

Applications for an Environmental Authorisation and a Waste Management Licence for the proposed 80 000 tonne per annum TiO₂ Pigment Plant in the Richard's Bay Industrial Development Zone, KwaZulu Natal

Draft Scoping Report

KZN EDTEA Ref: To be advised

DFFE Ref: To be advised

Report Prepared for

Nyanza Light Metals (Pty) Ltd



Report Number 585503/Draft Scoping Report

Report Prepared by



July 2022

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Executive Summary

Introduction

SRK Consulting (SA) (Pty) Ltd (SRK) has been appointed by Nyanza Light Metals (Pty) Ltd (Nyanza) as the independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Authorisation (EA), Waste Management Licence (WML), Atmospheric Emission License (AEL), and Water Use License (WUL) application processes for the proposed construction and operation an 80 000 tonne per annum (tpa) Titanium Dioxide (TiO₂) Pigment Plant in Phase 1F of the Richard's Bay Industrial Development Zone (RBIDZ).

The reports and documentation for the EA and WML application processes will be compiled and finalised for submission to the KwaZulu-Natal Department of Economic Development, Tourism, and Environmental Affairs (KZN EDTEA) and the Department of Forestry, Fisheries and the Environment, (DFFE), respectively, for consideration and decision making. Where required, the KZN EDTEA and DFFE will consult with other government authorities as required in terms of Section 24(K) of the NEMA.

Who will evaluate the EIA/EMPr?

Before the proposed development can proceed, approval has to be obtained from the KZN EDTEA and DFFE. The proposed project triggers activities listed in terms of Listing Notices 1 (Activity 25) and Listing Notice 2 (Activities 1, 4, and 6) and Listing Notice 3 (Activities 2 and 14) of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA) (as amended) and will require an EA from the EDTEA. In addition, the proposed project triggers activities listed in Government Notice Regulation (GNR) 921 of the National Environmental Management: Waste Act, 2008 (Act 58 of 2008) (Category B Activities 3, 4, and 10 and Category C Activity 2) and will require a WML from DFFE. Since the project triggers activities in Listing Notice 2 of the NEMA and category B of the NEM: WA, a full Environmental Impact Assessment (EIA) including Scoping and Impact Assessment will be followed as stipulated in Government Notice Regulation (GNR) 326 of the NEMA, as amended.

This Scoping Report and Plan of Study (PoS) will be submitted to the KZN EDTEA and DFFE, will then advise the project team as to how the project should proceed for the impact assessment phase of the project.

The impact assessment phase will entail detailed specialist investigations, reporting and further stakeholder involvement. Only once a Final Environmental Impact Assessment Report (EIR) and Environmental Programme (EMPr) have been submitted to the KZN EDTEA and DFFE, can a decision be taken by the Departments as to whether the project may proceed or not.

Description of the Proposed Development

Solar Plant, Water Extraction, and Bottling Plant

Approximately 5.7 ha of erf 16789 will be set aside for the "Green Park". This site will be used for air-to-water installations along with a bottling plant. The site will also be used for the installation of a ground-mount solar plant.

The air-to water installation's purpose is to supply the Nyanza Technical Services Centre (TSC) with water and to create a business opportunity to involve a local entrepreneur to extract atmospheric moisture and bottle this water for sale into the local Richards Bay market. Installation of the air-to-water process will be conducted in two phases. Phase 1 will supply the TSC with water, while Phase 2 will supply the bottling plant with water, including the bottling plant.

Ground-mount solar panels will be installed on the remainder of the Green Park (approximately 4.9ha). The general rule for the solar installations is 1 ha per 1 Mega Watt (MW) resulting in space for approximately 4.5 MW ground-mounted solar panels.

Areas where the solar panels will be installed include the roofs of the air-to-water plant's gable structures and the roof of the bottling plant.

Nyanza 80 000 tpa TiO₂ Pigment Plant

The Project will produce 80 000 tpa titanium dioxide (TiO₂) pigment. The expected life of plant is 60 years. Feedstock will be ilmenite (design is based on typical Tellnes ilmenite) and/or conventional sulfatable slag (design is based on typical Richards Bay Mineral slag) and a waste slag from the erstwhile Highveld Steel plant – referred to as Highveld Steel Slag (HSS). Design provision is made for a blend of any proportion of these feedstocks.

The plant will be operated on a 24 hours, 365 days per year basis. Considering unplanned production outages and planned maintenance shuts, the design assumption is that plant on-line time will be 85%. Redundancy provision and emergency power provision is made on all critical abatement equipment to ensure 100% on-line time.

The manufacture of TiO₂ via the sulfate process consists of the manufacture of the pure untreated TiO₂ (referred to as calciner discharge or 'CD') and the deaggregation and surface treatment of the CD (referred to as 'Finishing').

The key stages in the manufacture of CD through sulfate technology are:

- Milling of the feedstock to the optimal size fraction;
- Digestion of the TiO₂ feedstock with sulfuric acid (H₂SO₄);
- Reduction of the ferric iron, Fe³⁺ in the titanyl sulfate solution ('black liquor') to Fe²⁺ with iron (Fe) if needed;
- Formation of adequate titanium ions (Ti³⁺) in the black liquor by further reduction with Fe if needed;
- Oxidation of excess Ti³⁺ in the black liquor if needed;
- Separation of solid impurities from the black liquor;
- Removal of excess Fe from the black liquor and/or removal of excess aluminium from the black liquor and re-concentration of the black liquor (if necessary);
- Preparation of seed crystals ('nuclei') for precipitation in hydrolysis and rutilisation in the calciner;
- Hydrolysis of the titanyl sulfate to form an insoluble hydrous TiO₂ precipitate;
- Washing and bleaching of remaining impurities;
- Conditioning of the hydrous TiO₂ precipitate prior to calcination; and
- Calcination to drive off water and acid and to grow the TiO₂ crystals, yielding pure dry TiO₂.

The TiO₂ that emerges from the calciner will be deaggregated, coated with oxides or hydroxides of aluminium, silicon, phosphorous and/or zirconium and then washed, dried and deagglomerated before packing as a final product.

Ancillary process units included in the scope of the project are:

- scrubbing of digestion and calciner off-gas;
- recovery of titanyl sulfate solution from digester solid residues and neutralisation of the digester solid residues;
- re-concentration of strong waste acid for recycle to the main process;
- neutralisation of remaining waste acid;
- dewatering of gypsum;
- preparation of the surface treatment and calciner addition chemicals; and
- buffer storage facilities in the main TiO₂ plant for copperas and ammonium aluminium sulfate and handling facilities for loading and dispatch of these.

Other process units included in the scope of the project are:

- a sulfur-burning sulfuric acid plant (also supplying steam to the main TiO₂ plant);
- a water demineralisation plant;
- a compressed air plant for plant air and instrument air;
- vacuum generation plant;
- a lime slaking plant;
- water cooling plant(s); and
- a steam boiler(s).

Motivation for the Proposed Project

More than 90% of the rutile and ilmenite TiO₂ feedstock are used for the manufacturing of TiO₂ pigments that are used in industrial paints, coatings, paper, cosmetics, plastics, etc. Currently, Africa imports 130 000 tonnes of TiO₂ pigment per year, while South Africa consumes about 35 000 tonnes (Global Africa Network, 2017). Nyanza will contribute 80 000 tonnes of TiO₂ pigment per annum. The largest quantity will be sold locally, while the remainder will be exported to other countries in Africa and the Middle East.

A technology partnership between Avertana of New Zealand and Nyanza will result in the construction of the 80 000 tpa TiO₂ Pigment Plant in Richards Bay. TiO₂ will be produced from stockpiled waste steel slag to create the pigment. This is the white pigment use most widely across the world (Global Africa Network, 2017).

The 80 000 tpa TiO₂ Pigment Plant will be situated within the Richards Bay Industrial Development Zone (RBIDZ) Phase 1F. Zoning for the RBIDZ is classified as general industrial and the project is in line with the mandate of the RBIDZ to be a purpose-built and secure industrial estate developed specifically to manufacture goods and to produce services to enhance beneficiation, investments, economic growth, job creation, and developing skills (ZO, 2021). This project will bring new technology to South Africa as well, aid the industrialisation programme of the government, and add value to mineral and mining processing value chain of the country (Global Africa Network, 2017).

Construction of the 80 000 tpa TiO₂ Pigment Plant strengthened the purpose to rebuild the economy of KwaZulu-Natal (KZN) after the Covid-19 outbreak caused delays. The destruction of the economy was left in the pandemic's track, resulting in thousands of job losses and companies closing down. Following its mandate, the economic recovery initiatives from the government and with the leadership

of Member of Executive Council (MEC) Pillay, the RBIDZ is now required to speed up energies reserved to create job opportunities for people in the KZN province (ZO, 2021).

Commencing with the construction of investment projects and the persistent partnership between Nyanza and the RBIDZ, will contribute to stimulating and restoring the KZN economy. Local and provincial government parties along with Nyanza and the RBIDZ are pleased by this momentous project which will enhance the position of Richards Bay as the African Continent's Titanium and Minerals Beneficiation Capital (ZO, 2021).

It is expected that the project will lead to the creation of about 1200 jobs during its construction phase and 550 jobs during its operational phase. Approximately 680 of these jobs will be for skilled labourers, while 1 070 of these jobs will be for unskilled labourers. People from the Richards Bay area will be given preference for employment as this will be the most economically viable option. Should the project not proceed, a large negative socio-economic loss will be a consequence for the region.

Alternatives Considered

The alternatives considered include:

- **Site Alternatives:** Two feasible site alternatives were assessed, taking into account proximity to main feedstock, which is near Witbank in Mpumalanga Province, transportation infrastructure / proximity to a port for bulk export of titanium products, availability and suitability of industrial land, infrastructure, services and utilities as well as proximity to key raw materials. The site alternatives considered were:
 - **Alternative 1:** Middleburg as a location was the closest to Highveld Steel and Vanadium resulting in the slag not having to be transported as far; however, the final Titanium product would still have to be transported via railway to Richards Bay Port as this is the closest port. Although there were acceptable transportation options, namely the railway line from Witbank to Richards Bay, Nyanza would still have to install all supporting infrastructure, services and utilities. Furthermore, The sulfuric acid which is required to produce the final Titanium product would have to be transported just under 400 km to the plant, resulting in much higher transportation costs. For these reasons, the Middleburg alternative was discarded.
 - **Alternative 2 (preferred alternative):** Richards Bay Richards Bay was the second furthest from Highveld Steel and Vanadium, however it was one of the closest to a port for bulk export of the final titanium product. In addition, a portion of land within Phase 1F of the RBIDZ, where key supporting infrastructure has already been established and services and utilities are available. Furthermore, the sulfuric acid, required for the production of titanium pigment would be sourced from nearby facilities like Foskor which is also located in Richards Bay. For the above reasons, the Richards Bay site was the most suitable site alternative, and thus this is where Phase 1, the Product Testing and Development Centre was developed. Due to the fact that Phase 1 is now already developed, there are no further site alternatives being pursued.
- **Technology Alternatives:** The alternatives considered were as follows:
 - Four beneficiation options of the discard furnace slag from Evraz Highveld were evaluated: smelting, physical upgrading, chlorination and sulfuric acid leaching process. The evaluation of the various typical titanium beneficiation processes revealed that smelting, physical upgrading, and chlorination processes are unsuitable due to the high levels of metal impurities (Calcium, Magnesium etc.) in the slag. As a result, the hydrometallurgical sulfuric acid leaching process route, commonly referred

to as the “sulfate” process, was selected as the technically viable processing route for the study. The study was largely based on patents developed for Highveld slag specifically, with enhancements and additions as derived from test work.

- In the technology selection phase various processing options were evaluated based on the possible processing routes, the proprietary information and confidentiality regarding certain processing routes, and accessibility to required reagents, technical know-how and operating skills requirements. Uncoated ¹anatase was initially identified as a relatively simple titanium pigment product to produce, possibly at the lower ranges of typical production costs. Conceptual process engineering and costing continued on this basis, up to and including financial analyses of two different processing routes. Following the outcomes of the titanium pigment market study conducted by TZ Minerals International Pty Ltd (TZMI), however, the decision was made to target coated rutile as product. This required the incorporation of a rutile nuclei production step as well as a pigment finishing unit operation. The decision to change from uncoated anatase to coated rutile as final product was prompted by the limited and diminishing market for uncoated anatase. These additional process areas were incorporated into the design, and added to the cost estimates and resultant financial analyses”
- Operational Options: With respect to the use of sulfuric acid in the plant, there were 2 options considered, viz buying the sulfuric acid from other suppliers and making own acid on site. A decision was made to rather manufacture the sulfuric acid on site to reduce risks related to transportation as well as to reduce costs.

The assessment will also include the “no-go” option.

Environmental Impact Assessment Process

Approach to the Environmental Impact Assessment

An EIA seeks to identify the environmental consequences of a proposed project from the beginning, and helps to ensure that the project, over its life cycle, will be environmentally acceptable, and integrated into the surrounding environment in a sustainable way. The project triggers activities listed in GNR325 (Listing Notice 2) of the NEMA and requires that a full EIA (scoping and impact assessment phases) be conducted.

Two parallel processes are followed during the scoping phase being the environmental technical process and stakeholder engagement process. This report is the draft Scoping Report and forms one of the first steps in the scoping process after which the EIA phase will be initiated. A summary of this process is shown in Figure ES-1.

¹ There are two crystalline modifications of titanium dioxide: rutile and anatase. Only the anatase variety finds its use as a color additive for foodstuffs.

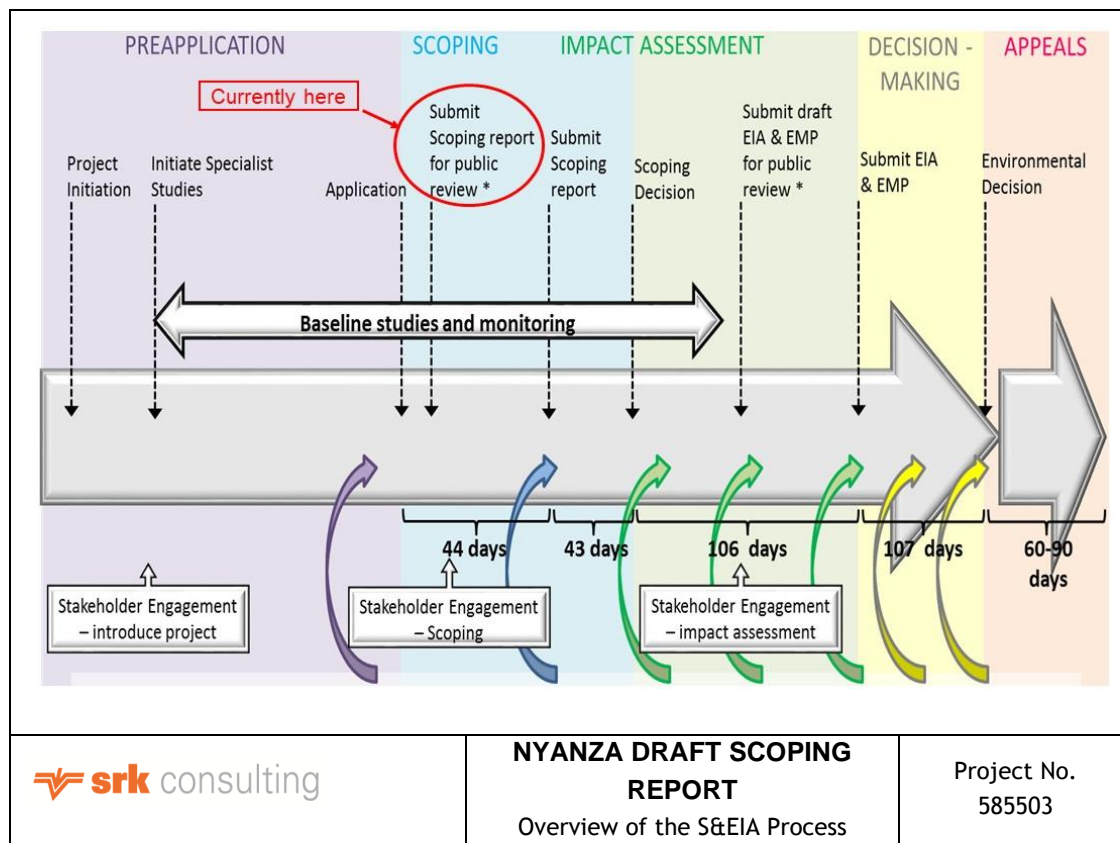


Figure ES - 1: Overview of the Environmental Impact Assessment Process

Stakeholder Engagement Process

The process commenced with pre-application consultation meetings that were held with the KZN EDTEA on 2 February 2022 and the DFFE on 21 February 2022 to discuss the proposed project, required authorisations and the EIA process to be followed.

