	Medium Negative
	<b>Closed Cycle Power Plant (CCPP)</b> Increase in population due to influx of migrant labor and job seekers.	Medium negative	

In addition to the negative cumulative impacts noted above, numerous positive impacts are expected to accumulate in the region such as increased production, GDP, employment, skills and household income.

The following tables summarise and rate the expected cumulative effects.

<b>Nature:</b> Increase in production and creation of employment opportunities.		
	Cumulative Contribution of proposed project	Cumulative Impact without proposed project
<b>Extent</b>	Regional (3)	Regional (3)
<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	High (8)	High (8)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	<b>Medium (45)</b>	<b>Medium (45)</b>
<b>Status (positive or negative)</b>	Positive	Positive
<b>Reversibility</b>	Low	Low
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes	Yes
<b>Confidence in findings</b>	High	
<b>Mitigation:</b> No mitigation measures are required.		

<b>Nature:</b> Potential health risks due to cumulative air emissions of existing industry and planned projects.		
	Cumulative Contribution of proposed project	Cumulative Impact without proposed project
<b>Extent</b>	Regional (3)	Regional (3)

<b>Duration</b>	Long term (4)	Long term (4)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Probable (3)	Probable (3)
<b>Significance</b>	<b>Medium (39)</b>	<b>Medium (39)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Medium	Medium
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes	Yes
<b>Confidence in findings</b>	Medium	
<b>Mitigation:</b> Adhere to air specialist's recommendations.		

<b>Nature:</b> Influx of migrant labour and job seekers due to job opportunities presented by numerous projects.		
	<b>Cumulative Contribution of proposed project</b>	<b>Cumulative Impact without proposed project</b>
<b>Extent</b>	Regional (3)	Regional (3)
<b>Duration</b>	Medium term (3)	Medium term (3)
<b>Magnitude</b>	Moderate (6)	Moderate (6)
<b>Probability</b>	Highly probable (4)	Highly probable (4)
<b>Significance</b>	<b>Medium (48)</b>	<b>Medium (48)</b>
<b>Status (positive or negative)</b>	Negative	Negative
<b>Reversibility</b>	Medium	Low
<b>Irreplaceable loss of resources?</b>	No	No
<b>Can impacts be mitigated?</b>	Yes	
<b>Confidence in findings</b>	High	
<b>Mitigation:</b>		
<ul style="list-style-type: none"> <li>» Where feasible, effort must be made to employ local labour in order to create maximum benefit for the communities and limit in-migration.</li> <li>» Provide training for unemployed local community members with insufficient skills and thus increase absorption of local labour thereby decreasing in-migration.</li> <li>» Manage recruitment and marketing for vacancies with a preference of residents within the municipality.</li> </ul>		



## 7. CONCLUSION

Eskom is proposing to develop a Combined Cycle Power Plant (CCPP) with a generation capacity of 3 000 MW. The project is planned to be located in Richards Bay within the KwaZulu-Natal Province. The proposed site will directly affect portion 2 and portion 4 of erf 11376, which forms part of phase 1D of the Richards Bay Industrial Development Zone.

The review of key national, provincial and local policy documents indicates that the development of a gas to power project is supported at all levels. The Integrated Resource Plan (IRP) for Electricity 2010-2030 asserts that the use of natural gas presents the greatest potential in the energy mix. In addition, a clear target for the development of the CCPP plant is made in the IRP and the KwaZulu-Natal Provincial Growth and Development Plan (PGDP). After considering the reviewed documentation, no fatal flaws or contraventions from a socio-economic policy perspective exist for the implementation of the proposed project.

The City of uMhlatuze Municipality is a key local municipality in the King Cetshawyo District Municipality in terms of GDP contribution. The municipality, as a port city, demonstrates the co-existence of industrial and agricultural activity. Richards Bay is particularly a working town where employment is concentrated. The compounded annual growth rate (CAGR) in the City of uMhlatuze Municipality is similar to that of the district and province. The electricity, gas and water economic sector currently contribute the least to the GDP of the municipality. The unemployment rate is close to a third of the labour force.