Activities that have been undertaken for the public involvement process during the pre-application process are:

- Development of a stakeholder database: The stakeholder database comprises a variety of stakeholders identified from previous projects in the area, newly identified stakeholders through the initial registering process of this project.

The opportunity to participate in the EIA and to register as an Interested and Affected Party (I&AP) was announced in April 2022 through the following means:

- Letter of invitations to register were sent to I&APs on 20 April 2022;
- Media advertisements in English and IsiZulu were placed in the Zulu Observer on 22 April 2022;
- Site notices were erected at several places in and around the proposed study area on 7 April 2022;
- Collation of comments received into a Comments and Responses Register (CRR); and
- Obtaining and documenting registration and comment sheets.

The Draft Scoping Report will be made available for a 30-day commenting period from 13 July 2022 to 12 August 2022. All issues, comments and suggestions received from stakeholders will be reviewed and collated into a CRR. Where necessary, comments from stakeholders will also be incorporated into

the Final Scoping Report that will be submitted to the KZN EDTEA and DFFE for decision-making on the EA and WML applications respectively. Depending on the responses received during the registration period and should it be required, a public meeting and/or key stakeholder meeting may be held during the scoping phase of the project. The EAP will also make progress presentations to the Environmental Review Committee (ERC) on a quarterly basis. The ERC consists of the KZN EDTEA (environmental representatives- local office and Provincial); KZN Ezemvelo wildlife, RBIDZ (Chair), City of uMhlatuze representatives (Spatial planning as well as Environmental unit) and KZN Clean air association

Once the KZN EDTEA and DFFE have accepted the Final Scoping Report, the EAP will compile the EIR and EMPr, which will also be made available to the stakeholders for a 30-day review and comment period. Comments received will be incorporated into the Final EIAR and EMPr which will be submitted to the KZN EDTEA and DFFE for final decision making. The comments will also be collated into the CRR, which will form an Appendix to the EIR.

The stakeholders will be notified of KZN EDTEA and DFFE's Final decisions on the project once it has been communicated to the EAP and applicant (Nyanza).

Profile of the receiving Environment

The Draft Scoping Report provides a general description of the status quo of the receiving environment in the project area. It serves to set the scene and provide context to the area within which the scoping exercise was conducted. This section also includes the main issues/impacts associated with each aspect and how the proposed expansion will affect the biophysical and social environment. A summary of the main baseline aspects is included in Table ES-1, with more detail included in Section 10 of the report.

Table ES - 1: Summary of the Profile of the Receiving Environment

Aspect	Description
Climate	The Richards Bay area is located on a coastal plain. According to the Köppen-Geiger climate classification, the climate is considered to be ² Cfa (humid subtropical climate). Temperatures peak from December to February at approximately 35 °C with a minimum of 18 °C, dropping to daytime heights of approximately 28 °C and a minimum of 12 °C from June to August. The relative humidity is high, ranging from a high of 95% in the summer to a low of 28% in the winter. The wind most often blows from the South, South-East, and East, but shifts to North-East in the summer. Mean wind speeds range between 16 km/h and 24 km/h, only dropping below 10 km/h rarely. Mean annual rainfall was around 620 mm in 2017, 2018, and 2019 and the long-term average rainfall was approximately 1 200 mm, which was particularly low. Months with the highest rainfall are May, and November and December, although May, August, and October have the highest precipitation per hour. that rainfall is more-or-less evenly spread during different times of the day for most months but are slightly more during evening and night-time in October, November, and December.
Topography	The terrain is overall very flat with some gradual slopes towards the South at about 0.4% and some large pans. On the northern portion of the site, there is a sand dune

² The Köppen climate classification divides climates into five main climate groups, with each group being divided based on seasonal precipitation and temperature patterns. The five main groups are *A* (tropical), *B* (dry), *C* (temperate), *D* (continental), and *E* (polar). Each group and subgroup is represented by a letter. All climates are assigned a main group (the first letter). All climates except for those in the *E* group are assigned a seasonal precipitation subgroup (the second letter). For example, *Af* indicates a [tropical rainforest climate](#). The system assigns a temperature subgroup for all groups other than those in the *A* group, indicated by the third letter for climates in *B*, *C*, and *D*, and the second letter for climates in *E*. For example, *Cfb* indicates an [oceanic climate](#) with warm summers as indicated by the ending *b*. Climates are classified based on specific criteria unique to each climate type.^[8]

Aspect	Description
	<p>and a high lying area. The site is approximately 67 m above sea level in the North and about 42 m to 44 m above sea level in the South.</p> <p>The area's topography has three broad landforms. The coastal area is made up of Neogene marine and coastal aeolian sediments, to the inland, a broad, curving band running parallel to the coastal sediments include areas North of Empangeni, comprising of post-African surfaces (partly planed). The area South of Empangeni comprises of dissected landforms of various ages.</p>
Geology	<p>The site is situated on the Maputaland Coastal Belt (a generally flat landscape). This landscape comprises of quaternary sediments of marine origin that is about 18 000 years old. These sediments are yellowish in colour. Argillaceous redistributed sand of the Berea and Muzi Formations also forms part of the Maputaland Coastal Belt. The soils have very poor nutrition and is well leached, except in the interdune depressions where soils are rich in organics.</p>
Geotechnical	<p>According to the geological investigation that was undertaken for the RBIDZ Phase 1F, the site is underlain by medium dense soils, grading from approximately 1.0 m into silty to clean sands that is compressible, or sandy clays that is fully expanded with low shear strengths causing poor foundation conditions because of its lowered bearing capacity and increased settlement potential.</p>
Soils, land use, and land capability	<p>In terms of land use, the quaternary catchment has characteristics of intense land-use modifications in the past from agriculture, tourism, mining, recreational, residential, and industrial development activities.</p> <p>The project area borders mixed-use industrial developments, residential areas, and open areas. The broader area surrounding the site contributes significantly to stormwater drainage through the project area.</p>
Air Quality	<p>The larger area surrounding the project site includes many different commercial, and light and heavy industrial activities which includes two Aluminium smelters, a phosphoric acid fertilizer plant, kraft process paper mill, etc. The proximity of some important industries to residential areas are a cause for concern. The project area's current air quality is largely influenced by industrial activities located within the RBIDZ, as well as by farming activities, residential fuel burning, domestic fires, dust entrained by vehicles, and vehicle exhaust emissions. These sources of emissions vary from activities generating coarse airborne particulates (e.g., dust from roads when farmland is prepared) to fine particulate matter (e.g., vehicle exhausts).</p>
Noise	<p>Noise in the project area is currently mostly generated by vehicle traffic and other surrounding industries. During the construction phase, noise impacts may result due to the operation of machinery and equipment, along with noise from construction vehicles.</p> <p>Both the construction and operational phases of the project are expected to have a low cumulative noise impact in the area, and it is expected that, when the site is occupied, the noise will increase, depending on other industries located in the area. It is thus recommended that the EIA address noise levels.</p>
Visual	<p>The project development is not expected to negatively impact the aesthetical value as the site is surrounded by other industries and vacant land. During the project's construction phase, the storage of equipment and material might result in potential visual impact. The EMPr will provide mitigation measures for impacts related to construction.</p>

Aspect	Description
Surface Water	<p>According to the 2017 SANBI BGIS Strategic Water Source Areas (SWSAs) database, the project area is considered strategically important for economic and water security at a national level because it is located in both the Richards Bay ground water-fed estuary SWSA and the Zululand Coast surface water (Hatch, 2019).</p> <p>The project site falls within quaternary catchment area W12F, in the Pongola-Mtamvuna Water Management Area (WMA) (Figure 10-11). This WMA includes the following large rivers: Pongola, Mhlathuze, Mkuze, Thukela, Mvoti, and Umgeni amongst others. Main water resources in the uMhlathuze Catchment are the Nseleni and uMhlathuze rivers, Goedertrouw dam, and irrigation dams and impoundments, lakes, and pans (like the Nsezi, Mzingazi, Lake-Cubhu, and Nhlabane Lake), riparian areas, hillslope seepages, valley bottom wetland systems, and Mhlathuze River Floodplain and Estuary. The Qhubu, Mzingazi, and Nhlabane Lake, Mhlathuze Floodplain, Mhlathuze Estuary and associated valley bottom wetland, and Mountainous seeps in the Mhlathuze River's upper reaches are the most important wetland systems (KZN PPC, 2016). The catchment's water resources were awarded a PES rating of C (moderately modified) (DWS, 2019).</p> <p>There are no rivers or streams located on the affected property. There are three main stormwater drainage channels in Alton, of which two traverse the RBIDZ's 1F Estate. The proposed project site is located west of the central drainage line (Hatch, 2019).</p>
Geohydrology	<p>The hydrology is linked with the coastal plain's shallow water table and wetlands tend to be a representation of the soil surface/groundwater interface. Soils are described as partially saturated and unconsolidated. The primary unconfined aquifer has high clay and sand content in general, less than 30 m thick. The primary aquifer or estuary horizons comprise of fine-grained sand separated by consecutive layers that act as aquitards. Aquitards is impermeable, forming the barrier between the thin primary sand (or aquifers). A seasonal aquifer is suspended on the clayey horizons, particularly after high rainfall events. Flow would then be expected to follow the surface contours.</p> <p>The main aquifer overlays a deeper siltstone from Cretaceous marine deposits, representing the study area's lower boundary. Alluvial processes incised this formation under different marine environments with significant paleochannels which could impact the system's hydrodynamics significantly. Fracturing of the aquifer is expected below a few tens of metres that is less frequent and less open because of the increased pressure. An aquifer of slow groundwater velocities and low hydraulic conductivity is a result.</p> <p>Mean water depth is about 1.5 to 2.5 m below ground level and levels of groundwater generally follow the topography. The site's expected flow will be near horizontal but is also expected to flow in a north-westerly direction.</p> <p>High to medium permeable residuum, high recharge rates, and high groundwater potential aquifer that has a substantial aerial extent increase the significance of the aquifer along with a groundwater pollution risk.</p> <p>According to NFEPA, there are no areas with high groundwater recharge (recharge ratio of 300) in KZN. The project area has a groundwater recharge ratio of 165 in the East, 171 in the centre, and 170 in the West (Hatch, 2019).</p> <p>The classification map of aquifers in South Africa show that the area of study is identified as a minor aquifer system.</p> <p>The groundwater study undertaken by Engeolab; the groundwater quality is generally of good quality. With the exception of the Iron (Fe) and Manganese (Mn) concentrations, all analysed parameters were classified as ambient and</p>

Aspect	Description
	<p>representative of the natural, background water quality. The Fe and Mn concentrations in the majority of samples were very high and above drinking or ambient standards. This was attributed to the industrial processes in the area.</p> <p>There are no private boreholes in the area, however there are some industries that have extracted boreholes for either observation or groundwater monitoring (Engeolab, 2014). It was estimated that groundwater use in the area is low, approximately 0.55Mn³/annum) in comparison to the exploitation potential of 15Mn³/annum and the general authorisation limit of 400m³/ha/annum (Engeolab, 2014).</p> <p>No existing production boreholes or extraction boreholes were found on the proposed RBIDZ 1F site. Only one monitoring borehole was found on the south-western corner of the site (it is believed that this belongs to the neighbouring property) (Engeolab, 2014).</p>
Wetlands	<p>A wetland assessment undertaken as part of the RBIDZ EIA found that there are three (3) wetland units that will be affected by the proposed Nyanza 80 000 tpa TiO₂ Pigment Plant. According to the study, the following recommendations were made in respect to the development of the wetlands in RBIDZ Phase 1F:</p> <ul style="list-style-type: none"> • Development of, as well as interference with, the functional and healthy wetland of Area A should be avoided in its entirety; • Development of Area B is deemed generally unacceptable, due to the level of ecosystem functions it provides. However, development / in-filling of a portion of the wetland may be approved by the competent authority should a compelling and/or persuasive motivation be provided in relation to the socio-economic implications of the proposed development and should effective mitigation measures be proposed and approved; and • Two options were considered for the potential development of Area C, the preferred developable wetland area, namely the development in the upper northern portion of the system only; or the development of the entire unit. The EA issued to the RBIDZ (Ref 14/12/16/3/3/2/665) authorised the development of the entire unit. <p>A site-specific wetlands and aquatic biodiversity assessment will be undertaken as part of the current EIA process. The specialist study will include the verification of the delineated wetlands, assessment of the potential impacts and compilation of a wetland management plan that will be incorporated into the EMP of the project.</p>
Areas of conservation concern	<p>The site for the 80 000 tpa 80 000 tpa TiO₂ Pigment Plant of Nyanza is not situated within a Marine Protected Environment or South African Protected Area, but is, however, located in a Critical Biodiversity Area (areas that are required to meet biodiversity targets for species, ecosystems or ecological processes).</p>
Biodiversity	<p>The desktop analysis of the terrestrial biodiversity found that the Nyanza project location is situated on Maputaland Wooded Grassland extending across a large portion of the study area. The extent of the threatened ecosystem that remains on the study area, namely Kwambonambi Hygrophilous Grasslands, are still extensive. Furthermore, the study area is within 4 km of the Enseleni Nature Reserve and within 8 km of the Richards Bay Game Reserve which is classified as national protected and conservation areas. The Richard's Bay Game Reserve is also classified as an important birds and biodiversity area. The study area contains a large portion that is of critical biodiversity importance (Area 3: Optimal). In relation to water sources the</p>

Aspect	Description
	<p>area is located within the Zululand Coast and is considered to be within a strategic Water Source Area.</p> <p>The field assessment found that the vegetation type is the Maputaland Wood Grassland (endangered). The study area consists of freshwater wetlands, KwaZulu-Natal Coastal Forests, and Maputaland Wooded Grassland.</p> <p>Five broad habitat units were identified as (1) Degraded Hygrophilous Grassland, (2) Degraded Coastal Forest, (3) Thicket Habitat, (4) Freshwater Habitat, and (5) Transformed Habitat ranging in protection importance.</p> <p>Permits to remove the species <i>Boophone disticha</i>, <i>Crinum macowanii</i>, <i>Eulophia speciosa</i>, and <i>Hypoxis hemerocallidea</i> were obtained by the RBIDZ during Phase 1F from the Ezemvelo KZN Wildlife Permits Office (OP 836/2022). Permitted species were relocated as stipulated in the permit to where no future infrastructure is planned for the study area.</p> <p>Degraded Hygrophilous Grassland has moderately low floral sensitivity and intermediate faunal sensitivity. Degraded Coastal Forest has moderately high floral sensitivity and moderately high faunal sensitivity. The Thicket Habitat has moderately low floral sensitivity and intermediate faunal sensitivity. Freshwater Habitat Depression Wetlands have moderately high floral sensitivity and moderately high faunal sensitivity. Degraded Hygrophilous Grassland has moderately low floral sensitivity and intermediate faunal sensitivity. Freshwater Habitat: Wetland Flats and Earth Canal has intermediate floral sensitivity and intermediate faunal sensitivity. The Transformed Habitat has low floral sensitivity and low faunal sensitivity.</p>
Socio-Economy	<p>The City of uMhlathuze Local Municipality is the third most important area in KZN in terms of primary manufacturing of economic production. The City of uMhlathuze Local Municipality houses some of the world's industrial giants. The concentration of industries is supported by activities and output of important development nodes. Most of the commercial and industrial activities are located in Richards Bay, Empangeni, and Felixton.</p> <p>The area is the third most important in KZN in terms of economic production which contributes 5.5% of total formal employment and 7.6% of the total gross geographic product. Port facility development has promoted and initiated the development of manufacturing activities through the years. The RBIDZ and nearby port are import assets that can exploit opportunities to export to the world's vast markets. Policies were created to encourage investment and promote industrial growth, prioritising projects on the basis of job creation contributions.</p> <p>Interventions and strategies revolve around primary industrial development promotion, while creating entry into the market for Small, Medium and Micro Enterprises (SMMEs), the informal sector, and emerging businesses.</p> <p>The local economy is imperative to national and international economies. A large number of importing and exporting industries like Aluminium smelters, Richards Bay Minerals, Mondi Kraft, Exxaro KwaZulu-Natal Sands, Bell Equipment, Foskor, Richards Bay Coal Terminal, the port of Richards Bay, and cane and timber agricultural activity means that the region's welfare is influenced by national and international market movements. 95% of economic activities are located in Felixton, Empangeni, and Richards Bay.</p> <p>The City of uMhlathuze Local Municipality consists of a population of approximately 410 465 people with 103 915 households. The highest levels of employment are among the employable youth (16 – 35 years). Unemployment levels are at 75.4%. This implies that the City of uMhlathuze Local Municipality has a high economic</p>

Aspect	Description
	growth potential and should endeavour to speed up the provision and development of skill through initiatives. The current dependency ratio is 48.2, indicating high dependency from the youth on those that are economically active. The key issues are thus high unemployment rates, a lack of skills, and slow economic growth.
Heritage and Cultural Aspects	<p>A cultural heritage survey was done in 2015 as part of the EIA for RBIDZ Phase 1F (NEMAI Consulting, 2016). This survey concluded that there are no heritage sites present at the RBIDZ. The surrounding area, however, relatively rich in archaeological sites and material may be exposed during construction. Attention is drawn to the South African Heritage Resources Act, 25 of 1999 and the KwaZulu-Natal Heritage Act, 4 of 2008, requiring operations that expose historical or archaeological remains to cease immediately, pending a provincial heritage agency evaluation.</p> <p>A site-specific phase 1 HIA will be undertaken as part of the Nyanza EIA process.</p>

Anticipated Impacts

The scoping phase aims to identify the potential positive and negative biophysical, socio-economic and cultural impacts that the proposed project. Anticipated impacts that have been identified by the project team are summarised in Table ES-2.

All impacts in terms of construction, operation, and decommissioning together with the recommended mitigation measures will be and addressed in the impact assessment phase of the project.

Table ES - 2: Anticipated Impacts

Element of Environment	Potential Impact Descriptions
Socio-Economic	Possible job and business opportunities during all phases of the project.
Hydrogeology	Possible groundwater contamination from hydrocarbons leaking from construction vehicles, chemicals and materials handled on site.
Surface water	Possible surface water contamination from hydrocarbons leaking from construction vehicles, chemicals and materials handled on site.
Air Quality	Possible impact on air quality in the area.
Noise	Possible generation of noise during the construction, operation, and decommissioning of the 80 000 tpa TiO ₂ Pigment Plant.
Heritage Resources	Possible impact on heritage resources.
Visual	Possible visual impacts due to the construction and operation of the plant
Soils/Land Use/Land Capability	Localised loss of soil resource and change in land capability and land use due to the clearance of vegetation is expected.
Traffic	Possible impacts on traffic due to transportation of construction material
Biodiversity	Loss of biodiversity due to vegetation clearance for construction.
Aquatic Biodiversity Impact Assessment	Possible impacts on the wetlands on the project site.
Traffic	Possible impact on traffic during all phases of the project

Preliminary high level mitigation measures have been identified and summarised in Section 12. Specific mitigation measures will be identified during the impact assessment phase of the process. The potential impacts identified will be assessed during the impact assessment phase of the process. Specialist studies will be undertaken, and the specialists will identify the required mitigation measures that Nyanza must implement to reduce the significance of the identified impacts.

Specialist Studies

The DFFE environmental screening tool was used to identify the required specialist studies. The preliminary assessment of the DFFE environmental screening report for the proposed project (very high, high, and medium sensitivity) shows that wetland and aquatic assessment as well as terrestrial biodiversity specialist studies will be required. However, due to the requirements of other relevant legislation and project requirements, additional specialist studies including Heritage Assessment, Air Quality Impact Assessment; Noise Impact Assessment; Geohydrology Assessment; Hydrogeology; Traffic Impact Assessment, and Hydrology and Stormwater Management Plan will also be conducted during the impact assessment phase of the process. In addition, the EAP team will also include a visual and socio-economic impact assessment of the proposed project.

The generic terms of reference (ToR) for each specialist study is to:

- Describe the existing baseline characteristics of the study area and place this in a regional context;
- Identify and assess potential impacts resulting from the project (including impacts associated with the construction and operation of the project), using SRK's prescribed impact rating methodology;
- Identify and describe potential cumulative impacts resulting from the proposed development in relation to proposed and existing developments in the surrounding area;
- Recommend mitigation measures to avoid or minimise impacts and/or optimise benefits associated with the proposed project; and
- Recommend and draft a monitoring programme, if applicable.

Quantification of Impacts

The anticipated impacts associated with the proposed project will be assessed according to SRK's standardised impact assessment methodology which is presented Section 11.9. This methodology has been utilised for the assessment of environmental impacts where the consequence (severity of impact, spatial scope of impact and duration of impact) and likelihood (frequency of activity and frequency of impact) have been considered in parallel to provide an impact rating and hence an interpretation in terms of the level of environmental management required for each impact.

Plan of Study for the EIA

The Draft Scoping Report is concluded with a Plan of Study (PoS) for the EIA which explains how the EIA will be conducted for the project in accordance with the following:

- Key environmental issues identified during the scoping phase to be investigated further in the EIA phase;
- Feasible alternatives to be assessed further in the EIA phase;
- Development of an EMPr;
- Specialist investigations which need to be finalised;
- The public participation process to be followed;
- Contents of the EIA/EMPr Report; and
- Consultation with the authorities.

Conclusion and Recommendation

The aim of this Scoping Report is to provide an indication of the identified, positive, and negative environmental and socio-economic impacts associated with the proposed project activities. The proposed project will be located within Phase 1F of the RBIDZ. This site is zoned as General Industrial (IDZ Industry) and is in line with proposed project's description. It is expected that the project will lead to the creation of about 1 200 jobs during its construction phase and 550 job during its operational phase. Approximately 680 of these jobs will be for skilled labourers, while the remaining 1 070 will be for unskilled labourers. People from the Richards Bay area will be preferably employed as this will be the most economically viable option. Should the project not proceed, a large negative socio-economic loss will be a consequence for the region.

The stakeholder engagement in the Scoping Phase will play an important role in determining possible impacts and allowing the concerns by the public to be adequately addressed in the Impact Assessment Phase of the EIA process.

The Scoping Report has presented:

- The environmental process undertaken so far;
- A brief description of the proposed project;
- A baseline description of the current environment;
- The potential environmental and social impacts identified to date; and
- The recommended environmental process to be followed to develop the EIA/EMPr Report.

Once the Scoping Report has been accepted by the KZN EDTEA and DFFE, an EIR, including a Draft EMPr, will be compiled and subjected to a round of public comment. The EIR will then be submitted to the authorities for decision-making. On submission of the EIR and EMPr to the KZN EDTEA and DFFE, notification will be sent to registered I&APs to inform them of the submission of the documents; and the opportunity to request copies of the Final reports.

Anticipated environmental, social and cultural impacts have been identified and described in Section 12. Extensive consideration has been given to the proposed location and design of the project and no fatal flaws have been identified during scoping phase. The DFFE environmental screening tool was used to identify the required specialist studies. The preliminary assessment of the DFFE environmental screening report for the proposed project (very high, high and medium sensitivity) shows that wetland and aquatic assessment as well as terrestrial biodiversity specialist studies will be required. However, due to the requirements of other relevant legislation and project requirements, additional specialist studies including Heritage Assessment, Air Quality Impact Assessment; Noise Impact Assessment; Geohydrology Assessment; Hydrogeology; Traffic Impact Assessment and Hydrology and Stormwater Management Plan will also be conducted during the impact assessment phase of the process. In addition, the EAP team will also include a visual and socio-economic impact assessment of the proposed project.

Findings from specialist studies will be incorporated into the EIR and EMPr during the EIA phase. The proposed comprehensive stakeholder engagement process in the PoS will ensure that the stakeholders are involved in the process, from the conception of the EA application process to the end. It is anticipated that implementation of the PoS presented in this report will result in an adequate EIA process which will result in the formulation of a sound EMPr to be integrated into the overall management system of the 80 000 tpa TiO₂ Pigment Plant.

YOUR COMMENT ON THE DRAFT SCOPING REPORT

This Draft Scoping Report will be available for comment for a period of 30 days from 13 July 2022 to 12 August 2022. Copies of the Scoping Report have been made available at the following public places for review:

Public Place	Locality	Telephone
Richards Bay Public Library	Richards Bay Central, Richards Bay, 3900	035 907 5840
SRK Website	www.srk.co.za	(012) 361 9821

An electronic copy will also be available on CD on request from the stakeholder engagement officers. I&APs are requested to provide comments and information on the following aspects of the proposed project:

1. Information on how I&AP's consider that the proposed activities will impact on them or their socio-economic conditions;
2. Written responses stating their suggestions to mitigate the anticipated impacts of each activity;
3. Information on current land uses and their location within the area under consideration;
4. Information on the location of environmental features on site to make proposals as to how and to what standard the impacts on site can be remedied; and
5. How to mitigate the potential impacts on their socio-economic conditions and to make proposals as to how the potential impacts on their infrastructure can be managed avoided or remedied.

DUE DATE FOR COMMENT

12 August 2022

Please submit comments to the stakeholder engagement officers:

Vusi Masango / Anthoneth Matlala
 SRK Consulting
 P O Box 35290, Menlo Park, 0102
 Phone: (012) 361 9821
 Fax: (086) 231 3497
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Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK Consulting (South Africa) (Pty) Ltd (SRK) by Nyanza Light Metals Pty (Ltd) (Nyanza). The opinions in this Report are provided in response to a specific request from Nyanza to do so. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features, as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

List of Abbreviations

AEL	Air Emission Licence
BEE	Black Economic Empowerment
CARA	Conservation of Agricultural Resources Act
CaO	Quick Lime or Calcium Oxide
CaOH ₂	Calcium Hydroxide
CBA	Critical Biodiversity Area
CO ₂	Carbon Dioxide
CO	Carbon Monoxide
COS	Carbonyl sulphide
Cr ⁶⁺	Chromium 6 valent
Cr ³⁺	Chromium 3 valent
CD	Calciner discharge
CRR	Comments and Responses Report
DAFF	Department of Agriculture, Forestry and Fisheries
DALRRD	Department of Agriculture, Land Reform and Rural Development
DFFE	Department of Forestry, Fisheries and the Environment
DGS	Digester off-gas scrubbing
DHSWS	Department of Human Settlements, Water and Sanitation
DWS	Department of Water and Sanitation
GDP	Gross Domestic Product
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIR	Environmental Impact Report
EKZNW	Ezemvelo KwaZulu-Natal Wildlife
EMF	Environmental Management Framework
EMPr	Environmental Management Programme
ERC	Environmental Review Committee

FBC	
Fe	Iron
Fe ³⁺	Iron valence 3
GNR	General Notice Number
HCl	hydro chloric acid (), carbonyl sulphide (COS)
HDPE	High-density polyethylene
HIA	Heritage Impact Assessment
HSS	Highveld Steel Slag
H ₂ S	Hydrogen Sulfide
H ₂ SO ₄	Sulfuric Acid
I&APs	Interested and Affected Parties
ICT	Information and Communications Technology
IDP	Integrated Development Plan
IDZ	Industrial Development Zone
IWWMP	Integrated Water and Water Management Plant
KZN	KwaZulu-Natal
KZN EDTEA	KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs
KZNNCMA	KwaZulu Natal Nature Conservation Management Act, 1997 (Act 9 of 1997)
MEC	Member Executive Council
mPVC	Microcellular Polyvinyl Chloride
MSDS	Material and Safety Data Sheet
N ₂	Nitrogen gas
NaOH	Sodium Hydroxide
NEMA	National Environmental Management Act
NEM:AQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act 2004 (Act No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act 2008 (Act No. 59 of 2008)
NFA	National Forestry Act, 1998 (Act No. 84 of 1998)
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act, 1999(Act No 25 of 1999)

NWA	National Water Act, 1998 (Act No. 36 of 1998)
PAIA	Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)
PDTC	
PFR	Parallel Flow Regenerative
RBIDZ	Richards Bay Industrial Development Zone
RBM	Richards Bay Minerals
S&EIA	Scoping and Environmental Impact Assessment
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SMME	Small, Medium and Micro Enterprise
SO ₂	Sulfur Dioxide
SO ₃	Sulfur Tri Oxide
SWMP	Stormwater Management Plan
SWSA	Strategic WSA
SWSA-sw	SWSA for surface water
Ti ³⁺	Titanium valence3
TiO ₂	Titanium Dioxide
TiCl ₄	Titanium Tetra Chloride
TiOCl ₂	Titanium Oxychloride
TSC	Technical Services Centre
ToR	Terms of Reference
TZMI	TZ Minerals International Pty Ltd
uPVC	Unplasticised Polyvinyl Chloride
WAC	Waste Acid Concentration
WMA	Water Management Area
WML	Waste Management License
WSAs	Water Source Areas

WUL	Water Use License
WULA	Water Use License Application

1 Introduction and Background

Nyanza Light Metals (Pty) Ltd (Nyanza) is proposing to construct and operate a plant that will produce 80 000 tonnes per annum (tpa) of Titanium Dioxide (TiO₂) pigment. The project will be located within Zone 1F of the Richard's Bay Industrial Development Zone (RBIDZ) in Alton, Richards Bay (Figure 1-1).

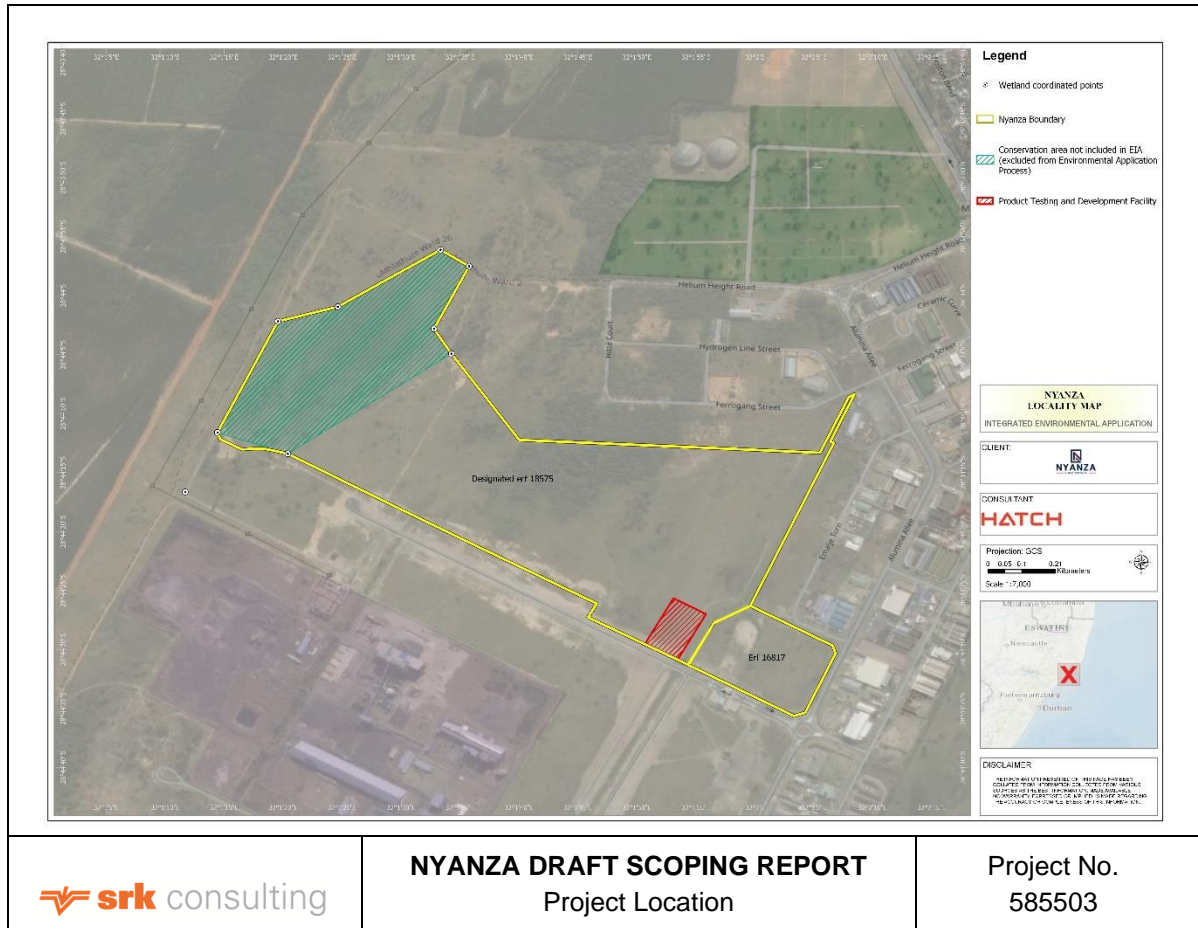


Figure 1-1: Project Location

Feedstock will be ilmenite (design is based on typical Tellnes ilmenite) and/or conventional sulfate (Richards Bay Minerals (RBM)) slag and a waste slag from the erstwhile Highveld Steel plant – referred to as Highveld Steel Slag (HSS). Design provision is made for a blend of any proportion of these feedstocks (TCSG, 2022). The expected life of the proposed plant is 60 years.