The above suggests that the economy can utilise the investment to diversify its economic base and lead to the improvement of standards of living among local households through the increased income levels and access to improved services, which can be achieved by raising the local municipality's revenue base through taxes and rates paid by new businesses. The proposed project is therefore likely to create a positive impact on the local economic development and the socio-economic environment in the municipality in general. The table below surmises the socio-economic impacts and evidently, the key concerns and negative impacts are solely derived from the influx of migrant labour and job seekers. Overall, numerous positive socio-economic impacts will ensue as a result of the CCPP.

**Table 7-1: Summary of impacts and significance rating per impact**

<b>Impact</b>	<b>Status</b>	<b>Significance before mitigations</b>
<b>Construction Phase</b>		
Increase in production	Positive	High (60)
Increase in GDP	Positive	Medium (52)
Employment creation	Positive	High (75)
Skill development	Positive	High (70)
Increase in household income	Positive	High (65)

<b>Impact</b>	<b>Status</b>	<b>Significance before mitigations</b>
Demographic shifts due to influx of migrant labour	Negative	Medium (33)
Increase in housing demand	Negative	Medium (36)
Pressure on basic services, social facilities and economic infrastructure	Negative	Medium (33)
<b>Operation Phase</b>		
Increase in production	Positive	High (60)
Increase in GDP	Positive	High (60)
Employment creation	Positive	High (75)
Skill development	Positive	High (70)
Increase in household income	Positive	High (75)
Increase in government revenue	Positive	High (65)
Energy security	Positive	High (60)
<b>Cumulative Impacts</b>		
Production, GDP and employment	Positive	Medium (45)
Health risks	Negative	Medium (39)
Influx of migrant labour and job seekers	Negative	Medium (48)

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## ANNEXURE A

### Assessment of Impacts

Direct, indirect and cumulative impacts of the issues identified through the scoping study, as well as all other issues identified in the EIA phase must be assessed in terms of the following criteria:

- » The **nature**, which shall include a description of what causes the effect, what will be affected and how it will be affected.
- » The **extent**, wherein it will be indicated whether the impact will be local (limited to the immediate area or site of development) or regional, and a value between 1 and 5 will be assigned as appropriate (with 1 being low and 5 being high):
- » The **duration**, wherein it will be indicated whether:
  - \* the lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - \* the lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - \* medium-term (5–15 years) – assigned a score of 3;
  
  - \* long term (> 15 years) - assigned a score of 4; or
  - \* permanent - assigned a score of 5;
- » The **magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - \* 0 is small and will have no effect on the environment
  - \* 2 is minor and will not result in an impact on processes
  - \* 4 is low and will cause a slight impact on processes
  - \* 6 is moderate and will result in processes continuing but in a modified way
  - \* 8 is high (processes are altered to the extent that they temporarily cease)
  - \* 10 is very high and results in complete destruction of patterns and permanent cessation of processes
- » The **probability of occurrence**, which shall describe the likelihood of the impact actually occurring. Probability will be estimated on a scale of 1–5, where 1 is very improbable (probably will not happen), 2 is improbable (some possibility, but low likelihood), 3 is probable (distinct possibility), 4 is highly probable (most likely) and 5 is definite (impact will occur regardless of any prevention measures).
- » the **significance**, which shall be determined through a synthesis of the characteristics described above and can be assessed as low, medium or high; and
- » the **status**, which will be described as either positive, negative or neutral.
- » the degree to which the impact can be reversed.
- » the degree to which the impact may cause irreplaceable loss of resources.
- » the *degree* to which the impact can be *mitigated*.

The **significance** is calculated by combining the criteria in the following formula:

$$S=(E+D+M)P$$

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The **significance weightings** for each potential impact are as follows:

- » < 30 points: Low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- » 30-60 points: Medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- » > 60 points: High (i.e. where the impact must have an influence on the decision process to develop in the area).

Assessment of impacts must be summarised in the following table format. The rating values as per the above criteria must also be included. Complete a table and associated ratings for **each** impact identified during the assessment.