The total area of the Nyanza site is about 69 ha and includes sections:

- 15825 – a wetland area and not to be developed
- 16786 – largely wetland off-set area not to be developed
- 16787
- 16788
- 16789 – which has a stormwater servitude of 30m on the eastern side; and
- 16817 – east of the stormwater servitude and is to be developed as a ‘green industry’ area.

The proposed project triggers activities listed in terms of Listing Notices 1 (Activity 25) and Listing Notice 2 (Activities 1, 4 and 6) and Listing Notice 3 (Activities 2 and 14) of the National Environmental

Management Act, 1998 (Act 107 of 1998) (NEMA) (as amended) and will require an Environmental Authorisation (EA) from the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA). In addition, the proposed project triggers activities listed in Government Notice Regulation (GNR) 921 of the National Environmental Management: Waste Act, 2008 (Act 58 of 2008) (Category B Activities 3, 4 and 10 and Category C Activity2) and will require a Waste Management Licence (WML) from the Department of Forestry, Fisheries, and the Environment (DFFE). Since the project triggers activities in Listing Notice 2 of the NEMA and category B of the NEM: WA, a full Environmental Impact Assessment (EIA) including Scoping and Impact Assessment will be followed as stipulated in Government Notice Regulation (GNR) 326 of the NEMA, as amended.

SRK Consulting (SA) (Pty) Ltd (SRK) has been appointed by Nyanza as the independent Environmental Assessment Practitioner (EAP) to conduct the EA, WML and AEL application processes for the project. The reports and documentation for the EA and WML application processes will be compiled and finalised for submission to the EDTEA and DFFE for consideration and decision making. Where required, the EDTEA and DFFE will consult with other government authorities as required in terms of Section 24(K) of the NEMA.

Nyanza will also apply for an Air Emissions Licence (AEL) which will be submitted to the King Cetshwayo District Municipality and a Water Use Licence (WUL) which will be submitted to Department of Water and Sanitation (DWS).

2 Purpose and context of this document

2.1 Objectives of this Report

This document serves as the draft Scoping Report for the first phase of the overall EIA process and includes the following objectives:

- Providing an overview of the legal requirements with regard to the proposed project, the proposed project description and anticipated environmental and social issues and impacts that will be further investigated in the EIA;
- To identify and engage with Interested and Affected Parties (I&APs) and allow for adequate participation in the process;
- To assess the receiving environment in terms of current state and determine potential positive or negative impacts which may result due to the proposed development;
- To consider alternatives for achieving the project's objectives;
- To identify significant issues to be investigated further during the execution of the EIA phase; and
- Setting out the scope of the EIA process (Plan of Study) and the Terms of Reference (ToR) for specialist studies and outlining the approach and methodologies to be used in the EIA process, e.g., the proposed impact rating methodology.

This report will be submitted to the KwaZulu-Natal (KZN) EDTEA and DFFE for review and decision making.

2.2 Environmental Authorisation and Waste Management Licence Application Process

The first phase of the EA and WML application processes is the scoping phase, which will inform the impact assessment phase. This phase provides Interested and Affected Parties (I&APs) an opportunity to provide the EAP with issues and concerns with respect to the proposed project in order to inform the technical studies so that they can evaluate these concerns during the impact assessment phase of the project.

This Draft Scoping Report provides a description of the proposed project and sets out the proposed scope of the EIA and EMPr that will be undertaken for the proposed 80 000 tpa TiO₂ Pigment Plant in Richards Bay. This includes alternatives that will be evaluated for various aspects of the project, the anticipated potential environmental impacts, issues raised by stakeholders, the specialist studies that will be undertaken including the terms of reference of the specialist studies, and the qualifications and experience of the study team.

Stakeholder engagement is a key element of the environmental decision-making process, and stakeholder engagement forms part of the scoping phase as well as the impact assessment phase.

The Draft Scoping Report will be made available for public review prior to submission to the KZN EDTEA and DFFE for decision making. All the comments received will be captured and addressed where feasible in the Scoping Report as well as the Environmental Impact Assessment Report (EIR).

Figure 2-1 provides an illustration of the EIA process that will be followed.

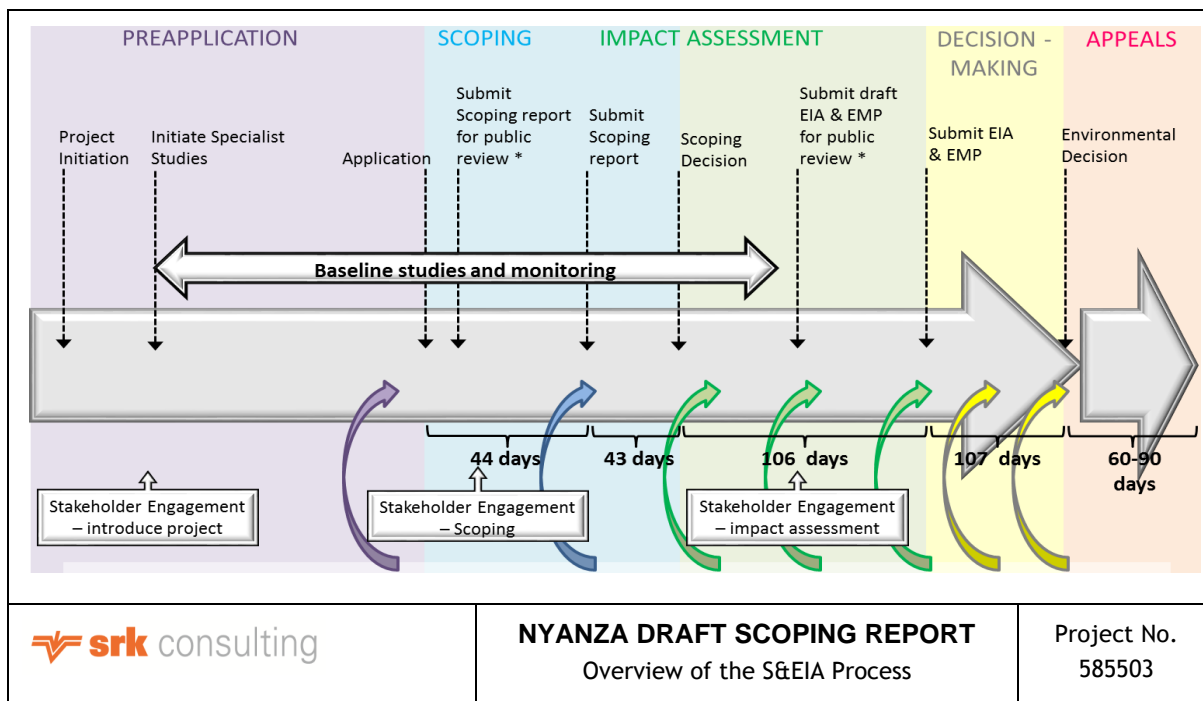


Figure 2-1: Overview the Environmental Impact Assessment Process

2.3 Report Index in Relation to the NEMA Regulations

Regulation 2, Appendix 2 of GNR 982, as amended in 2017 and 2021 published in terms of NEMA stipulates the minimal requirements and issues that need to be addressed in the Scoping Report. This report strives to address all these requirements as per regulations. Table 2-1 provides the regulations that have been addressed and the section of the Scoping Report where these requirements can be found.

Table 2-1: Requirements of Regulation 2 of GNR 326

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Scoping Reports	Section
Appendix 2 (a)	Details of – (i) The EAP who prepared the report; and (ii) The expertise of the EAP, including a curriculum vitae	Section 3.1.2
Appendix 2 (b)	The location of the activity, including – (i) The 21-digit Surveyor General code of each cadastral land parcel; (ii) Where available, the physical address and farm name; (iii) Where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	Section 4
Appendix 2 (c)	A plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is – (i) A linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) On land where the property has not been defined, the coordinates within which the activity is to be undertaken; or.	Figure 4-1 Figure 5-1 and Appendix C

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Scoping Reports	Section
Appendix 2 (d)	A description of the scope of the proposed activity, including – (i) All listed and specified activities triggered; (ii) A description of the activities to be undertaken, including associated structures and infrastructure.	Section 5 Table 7-1
Appendix 2 (e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.	Section 7
Appendix 2 (f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location.	Section 9
Appendix 2 (g)	A full description of the process followed to reach the proposed preferred activity, site, and location of the development footprint within the site, including-	
		Section 6
		Section 8
		Section 8.5
		Section 10
		Section 12
		Section 11.9
		Section 12
		Section 12
		Section 12
		Not Applicable
Section 15		

Section of the EIA Regulations, 2014	Description of EIA Regulations Requirements for Scoping Reports	Section
Appendix 2 (h)	<p>A plan of study for undertaking the environmental impact assessment process to be undertaken including-</p> <ul style="list-style-type: none"> (i) A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity; (ii) A description of the aspects to be assessed as part of the environmental impact assessment process; (iii) Aspects to be assessed by specialists; (iv) A description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists; (v) A description of the proposed method of assessing duration and significance; (vi) An indication of the stages at which the competent authority will be consulted; (vii) Particulars of the public participation process that will be conducted during the environmental impact assessment process; (viii) A description of the tasks that will be undertaken as part of the environmental impact assessment process; (ix) Identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored. 	Section 10.16
Appendix 2 (i)	<p>An undertaking under oath or affirmation by the EAP in relation to-</p> <ul style="list-style-type: none"> (i) The correctness of the information provided in the report; (ii) The inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) Any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties. 	Section 13
Appendix 2 (j)	<p>An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.</p>	Section 13
Appendix 2 (k)	<p>Where applicable, any specific information required by the competent authority.</p>	Not Applicable
Appendix 2 (m)	<p>Any other matter required in terms of Section 24(4)(a) and (b) of the Act.</p>	Partially addressed in the Draft Scoping Report, the remainder will be addressed in the EIA and EMPr.

3 Contact Person and Correspondence

SRK Consulting (South Africa) (Pty) Ltd (SRK) has been appointed by Nyanza as the independent Environmental Assessment Practitioner (EAP) to undertake the necessary environmental authorisation process and associated stakeholder engagement process to meet the requirements of the NEMA.

3.1.1 Applicant

Table 3-1 provides the details of the applicant and facility owner's representative.

Table 3-1: Applicant contact details

Contact details of the Applicant:
Nyanza Light Metals (Pty) Ltd
Physical Address: 5 th floor, Hogan Lovells Building, 140 West Street, Sandton, 2057
Postal Address: PostNet, Suite 510/Private Bag X1, Melrose Arch, Melrose North, 2076
Contact Person: Nolwazi Tetyana
Tel: 011 684 1286 or 082 304 2772
E mail: Nolwazi.Tetyana@nyanzametals.com

3.1.2 Environmental Assessment Practitioner

SRK was established in 1974 and has since undertaken a large variety of environmental studies. SRK is a South African founded international organisation of professionals providing a comprehensive range of consulting services to natural resource industries and organisations. South African offices are staffed with over 400 professional consultants in nine offices, operating in a range of disciplines, mainly related to the environment, water, social, and mining sectors. Back-up and peripheral expertise are available within these offices for all environmental projects.

SRK has been appointed by Nyanza as the EAP. The EAPs involved in the compilation of this S&EIA and their contact details are provided in Table 3-2.

Table 3-2: EAP Contact Details

EAP Name	Contact Number	Email Address
Manda Hinsch	012 361 9821	mhinsch@srk.co.za
Ndomupe Masawi	012 361 9821	nmasawi@srk.co.za
Vusi Masango	012 361 9821	vmasango@srk.co.za
Anthoneth Matlala	012 361 9821	amatlala@srk.co.za
Marissa Swart	012 361 9821	mswart@srk.co.za
Siphelele Mkhize	031 279 1200	smkhize@srk.co.za

Manda Hinsch is a Partner within SRK and is registered Professional Natural Scientist (SACNASP Reg Number 400164/09) and she has a Hons, degree in Water Utilisation and more than 35 years' experience in the water and waste fields, both nationally and internationally. She has been working for more than 15 years a regulator for the Department of Water and Sanitation in developing water quality management policy and overseeing the implementation there of. The recent 15 years has Manda

been a consultant in the wider environmental field for SRK. Being on both side of the water industry has given her a very balanced overview of what is required to comply with legislation but simultaneously be very pragmatic in applying the legislation. She is therefore well placed to be the Project Manager on this project.

Ndomupe Masawi is a registered Professional Natural Scientist (SACNASP Reg Number 400045/14) with an MSc Degree in Geo-Information for Environmental Management and an MSc Degree in Integrated Water Resource Management (IWRM). She has more than 15 years of Integrated Environmental Management and project management experience. Her experience includes compiling Environmental Management Programmes, undertaking Public Participation Processes, providing GIS Services and undertaking the processes and assessments to support applications for Environmental Authorisations, WULs, Waste Management Licences and Air Emission Licences, for steel galvanizing, roads, railway lines, power stations, airports, dams, housing developments, schools in South Africa, Tanzania, Botswana, Lesotho, Zimbabwe, and Uganda.

Vusi Masango has been involved in the field of Disaster Management and Environmental Impact Assessments (EIAs) for the past 7 years. He has been involved in various Environmental Impact Assessments and Disaster risk assessment & asset management projects, currently employed by SRK Consulting as a Junior Scientist in the Pretoria office in the Environmental Department. Vusi has completed a National Diploma in Agricultural Science at Tshwane University of Technology in 2012 and is busy with his Bachelor of Arts in Environmental Management in Unisa. Vusi also attended the following courses (Report Writing, Microsoft word level 1 and Microsoft Excel level).

Anthoneth Matlala is an Environmental Scientist, with a BSc. Degree in Life and Environmental Science. She is registered as a Candidate Natural Scientist (SACNASP Reg Number 121047) and a Candidate EAP (EAPASA Reg Number 2020/1161). She has over 3 years of experience in integrated environmental management and project management. Her experience includes compiling environmental management programmes, undertaking public participation processes, providing basic geographic information system (GIS) services, undertaking Environmental Compliance Audits, and undertaking the processes and assessments to support applications for environmental authorisations, water use licences, waste management licences and air emission licences, for hospital incinerators, roads, power lines, power stations, dams, housing developments, and schools through several provinces of South Africa.

Marissa Swart holds an Honours degree in Geography and Environmental Science and is busy completing her master's degree in Environmental Management. Ms Swart is a newly appointed Junior Environmental Scientist at SRK Consulting (South Africa) (Pty) Ltd and is eager to gain experience in the Environmental Management field.

Siphelele Mkhize has five years' experience in the environmental consulting industry. His early career primarily focused on the remediation of contaminated land and groundwater which involves scientific site investigations, environmental legal compliance, stakeholder, as well as local and national authorities' engagement. He has shown aptitude and a sound understanding of the environmental authorization industry, having taken up the role of Environmental Assessment Practitioner (EAP) and Lead Auditor in numerous industrial developments and housing projects. In addition to his problem-solving skills, Siphelele has a proven record of offering technical solutions that are cost-effective and environmentally sustainable. Siphelele Mkhize has been involved in a number of stakeholder engagement processes in KZN, including Richard's Bay 2016.

The Curriculum Vitae and declaration of interest of the EAP team and the background on experience gained by SRK in the field of Environmental Impact Assessments is provided in Appendix A and Appendix B respectively.

3.1.3 Competent Authority Details

The details of the competent authorities are provided in Table 3-3.

Table 3-3: Competent Authority details

Department	Contact Person	Contact Details	
KZN EDTEA	Ms Zama Mbanjwa	Tel	033 264 2898 or 0812719541
		Email	Zama.Mbanjwa@kznedtea.gov.za
	Ms Fikelephi Mthembu	Tel	033 264 2616 or 082 796 3470
		Email	Fikelephi.Mthembu@kznedtea.gov.za
DFFE	Mr Lukas Mahlangu	Tel	012 399 9791
		Email	lmahlangu@environment.gov.za

3.1.4 Local Authority Details

The project area is located in the RBIDZ in Alton, Richards Bay in the City of uMhlathuze Local Municipality within the King Cetshwayo District Municipality, KwaZulu-Natal Province.

Details of the relevant municipality are provided in Table 3-4.

Table 3-4: Local and District Municipality details

Department	Contact Person	Contact Details	
King Cetshwayo District Municipality	Ntombezinhle Buthelezi	Tel	035 787 2682
		Email	buthlezint@kingcetshwayo.gov.za
City of uMhlathuze Local Municipality	Sharin Govender	Tel	035 907 5174
		Email	Sharin.Govender@richemp.org.za
King Cetshwayo District Municipality and City of uMhlathuze Local Municipality	Zipho Zondo	Tel	035 907 5174
		Email	Zondozn@mhlathuze.gov.za

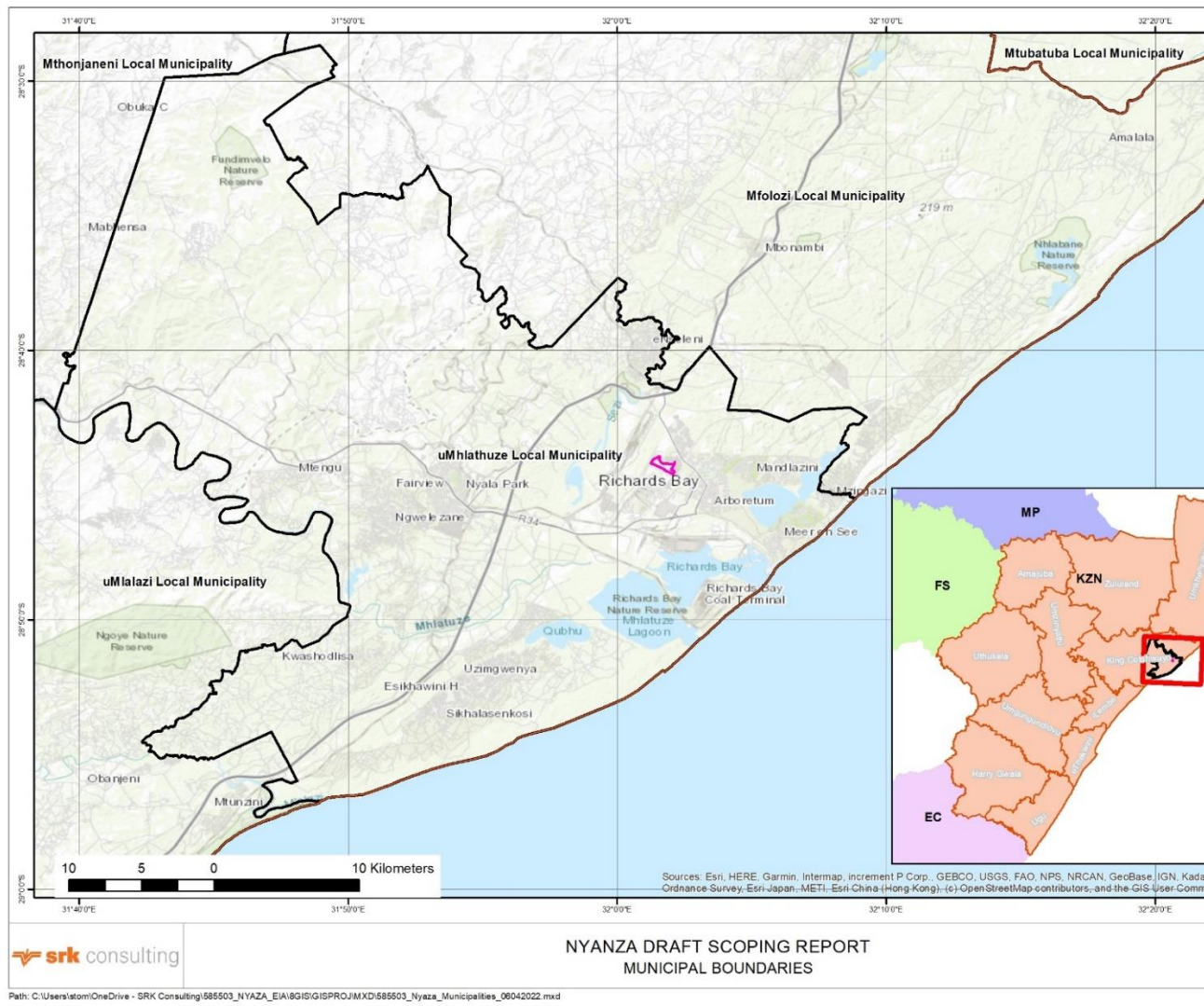


Figure 3-1 provides an illustration of the relevant district and local municipalities surrounding the proposed project.

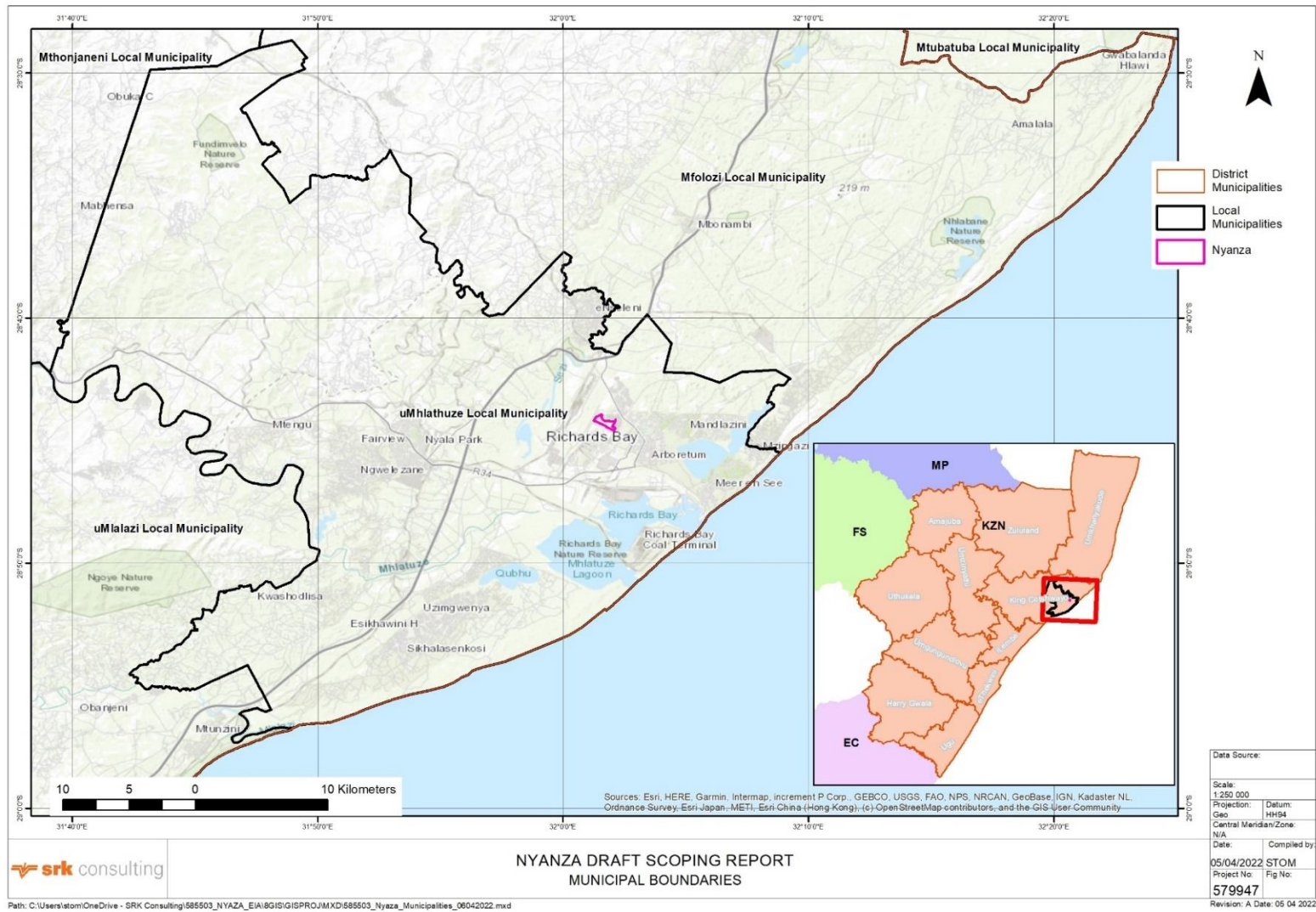


Figure 3-1: Relevant District and Local Municipality

4 Project Location

The proposed project is located on the erf numbers as illustrated in Figure 4-1 and Table 4-1 provides a description of the affected properties.

Table 4-1: List of affected properties and property portions

Physical Address	Owner	Property / Erf No.
RBIDZ Phase 1F 125 Alumina Allee Alton Richards Bay 3900	RBIDZ	15825
		16817
		16789
		16788
		16787
		16786



Figure 4-1: Relevant properties

5 Project Description

The proposed project entails:

- A Solar Plant, Water Extraction, and Bottling Plant (Green Park) which will be located on Erf 16789. This site will be used for air-to-water installations along with a bottling plant. The site will also be used for the installation of a ground-mount solar plant.
- Nyanza 80 000 tpa TiO₂ Pigment Plant which will produce 80 000 tpa pigment of the Titanium Dioxide (TiO₂) nature. The plant has an expected life of 60 years.
- Services required will include:
 - A service road;
 - A services area;
 - A pump station to pump potable water to the Nyanza Technical Services Centre (TSC) from the storage tanks;
 - An air-to-water plant located in the services area. Space is set aside for the installation of additional gable structure for the air-to-water generators in the future;
 - A storm water culvert spanned by a bridge along the site's western side to give personnel access from the TSC;
 - A water bottling plant located north of the air-to-water plant; and
 - Parking.

The project layout plan is provided in Figure 5-1 and Appendix C.

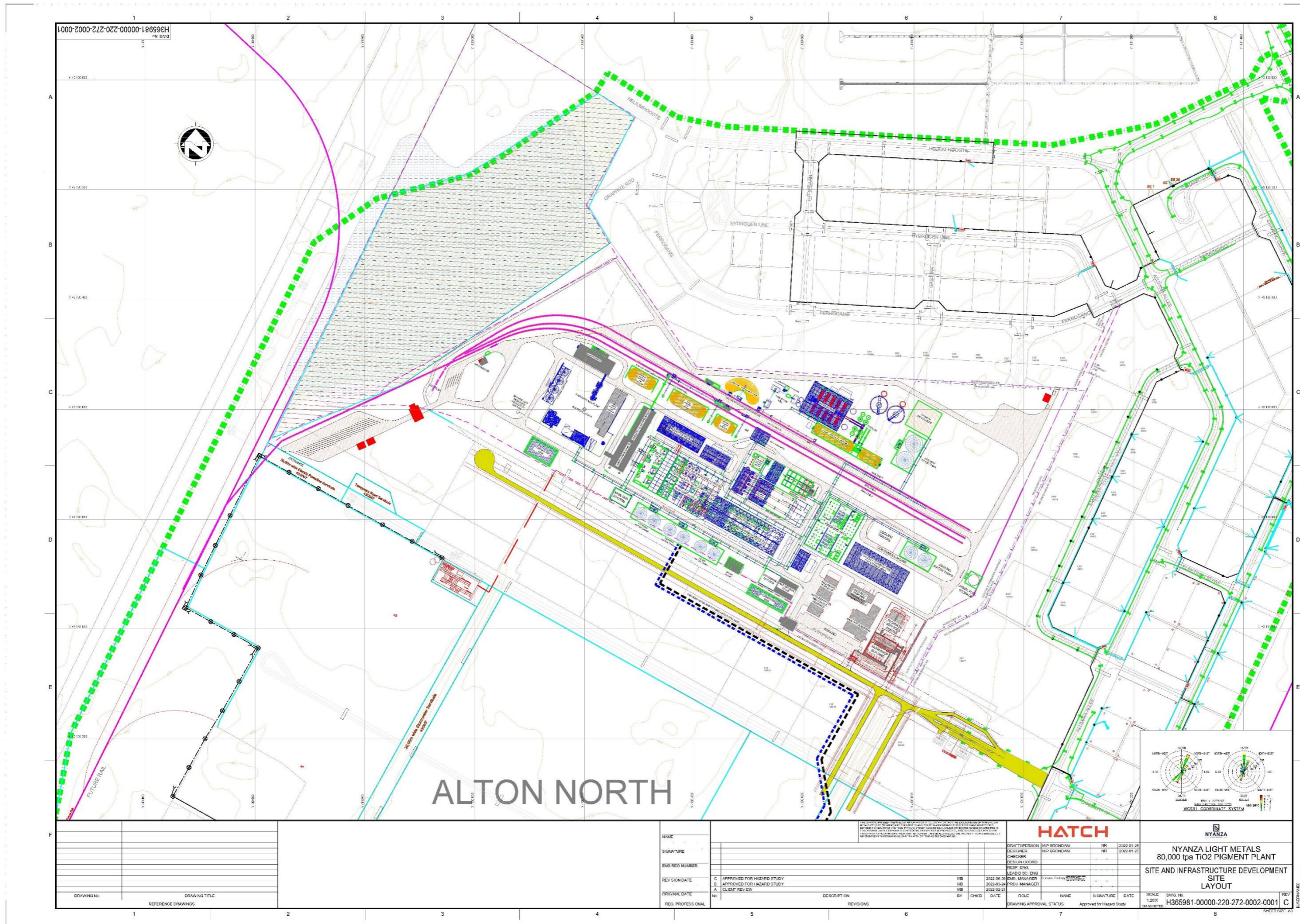


Figure 5-1: Project Layout Plan

5.1 Solar Plant, Water Extraction, and Bottling Plant (Green Park)

Approximately 5.7 ha of erf 16789 will be set aside for the “Green Park” which includes air-to-water installations, a bottling plant as well as a ground-mount solar plant.

The air-to water installation’s purpose is to supply the Nyanza Technical Services Centre (TSC) with water and to create a business opportunity to involve a local entrepreneur to extract atmospheric moisture and bottle this water for sale into the local Richards Bay market. Installation of the air-to-water process will be conducted in two phases as follows:

- Phase 1 will supply the TSC with water, where eight (8) water extraction units will be installed to produce 10 m³ (or 10 kl) of water per day.
- Phase 2 will supply the bottling plant with water, including the bottling plant. Phase 2 will produce an additional 10 m³ of water per day to be bottled.

Ground-mount solar panels will be installed on the remainder of the Green Park. Assuming a 25 m servitude along the culvert of the 5.7 ha Green Park, and a 3 m building line along the other boundaries, 4.9 ha remains. Approximately 0.3 ha is used for the water and bottling plant, leaving approximately 4.6 ha for the ground-mount solar panels. The general rule for the solar installations is 1 ha per 1 MW resulting in space for approximately 4.5 MW ground-mounted solar panels.

Areas where the solar panels will be installed include the roofs of the air-to-water plant’s gable structures and the roof of the bottling plant. The concept layout is as follows:

- A service road is located along the site’s western edge;
- The services area located in the site’s south-western corner connects to services and a pump station to pump potable water to the TSC from the storage tanks;
- The air-to-water plant is located on the services area’s northern side. Space is set aside for the installation of additional gable structures for the air-to-water generators in the future;
- The storm water culvert is spanned by a bridge along the site’s western side to give personnel access from the TSC;
- The water bottling plant is located North of the air-to-water plant. A paved section on the bottling plant’s western side provides turning area for delivery vehicles;
- Parking is provided North of the bottling plant; and
- The service road continues around the site’s northern edge as a gravel road.

5.2 Nyanza 80 000 tpa TiO₂ Pigment Plant

The project will produce 80 000 tpa pigment of the Titanium Dioxide (TiO₂) nature. The plant has an expected life of 60 years. Ilmenite will be the feedstock (the design is based on Tellnes ilmenite) and/or conventional sulfatable slag (the design is based on RBM slag) and waste slag from the Erstwhile Highveld Steel Plant (HSS). Provision is made in the design for a blend of any portions of these feedstocks (TCSG, 2022).

Operation of the plant will be 24 hours per day, 365 days per year. The design assumption when considering planned maintenance shuts and unplanned production outages is that on-line time of the plant will be 85%. Emergency power provision and redundancy provision is made on all critical reduction equipment to ensure that on-line time is 100% (TCSG, 2022).

5.2.1 Overview of the Process

The manufacture of TiO₂ via the sulfate process consists of the manufacture of the pure untreated TiO₂ (referred to as Calciner Discharge or 'CD') and the disaggregation and surface treatment of the CD (referred to as 'Finishing') (TCSG, 2022).

Conventional slag, ilmenite, and waste slag from the Highveld Steel site (Highveld Steel Slag (HSS)) will be used as feedstocks. Dried ilmenite or slag from HSS is pulverised and mixed with concentrated sulfuric acid. Water or steam is injected to initiate the reaction. The cake is allowed to mature and dissolved in water or recycled dilute sulfuric acid.

Ferric ions in solution are reduced to the ferrous state but a small proportion of titanous ions must also be reduced to the titanous state (Ti³⁺), to ensure the reduction of ferric species.

The solution is filtered to remove solids. The filtrate is cooled under vacuum, precipitating FeSO₄ as copperas (ferrous sulfate – FeSO₄·7H₂O). The copperas can be used in sewage water treatment and as raw material for iron oxide pigment. Alternatively, the filtrate can be roasted to Fe₂O₃ and SO₂, thereby recovering sulfuric acid.

The final solution is thermally hydrolysed to TiO₂, according to the reaction below. For higher yields, TiO₂ nuclei are added. Hydrous titania is collected and washed with weak acid. The product is bleached with acid and mixed with aluminium powder. The titania is finally dried, calcined and processed.

Spent acid (20–28% H₂SO₄) is concentrated to 70–80% and reused. In another approach, the spent acid is neutralised with lime. Alternatively, the spent acid can be used in the fertiliser industry.

The key stages in the manufacture of CD through sulfate technology are (TCSG, 2022):

- Milling of the feedstock to the optimal size fraction;
- Digestion of the TiO₂ feedstock with sulfuric acid (H₂SO₄);
- Reduction of the ferric iron, Fe³⁺ in the titanyl sulfate solution ('black liquor') to Fe²⁺ with iron (Fe) if needed;
- Formation of adequate titanium ions (Ti³⁺) in the black liquor by further reduction with Fe if needed;
- Oxidation of excess Ti³⁺ in the black liquor if needed;
- Separation of solid impurities from the black liquor;
- Removal of excess Fe from the black liquor and/or removal of excess aluminium from the black liquor and re-concentration of the black liquor (if necessary);
- Preparation of seed crystals ('nuclei') for precipitation in hydrolysis and reutilisation in the calciner;
- Hydrolysis of the titanyl sulfate to form an insoluble hydrous TiO₂ precipitate;
- Washing and bleaching of remaining impurities;
- Conditioning of the hydrous TiO₂ precipitate prior to calcination; and
- Calcination to drive off water and acid and to grow the TiO₂ crystals, yielding pure dry TiO₂.

The TiO₂ that emerges from the calciner will be disaggregated, coated with oxides or hydroxides of aluminium, silicon, phosphorous and/or zirconium and then washed, dried and deagglomerated before packing as a final product (TCSG, 2022).

The process flow chart is provided in Figure 5-2

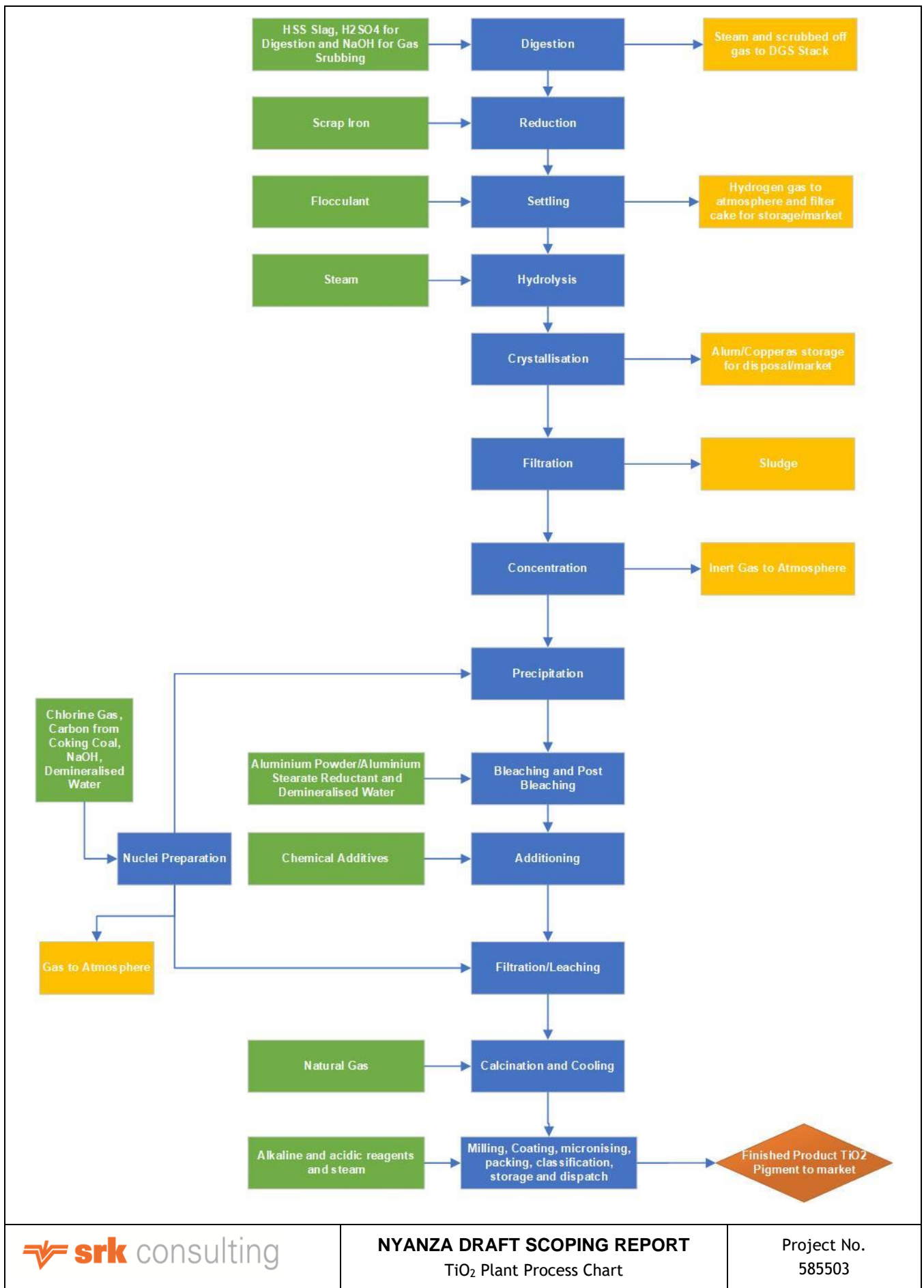


Figure 5-2: TiO₂ Plant Process Chart

5.2.2 Ancillary Processes

The required ancillary process units include (TCSG, 2022):

- Scrubbing of digestion off-gas;
- Recovery of titanyl sulfate solution from digester solid residues and neutralisation of the digester solid residues;
- Re-concentration of strong waste acid for recycling to the main process;
- Neutralisation of remaining waste acid to pH 7.2;
- Dewatering of gypsum;
- Scrubbing of the calciner off-gas;
- Preparation of the surface treatment and calciner additioning chemicals; and
- Buffer storage facilities in the main TiO₂ plant for copperas and ammonium aluminium sulfate and handling facilities for loading and dispatch of these.

5.2.3 Other Processes

Other process units required for the project are (TCSG, 2022):

- A 2 000 tons/day sulfur-burning sulfuric acid plant ;
- A water demineralisation plant;
- A compressed air plant for plant air and instrument air;
- Vacuum generation plant;
- A lime slaking plant;
- Water cooling plant(s); and
- Steam boilers.

5.3 Raw Materials, Services, Products, and Wastes Stored on Site

Ideally all high-volume raw materials, products, and waste will be delivered to and dispatched from site by rail via an on-site rail siding with limited shunting capacity. The bulk of the shunting will be done in the Transnet rail yard situated west of the Nyanza site and this rail yard will be connected with the rail siding on the Nyanza site. The rail siding has been authorised under EA Ref 14/12/16/3/3/1/1382/AM1 that was issued to the RBIDZ in 2016 and amendment issued in 2021. It is unlikely that this it will be feasible to handle all high-volume bulk by rail within the foreseeable future, but possible in future and the design provision will be made for this (TCSG, 2022).

Note

The design and installation of the rail connection from the Transnet shunting yard to the 1F site is being progressed by a separate task team and does not form part of this project (TCSG, 2022).

Nyanza has engaged in discussions with other service providers on doing the logistics of bulk, raw materials, chemicals and products on behalf of Nyanza (TCSG, 2022).

Considering the above, key design assumptions are (TCSG, 2022):

- HSS will be railed to site in gondolas;

- Conventional sulfatable slag will be transported by road from RBM. This will be managed by Grindrod Logistics and the slag will be transported to a Grindrod facility from where it will be transported to site by road* or by rail (gondola) (still to be determined);
- Ilmenite will be imported into the Richards Bay harbour from where it will be handled by Grindrod logistics and transported to a Grindrod facility from where it will be transported to site by road* or by rail* (still to be determined);
- Sulfur will be imported into the Richards Bay harbour from where it will be handled by Grindrod logistics and transported to a Grindrod facility from where it will be transported to site by road* or by rail* (still to be determined);
- Limestone will be imported by rail in gondolas;
- Gypsum will be exported by rail in gondolas;
- Alum, copperas, and digester sludge will be exported from site by road in bulk. Provision will be made for doing this by rail in future;
- Ammonium sulfate powder will be imported by road in bulk tankers. Provision will be made for doing this by rail in future. Steinweg will manage the logistics thereof; and
- All other raw materials, chemicals, products, and co-products will be transported by road and Steinweg will manage the logistics thereof.

5.3.1 Rail Siding and Loading/Offloading Facility

The high-volume raw materials, products, and wastes delivered to and from site via the authorised rail siding will conceptually need two ballasted railway tracks with a slabbed track in-between. This will converge into a single rail track connecting to the Transnet yard on the western side of the Nyanza site onto the site.

Estimated volumes of the high-volume materials are reflected in Table 5-1 (TCSG, 2022).

Table 5-1: Estimated rail activity

Product	Usage		Estimated delivery schedule (every x number of days)	Volume per shipment (m ³)	In/out bound
	tons per day	m ³ per day			
RBM Slag/ilmenite	319	145	7	1 016	In
HSS	480	234	14	3 278	In
Sulfur	953.3	1 325	1	1 325	In
Limestone (as dry)	648	463	1	463	In
Ammonium sulfate powder	128	144	14	2 013	In
Gypsum to NPC @18% moisture	645	445	1	445	Out

Product	Usage		Estimated delivery schedule (every x number of days)	Volume per shipment (m ³)	In/out bound
	tons per day	m ³ per day			
Sludge @50% solids	731	518	1	518	Out
Copperas @95% solids	460	418	1	418	Out
Alum @70% solids	761	445	1	445	Out

5.3.2 Raw Materials Handling and Storage

The proposed plant will require onsite storage of chemicals and hydrocarbons including:

- Titanium tetrachloride (TiCl₄);
- Titanium oxychloride (TiOCl₂);
- Calcium hydroxide [Ca(OH)₂];
- Sulphuric acid [H₂SO₄] (as 98.0 to 104%); and
- Diesel.

The raw materials required will include:

- Dry Bulk which will include:
 - Feedstock which will be stored at a nearby Grindrod site, from where it will be transported by road (future rail) to the Nyanza site where it will be discharged into and stored in an enclosed warehouse (TCSG, 2022). The enclosed warehouse will have the capacity to store a total of 14 days' worth of stock in six storage bays separated by concrete walls. This is to allow for 2 bays for each of ilmenite, conventional slag and HSS, one bay in operation and one bay for feedstock to have sufficient residence time to drain free moisture (TCSG, 2022). Feedstock will be collected from the selected storage bay by front-end loader and discharged into one of three discharge hoppers from where it will be conveyed to the feedstock milling plant (TCSG, 2022).
 - Sulfur: Bulk sulfur storage in enclosed warehouses will be stored by Grindrod on a nearby Grindrod site and will be transported from the Grindrod site by road* (future rail) to the Nyanza site where it will be discharged into and stored in silos (TCSG, 2022).
 - Ammonium Sulfate: This will be imported to site in bulk and discharged into a storage silo from where it is conveyed (by pneumatic conveyance) to the aluminium removal process section (TCSG, 2022).
 - Limestone: Limestone will be imported by rail in gondolas. It is to be off-loaded and transported to an open storage area nearby the gypsum plant (TCSG, 2022).
- Liquid Bulk including:
 - Chlorine: Chlorine will be imported to site by road in specialised bulk 900kg containers (TCSG, 2022).
 - Sodium Hydroxide: Sodium hydroxide will be imported to site by road tanker and discharged into on-site storage tanks (provision will be made for 14 days' worth of

storage capacity). The sodium hydroxide will then be used in the following process sections (TCSG, 2022):

- TiCl_4 nuclei;
 - Sodium titanate nuclei preparation;
 - Digester off-gas scrubbing; and
 - Coating.
- Titanium Tetrachloride will be imported to site by road in and stored onsite into storage tanks (TCSG, 2022). From the storage tanks it is pumped to the TiCl_4 nuclei preparation plant (TCSG, 2022).
- Other Aqueous Raw Materials Receiving and Storage
 - Other aqueous raw materials will be imported to site by road and will be offloaded in a purpose-designed enclosed store (ca 100 m² floor space) (TCSG, 2022). The drums will be transported from the store to the relevant process section by forklift (TCSG, 2022). Provision has been made for storage capacity for 28 days' worth of usage (TCSG, 2022).
 - Other Solids Raw Materials Receiving and Storage: Other solids raw materials will be imported to site by road in 25 kg bags, 0.5 tonne bulk bags or 1 tonne bulk bags and will be offloaded in a purpose-designed enclosed store (ca 100m² floor space) (TCSG, 2022). The bags will be transported from the store to the relevant process section by forklift (TCSG, 2022). Provision will be made to cater for 28 days' worth of usage (TCSG, 2022).
 - Packing Materials Receiving and Storage: 25 kg bags, 0.5 tonne bulk bags and 1.0 tonne bulk bags will be imported to site by road and offloaded into a separate enclosed store (ca 100 m² floor space) for the purpose . The bags will be transported to the packaging area by forklift (TCSG, 2022).
 - Recycled Containers Storage and Handling: A facility will be provided for the collection of used containers where it can be cleaned and temporarily stored for dispatch by road off-site (TCSG, 2022).
 - Pallet Receipt, Storage Issue & Recycling: A facility will be provided for the receipt and storage of clean product pallets. The pallets will be transported to the packaging area by forklift (TCSG, 2022). In addition, a facility will be provided for the collection of used pallets where it can be cleaned and temporarily stored for dispatch by road off-site (TCSG, 2022).
 - Process Consumables Receiving & Storage: Two separate enclosed storage areas will be provided for storage of process consumables, which will include hazardous chemicals in small quantities, filter cloths, cleaning materials and tools, etc (TCSG, 2022).
 - Fuel Storage: Provision will be made for diesel tanks for storing diesel on site (TCSG, 2022).
 - Diesel will be imported to site by road and will be discharged into vehicles and forklifts with standard metered fuel discharge pumps and nozzles (TCSG, 2022).

Table 5-2 provides a summary of the raw materials, chemicals, by products, core products and waste to be stored on site.

Table 5-2: Raw Materials, Chemicals, By Products, Core Products and Waste to be Stored on Site

	m ³ per annum	m ³ per day	Transport mode	No of days storage on site	On site storage [m ³]
Feedstock	117 561	379			
RBM Slag/ilmenite	44 979	145	Rail - box cars or pneumatic	9	1 306
HSS	72 582	234	Rail - box cars	9	2 2107
Chemicals					
Sulphur [S]	41 075	1 325	Rail - box cars or pneumatic	3	3 975
Fe scrap [Fe]	2 798	9	Road - bales/bags	11	99
Limestone [CaCO ₃] (as dry)	143 586	463	Rail - box cars	5	2 316
Ammonium sulphate powder [(NH ₄) ₂ SO ₄]	44 584	144	Rail - box cars or pneumatic	18	2 589
Caustic soda [NaOH] (as 50%)	12 715	41	Road tanker	5	205
Chlorine (Cl ₂) liquid	2 444	8	Road tanker - specialised	11	87
Coking coal	807	2.6	Rail/road bulk	32	83
Titanium tetrachloride (TiCl ₄)	2 370	7.6	Road - specialised containers	32	245
Aluminium sulphate [Al ₂ (SO ₄) ₃]	994	3.2	Road - bags/drums	11	35
Potassium carbonate [K ₂ CO ₃]	292	0.9	Road - bags/drums	18	17
Monoammonium phosphate [MAP - NH ₄ H ₂ PO ₄]	240	0.8	Road - bags/drums	18	14
Sodium nitrate [NaNO ₃]	0	0.0	Road - bags	18	0
Sodium silicate [Na ₂ O:SiO ₂]	986	3.2	Road - drums	11	35
Sodium aluminate [NaAlO ₂]	1 237	4.0	Road - drums	18	72
Dicalite [volcanic ash]	3 379	10.9	Road - bags	11	120
Trimethyl phosphate [TMP - C ₃ H ₉ O ₄ P]	267	0.9	Road - drums	18	15
Monoethanolamine [MEA - C ₂ H ₇ NO]	251	0.8	Road - drums	18	15
Zircon beads [ZrO ₂]	27	0.1	Road - bags/drums	94	8
Aluminium powder [Al]	65	0.2	Road - bags/drums	32	7
Flocculent	62	0.2	Road - bags/drums	64	13
Intermediate materials produced on site					
Titanium tetrachloride (TiCl ₄)	2 370	8		32	245
Titanium oxychloride (TiOCl ₂)	9 379	30		4	121
Calcium hydroxide [Ca(OH) ₂]	58 331	188		2	376
Sulphuric acid [H ₂ SO ₄] (as 98.0 - 104%)	374 900	1 209		21	25 396
Demineralised water				2	16 407
Steam					
WAC acid recycled (as 68%)	43 557	141		1	222
WAC salts	49 144	159		2	587
Products, co-products & wastes					
TiO ₂	72 727	235	Road - bags	5	1 173
Sulphuric acid [H ₂ SO ₄] (as 98.0 - 104%)	188 692	609	Road tanker	5	3 043
Gypsum (as dry)					
Gypsum to NPC @18% moisture	137 931	445	Rail - box cars	5	2 225
Sludge @50% solids	160 725	518	Road bulk	5	2 592
Copperas @95% solids	129 726	418	Rail - box cars	5	2 092
Alum [NH ₄ Al(SO ₄) ₂ .12H ₂ O] @70% solids	137 923	445	Rail - box cars or pneumatic	5	2 225

	m ³ per annum	m ³ per day	Transport mode	No of days storage on site	On site storage [m ³]
Sulfur Ash	2 015	6.5	Tipper trucks	10	65
Liquid Effluent	5 245 032	16 919	Piped - sea outfall pipeline	2	33 839

5.3.3 Co-products and Wastes

Open-air storage areas will include:

- Gypsum with an low moisture content to be dispatched by rail to cement manufacturers;
- Copperas to be dispatched by road/rail to customers;
- Alum to be dispatched by road/rail to customers;
- Digester sludge to be dispatched by road/rail to customers or to a landfill site; and
- Sulphur ash to be stored for disposal.

Facilities for the collection, temporary storage, and dispatch by road of small volumes of wastes requiring regulated dry disposal wet disposal will be provided (TCSG, 2022).

5.3.4 Effluent Sea Outfall Discharge

Effluent from the collection reservoirs will be pumped to the sea through the existing sea outfall pipeline (TCSG, 2022). The design assumptions are that the instantaneous volume to be pumped through the sea outfall pipeline will be 40% higher than the average volume of liquid effluent emanating from the site (TCSG, 2022).

5.4 Existing Infrastructure and Resources Required for Construction and Operation

The RBIDZ owns and operates the following services and utilities which will be made available to Nyanza (TCSG, 2022):

- Water supplied 'over-the-fence' to on-site water storage facilities;
- Electricity supplied 'over-the-fence' with on-site pressure reduction and distribution;
- Gas supplied 'over-the-fence' with on-site pressure reduction and distribution;
- Neutralised waste liquid settling and buffer storage on-site – for discharge through a sea outfall pipeline which is out of scope; and
- A railway siding with loading and off-loading facilities on-site – shunting facilities will be provided off-site.

Space provision will be made for (TCSG, 2022):

- A colour pigments plant using iron sulfate as feedstock;
- A gypsum board manufacturing plant; and
- A copperas mono-hydrate plant.

5.4.1 Water

A summary of the water requirements is provided in Table 5-3.

Table 5-3: Water Requirements

Nyanza water requirement for 80ktpa TiO ₂ plant	m ³ per annum	m ³ per day at on-line time of 310 days per annum
Total potable water	3 150 261	10 162
Total process water	2 730 997	8 810
Total cooling water	3 335 289	10 759

Potable Water

Potable water will be required for use in some process areas, notably for the water demineralisation plant and for general site use (TCSG, 2022). Water from the external supply point will be piped into storage reservoirs on site, with sufficient capacity for 2 days' supply to the site. A pump station installed at the reservoirs will distribute water to off-take points on the site (TCSG, 2022).

Process and Cooling Water

Water from the external supply point will be piped into storage reservoirs on site, with sufficient capacity for 2 days' supply to the site. A pump station installed at the reservoirs will distribute water to off-take points on the site (TCSG, 2022). Process water, which has a less stringent quality requirement, will mostly be used in the process (TCSG, 2022).

Cooling water will either be from process water or filtered sea water (TCSG, 2022). Sources of water supply to the site are currently under investigation. For design purposes it is assumed that process water will be used for cooling as well, but the design will be adjusted if it proves feasible to use sea water as cooling water instead (TCSG, 2022).

Water cooling will be undertaken in the individual process sections (TCSG, 2022).

Demineralised Water

Demineralised water will be produced on-site to suitable quality as follows (TCSG, 2022):

- Hardness: 0.5 mg-eq/dm³
- Salt content: max 100 mg/dm³
- Iron content: 0.2 mg/dm³
- pH value: 6.5 to 7.5
- Temperature: 18 to 40°C

Demineralised water will be piped to off-take points at the boundaries of the various processing areas (TCSG, 2022).

5.4.2 Compressed Air

Compressed air will be generated on-site (TCSG, 2022) as follows:

- Compressed air for general use will conform to ISO 8573.1: 2001: Class 2.4.2 (TCSG, 2022).
- Compressed air for instrumentation will conform to ISO 8573.1: 2001: Class 2.1.1 (TCSG, 2022).

5.4.3 Steam

High pressure and low-pressure steam as heat source will be piped from the sulfuric acid plant and an on-site boiler plant (TCSG, 2022):

5.4.4 Gas

Gas as heat source will be supplied 'over-the-fence' – calorific value: 8 100 kcal/Nm³ (TCSG, 2022).

A single natural gas off-take point will be established on site. An on-site pressure reducing station in the vicinity of the off-take point will reduce the pressure to 0.35 Mpa. Gas will be piped from the reducing station to off-take points at the boundaries of the various processing areas (TCSG, 2022).

An EIA for the gas pipeline will be undertaken as a separate process.

5.4.5 Electricity

Electricity will be supplied 'over-the-fence'. Electricity supply pressure will be 11 kV, and this will be reduced and distributed on-site (TCSG, 2022). 11 kV feed from an RBIDZ off-take point will be routed to a main on-site substation where it will be reduced to 3.3 kV and 380 V and then distributed to various off-take points (electric power supply will be 3.3 kV 50 Hz 3 Ø to power electric motors ≥ 300 kW and 380 V 50 Hz 3 Ø for electric motors < 300 kW. Instrument electric power supply will be 110 V 50 Hz single phase) (TCSG, 2022).

Design provision will be made for installing solar panels on the roofs of all non-process buildings (TCSG, 2022). Solar rooftop installation will contribute another ca. 0.4MW of electric power, so the total solar power generated on the Nyanza main site will be approximately 5.3MW. Other than site levelling and the provision of gravel service roads, only the ground-mount solar panels and weatherproof enclosures for the solar panel control systems will be constructed in the area where the ground-mount solar panels are to be installed. These will be connected to the site power supply in the TSC and main site substations (Nyanza, 2021).

In addition, ground-mount solar panels will be installed in the Green Park as described in Section 5.1 (Nyanza, 2021).

Steam turbines will be installed to generate electricity with the steam from the sulfuric acid plant. Steam is generated by the exothermic reaction taking place when producing sulfuric acid with the sulfur-burning process.

Table 5-4: Power generated from steam turbines at 2 000 tonnes of H₂SO₄ per day

Sulfuric acid production	2 000 tonnes per day
Steam generated	2 200.0 tonnes per day
Power from steam	24 MW

5.4.6 Vacuum

Vacuum will be generated locally in the relevant process sections (TCSG, 2022).

5.4.7 Waste

Effluent will be piped from connection points at the various process buildings to the waste acid neutralisation plant where it will be neutralised (TCSG, 2022).

Effluent collection reservoirs with 2 days' worth of storage capacity will be constructed on site – that will serve to homogenise the effluent before discharge. A pump station at the reservoirs will pump the effluent into the discharge line (TCSG, 2022).

The assumptions regarding waste treatment are (TCSG, 2022):

- All gaseous emissions are treated in accordance with general standards employed in the European Union, except as prescribed by the specific South African air emission limits provided in the NEM:AQA;
- A 3-stage Chematur Eco planning Oy acid re-concentration plant will be installed to concentrate the waste acid to an acid concentration of 68%, and the maximum economic volume of concentrated acidic liquid effluent for re-use in the TiO₂ plant will be re-concentrated and recycled to the process;
- The remainder of this liquid acid effluent is neutralised to pH7.2 and gypsum is produced. Gypsum³ as a product for use by NPC is dewatered/dried to a moisture content of about 18%. The balance of the gypsum is slurried with liquid effluent and discharged through the sea outfall pipeline;
- Digestion sludge is washed and filtered, and then neutralised by mixing with slaked lime Ca(OH)₂ and sold as a brick/tile colourant; and
- ⁴Copperas is sold as a co-product.

Digestion Off-gas

Off-gas is generated by the violent reaction of sulfuric acid with feedstock. Where batch digestion is employed the volume of gas discharged is variable (TCSG, 2022).

When digesting ilmenite or HSS, the exhaust gases are composed of air, steam, acid droplets, acid mist, SO₃ and sulfuric acid and dust carried over from the feedstock. Treatment will be by water scrubbing, which can remove the steam, most of the acid droplets, a substantial part of the acid mist and most of the feedstock dust. Water scrubbing would be through a venturi scrubber (TCSG, 2022).

When digesting slag, exhaust gases are composed of all the above, plus SO₂ and H₂S which results from the reduction of sulfuric acid by Ti³⁺. These gases are relatively insoluble in warm low pH water,

³ Gypsum is a soft sulfate mineral composed of calcium sulfate dihydrate, with the chemical formula CaSO₄·2H₂O. It is widely mined and is used as a fertilizer and as the main constituent in many forms of plaster, blackboard/sidewalk chalk, and drywall.

⁴ Copperas green crystals of hydrated ferrous sulphate, especially as an industrial product

so they would not be removed by the water scrubber and the gas must be scrubbed with a weak caustic solution. SO₂ is removed as sodium sulphite and H₂S is removed as sodium sulphide. Both the sulphite and the sulphide will decompose at low pH, releasing SO₂ and H₂S, so great care must be taken in the disposal of spent caustic; it will be necessary to oxidise the sulphite and sulphide to sulfate prior to discharge (TCSG, 2022).

Calcination Off-gas

Calcination off-gas comprises principally N₂, CO₂ and O₂ saturated with water vapour, with traces of TiO₂ dust, SO₂ and SO₃ (TCSG, 2022).

Treatment will be scrubbing with pre-bleach filtrates to cool the gas and, at the same time, increase the sulfuric acid concentration of the pre-bleach filtrates to about 30%. A second stage of water scrubbing further removes TiO₂ dust and SO₃, followed by electrostatic precipitation to remove acid mist. Scrubbing water and precipitation washings are recycled to the pre-bleach washing stage. SO₂ is removed by passing the gas through a bed of activated carbon granules irrigated with water, where SO₂ is catalytically oxidised and then dissolved in water (the Sulfacid™ catalytic converter system) (TCSG, 2022).

Condensation Tail Gas

The tail gas emanating from condensation of the TiCl₄ in the TiOCl₂ plant will be scrubbed on plant. The dilute HCl from tail gas scrubbing will be directed to a buffer tank with a discharge pump for pumping to the waste acid neutralisation plant (TCSG, 2022).

Neutralisation Off-gas

CO₂ results from neutralisation of strong waste acid with limestone. CO₂ emissions will not be treated (TCSG, 2022).

An option to be investigated is to recover and filter the CO₂ to be used in carbonated water ('sparkling water') and/or carbonated drinks ('soft drinks') but this is not in scope (TCSG, 2022).

Other Gases

Combustion gases from heaters and driers, and water vapour from cooling towers are not treated (TCSG, 2022).

Digestion Sludge

The non-dissolved fraction of the feedstock after digestion is referred to as digestion sludge. It will be filtered from the liquor and neutralised by dry mixing with slaked lime and sold as brick/tile colourant. This will be dispatched by road (TCSG, 2022).

Copperas

Copperas (FeSO₄·7H₂O) is generated with the removal of iron from the black liquor when digesting ilmenite⁵ and will be dispatched by rail (TCSG, 2022).

Space provision will be made to dry the copperas on site to a monohydrate in future if this is found to be necessary as a value-add (TCSG, 2022).

Potential market uses for copperas to be investigated include (TCSG, 2022):

- Soil amelioration (for soils poor in iron);

⁵ **ilmenite**, iron-black, heavy, metallic oxide mineral, composed of iron and titanium oxide (FeTiO₃), that is used as the major source of titanium.

- Animal feed supplement (iron);
- A reductant to reduce hexavalent chromium (Cr^{6+}) to trivalent chromium (Cr^{3+}) in cement (to make this less harmful and avoid contact dermatitis);
- Colourant to stain concrete, limestone, sandstone, wood, bricks or tiles;
- Nutritional supplement to fortify foods and to treat iron-deficiency anaemia;
- Treating of iron chlorosis in plants;
- Water purification as flocculant and for phosphate removal in municipal and industrial sewage treatment plants to prevent eutrophication of surface water bodies;
- Treatment for wood panelling either alone, dissolved in water, or as a component of water-based paint; and
- Reagent in the identification of mushrooms.

Liquid Effluent Treatment

The strong acid waste streams (ca. 20% Sulfuric acid) originate from the first washing stage after hydrolysis (TCSG, 2022). The most economic volume of strong waste acid will be re-concentrated for recycling in the TiO_2 process. A 3-stage Chematur Eco planning Oy acid re-concentration plant, concentrating the waste acid to 68%, is included in the project scope (TCSG, 2022).

Salts from the reconcentration process (principally $\text{FeSO}_4 \cdot \text{H}_2\text{O}$) will be precipitated and filtered from the concentrated acid. These salts will then either be dispatched by road to a client or mixed with concentrated waste acid to be neutralised (TCSG, 2022).

The remainder of the strong waste acid effluent will be neutralised to a pH of about 5.2 with crushed limestone. The resulting slurry will be filtered and the filtrates, along with the weak acid filtrates will be neutralised with slaked lime along with all other effluent to a pH of about 7.4. The resulting slurry will be filtered and settled. The settled sludge will be pumped through filters to dewater it (TCSG, 2022). Up to 200 000 tonnes per annum of the gypsum will filtered to a moisture content of about 18%. This gypsum will be conveyed into a silo from where it will be loaded onto the rail trucks for dispatch to NPC (TCSG, 2022). The remainder of the gypsum will be filtered to about 50% moisture content (TCSG, 2022).

The clear filtrates from settling will be pumped to a buffer tank from where it is pumped through the sea outfall pipeline (TCSG, 2022).

Slaked lime will be produced from limestone in an on-site slaking plant. The current assumption is that the quicklime (CaO) produced from the limestone in the kiln will be hydrated with water at 5 times stoichiometric requirement to produce slaked lime ($\text{Ca}(\text{OH})_2$) (TCSG, 2022).

The 50% moisture content gypsum will be transported to other end destinations by rail (TCSG, 2022).

Waste Acid Concentration

Iron sulfate ($\text{FeSO}_4 \cdot \text{H}_2\text{O}$) is formed as a crystalline solid waste in the acid reconcentration process (TCSG, 2022).

5.4.8 General Buildings and Infrastructure

The general services, utilities, and infrastructure include (TCSG, 2022):

- Offices for administration, management and supervision;
- Stores (raw materials, consumables and maintenance spares);

- Maintenance workshops; maintenance workshops;
- Canteen/meal room facilities;
- Changeroom facilities;
- Emergency response facilities; and
- Infrastructure and non-plant services e.g., roads, drainage, fencing, and access control.

Main Office Block

Functions to be accommodated in the main office block are generally (TCSG, 2022):

- Site and operations administration and management;
- Engineering and projects;
- In-process analytical laboratory; and
- Staff canteen (which would double as a meeting room for large meeting groups).

In-process Laboratory

The project will include an in-process analytical laboratory.

Workshops

Engineering workshops made of individual workshops will be included (TCSG, 2022):

Changerooms

Changeroom facilities with ablutions, showers, lockers and receipt and issue facilities for laundry as per industrial standards (laundry will be done off-site by others) (TCSG, 2022).

Stores

Separate storage facilities will be provided for (TCSG, 2022):

- Solid bagged raw materials and chemicals;
- Liquid raw materials and chemicals in small transportable containers (e.g., drums; Packing materials to be issued to the product packing area;
- Maintenance spares and general consumables (150m² floor space);
- A lay-down area will be provided for large maintenance spares (agitators, rollers etc.);
- Storage of used FBC's with sufficient access for the FBC supplier to access and remove the used FBC's; and
- Receipt, storage, issue and return of pallets.

Emergency Response Facilities

The project will include emergency response facilities e.g., firefighting, first aid, and clinic services (TCSG, 2022).

Technical Services Centre (TSC) Re-configuration

The laboratory will be equipped for final product classification and customer technical services functions (TCSG, 2022). The TSC entrance for heavy vehicles will be used as access point to the eastern side of the operational area. An additional heavy vehicle access point is to be provided on the western end of the sulfuric acid plant (TCSG, 2022).

The TSC entrance for passenger vehicles will be used as access point for all passenger vehicles. The TSC parking area will be expanded for the commercial operation. The parking area should be fenced such that passengers can only access the operational area through dedicated turnstile type personnel gates with access control or through the main office reception (TCSG, 2022).

Site Access, Access Control, Security, and Fencing

On the basis that the Nyanza site is located inside a fenced-off customs area, perimeter fencing around the Nyanza site need only be suitable to prevent inadvertent access to the Nyanza site (TCSG, 2022).

A traffic impact assessment will be conducted to ensure vehicle flow and access to the various loading and unloading areas on the site, also considering space for heavy vehicle lay-by areas. An additional heavy vehicle entrance to the Nyanza site will likely be required towards the western end of the site (TCSG, 2022).

Drainage

Rainwater from all operations buildings will run off into drains (gutters and gutter run-off piping will be the design responsibility of the entity responsible for the design of the building). All surface rainwater from uncovered areas (including roads) will run off into drains. All drains will run off to the first flush stormwater collection system (TCSG, 2022).

Spillages from all operations areas will be contained within the particular area and drained to a dedicated sump(s) in the area where it will either be treated or piped to a treatment plant. Drains, sumps and treatment areas for individual process areas will be the design responsibility of the entity responsible for the design of that process area. After treatment it will be piped to the effluent collection tanks for discharge through the sea outfall pipeline. No process spillages whatsoever will be allowed to run off into rainwater drainage systems. Design provision must be made for pumping of the sump contents to the waste acid neutralisation plant (TCSG, 2022). Run-off from sub-soil drains will be collected and re-used on site (TCSG, 2022).

Contractors' Yard

A contractor's yard (not indicated on the general lay-out plan) needs to be established with a lay-down area for temporary offices, equipment and materials. Provision must be made for a meal room and changeroom for 50 persons in total (male and female). An area that can be considered for this is the north-east corner of the Nyanza site (TCSG, 2022).

5.4.9 Roads

Existing access roads will be used for access to and from the Nyanza site.

5.4.10 Sanitation

Sewage is collected from all ablutions and piped to discharge points for off-site discharge to the municipal sewage system (TCSG, 2022).

6 Alternatives Considered

A number of alternatives have been considered for the proposed project and are described in the following sections.

6.1 Site Alternatives

Over the last few years, various studies have been conducted by Nyanza to determine the best site location for the process to work effectively and efficiently. During these studies, it was identified that sulfuric acid would be needed to extract the Titanium from the slag acquired from Highveld Steel and Vanadium. Due to this, the locations which were assessed included the option of constructing an sulfuric acid plant. The following factors were considered as part of the site selection:

- Acid supply locations
- Distance from slag dump
- Electricity cost
- Acid supply cost
- Liquid effluent
- Solid waste landfill and distance to landfill
- Transport cost

These factors were applied to six different locations namely Middleburg, Coega, Maputo, Vryheid, Richards Bay and Rustenburg. Due to the site selection criteria, the two locations which were considered as part of the main site selection were Richards Bay and Middleburg. Once the alternatives had been narrowed down to two locations, the following key parameters were considered:

- Proximity to main feedstock which is near Witbank in Mpumalanga Province
- Transportation infrastructure / proximity to a port for bulk export of titanium products
- Availability and suitability of industrial land, infrastructure, services and utilities
- Proximity to key raw materials

6.1.1 Alternative 1 : Middleburg

Middleburg as a location was the closest to Highveld Steel and Vanadium resulting in the slag not having to be transported as far; however, the final Titanium product would still have to be transported via railway to Richards Bay Port as this is the closest port.

Although there were acceptable transportation options, namely the railway line from Witbank to Richards Bay, Nyanza would still have to install all supporting infrastructure, services and utilities.

Furthermore, The sulfuric acid which is needed to produce the final Titanium product would need to be transported just under 400 km to the plant, resulting in much higher transportation costs. For these reasons, the Middleburg alternative was discarded.

6.1.2 Alternative 2 (preferred alternative): Richards Bay

Richards Bay was the second furthest from Highveld Steel and Vanadium, however it was one of the closest to a port for bulk export of the final titanium product. In addition, a portion of land within Phase 1F of the RBIDZ, which had already installed key supporting infrastructure, services and utilities was available. Furthermore, the sulfuric acid required for the production of titanium pigment would be

sourced from nearby facilities like Foskor which is also located in Richards Bay. For the above reasons, the Richards Bay site was the most suitable site alternative, and thus this is where Phase 1, the Product Testing and Development Centre was developed. Due to the fact that Phase 1 is now already developed, there are no further site alternatives being pursued.

6.2 Technology Alternatives

Four beneficiation options of the discard furnace slag from Evraz Highveld were evaluated, smelting, physical upgrading, chlorination and sulfuric acid leaching process. The evaluation of the various typical titanium beneficiation processes revealed that smelting, physical upgrading and chlorination processes are unsuitable due to the high levels of metal impurities (Ca, Mg etc.) in the slag. As a result, the hydrometallurgical sulfuric acid leaching process route, commonly referred to as the "sulfate" process, was selected as the technically viable processing route for the study. The study was largely based on patents developed for Highveld slag specifically, with enhancements and additions as derived from test work.

In the technology selection phase various processing options were evaluated based on the possible processing routes, the proprietary information and confidentiality regarding certain processing routes, and accessibility to required reagents, technical know-how and operating skills requirements. Uncoated anatase was initially identified as a relatively simple titanium pigment product to produce; possibly at the lower ranges of typical production costs. Conceptual process engineering and costing continued on this basis, up to and including financial analyses of two different processing routes. Following the outcomes of the titanium pigment market study conducted by TZMI, however, the decision was made to target coated rutile as product. This required the incorporation of a rutile nuclei production step as well as a pigment finishing unit operation. The decision to change from uncoated anatase to coated rutile as final product was prompted by the limited and diminishing market for uncoated anatase. These additional process areas were incorporated into the design, and added to the cost estimates and resultant financial analyses"

6.3 Operational Options,

With respect to the use of sulfuric acid in the plant, there were 2 options considered, viz buying the sulfuric acid from other suppliers and making own acid on site. A decision was made to rather manufacture the sulfuric acid on site to reduce risks related to transportation as well as to reduce costs.

6.4 No-Go Option

The no-go alternative would entail not implementing the proposed 80 000 tpa TiO₂ Pigment Plant. The proposed plant will be located with the RBIDZ, and the no-go option would mean that development of the section of the RBIDZ 1F affected by the proposed project will not continue and the site will remain in its undeveloped state. The areas and wetland systems that are undeveloped on site will remain in their existing condition (NEMAI Consulting, 2016).

Not implementing the project means that the amount of land that is developable and available for lease to businesses in Richards Bay will remain at 345 ha and the RBIDZ objective to provide an economic environment promoting the creation of an industrial economy that is regionally diversified, will be restricted. This will impact the job creation, economic growth, income distribution to low-income households, and SMME simulation development. A further socio-economic assessment of the development was undertaken in 2014 and found that development would have a net positive value of R6.4 billion. The macroeconomic impact analyses for the RBIDZ indicated that developing Phase 1F will add about R23.8 billion to South Africa's GDP and will create 110 000 new jobs, of which 23 000 will be jobs for workers that are unskilled. Households will also benefit to an additional R15.6 billion in

household income, R2.6 billion which will expand to low-income households. The no-go option will result in a loss of the socio-economic benefits (NEMAI Consulting, 2016)

Currently, Africa imports 130 000 tonnes of TiO₂ pigment per year, while South Africa consumes about 35 000 tonnes (Global Africa Network, 2017). Nyanza will contribute 80 000 tonnes of TiO₂ pigment per annum. The largest quantity will be sold locally, while the remainder will be exported to other countries in Africa and the Middle East.

By not implementing this project approximately 1 750 potential jobs associated with the project will not be created, the local economic opportunities and revenue which could potentially have benefitted the local, regional and national economy would be lost. Not implementing the project will also result in loss opportunities in foreign exchange for South Africa will be incurred as the potential to sell the TiO₂ pigment internationally will be lost.

In addition, not implementing the project means that the waste product which will be used as the primary resource will not be used and will remain at Highveld Steel and Vanadium.

Although not fully assessed at this time, the additional potential negative impacts on the environment associated with project would not exist should the project not be implemented. The environmental, social and economic impacts will be assessed in detail during the impact assessment phase to identify and address all negative impacts, where possible.

7 Legal and Policy Framework

7.1 South African Environmental Legislation, Policies and Guidelines

Table 7-1 provides a summary of the applicable legislation, policies and guidelines identified as relevant to the proposed project. In addition, a description of how the proposed activity complies with and responds to the legislation and policy context, is provided. This list is not exhaustive but rather represents an indication of the most applicable pieces of environmental legislation relevant to the project.

Table 7-1: Policy and legislative context of proposed project

Legislation	Description and Relevance	Responsible Authority
Constitution of the Republic of South Africa, (Act No. 108 of 1996)	<p>In terms of Section 24, of the Constitution of the Republic of South Africa (108 of 1996), everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while prompting justifiable economic and social development. The needs of the environment, as well as affected parties, should thus be integrated into overall project management in order to fulfil the requirements of Section 24 of the Constitution.</p> <p>Chapter 2 encapsulates the Bill of Rights and Section 24 relates to Environmental Rights.</p> <p><i>The proposed activities shall be implemented in such a manner that significant environmental impacts are avoided, where significant impacts cannot all together be avoided, be minimised and mitigated (as per the Environmental Management Programme that will be compiled to guide the process) in order to protect the environmental rights of South Africans.</i></p>	N/A
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000) (PAIA)	<p>The Promotion of Access to Information Act (Act No. 2 of 2000) (PAIA) recognises that everyone has a right of access to any information held by the state and by another person when that information is required to exercise or protect any right. The purpose of the Act is to promote transparency and accountability in public and private bodies and to promote a society in which people have access to information that enables them to exercise and protect their right.</p> <p><i>The EIA/EMPr process will be undertaken in terms of the NEMA, where the associated stakeholder consultation process is aligned with the PAIA in the sense that all I&APs will be given an opportunity to register as an I&AP prior to the initiation of the project and all registered stakeholders were in turn provided a fair opportunity to review and comment on any reports submitted to the competent authorities for decision making.</i></p>	N/A
National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended (NEMA)	<p>The NEMA provides the overarching legislation for environmental governance in South Africa, giving effect to Section 24 of the Constitution of the Republic of South Africa. NEMA sets out the fundamental principles of Integrated Environmental Management that must be adhered to in order to ensure sustainable development. These principles should apply to environmental decision making. Of particular importance is NEMA's ruling that the interpretation of any law concerning the protection and management of the environment must be guided by the principles of NEMA. The core nature of the NEMA principles is the principle on sustainable development. This principle strives towards promoting development that is simultaneously meeting the needs of the present generations without compromising the needs of future generations to come. Section 24 relates to Environmental Authorisations (control of activities which may have a detrimental effect on the environment) and Section 28 relates to the duty of care and remediation of environmental damage.</p>	KZN EDTEA and the DFFE

Legislation	Description and Relevance	Responsible Authority																		
	<p><i>Environmental management principles will be incorporated into the EIA and EMP, which the applicant will be required to comply with to ensure that negative impacts on the environment are avoided or kept to a minimum and that positive impacts are enhanced. This project triggers Activity 2 and Activity 25 of GNR 983, Activity 4 and Activity 6 of GNR 984, and Activity 2 and Activity 14 of GNR 985. The table below provides a summary of the NEMA listed activities triggered by the proposed project.</i></p> <table border="1" data-bbox="568 456 1852 1431"> <thead> <tr> <th data-bbox="568 456 777 544">Activity Number:</th> <th data-bbox="777 456 1458 544">Relevant Activity (ies) as set out in Listing Notice 1, 2 & 3 (GN R327, GNR325 & GNR324)</th> <th data-bbox="1458 456 1852 544">Description of Activity as per the project description</th> </tr> </thead> <tbody> <tr> <td data-bbox="568 544 777 683">Activity 13</td> <td data-bbox="777 544 1458 683">The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.</td> <td data-bbox="1458 544 1852 683">Development of water reservoir of approximately 70 000m³.</td> </tr> <tr> <td data-bbox="568 683 777 821">Activity 25</td> <td data-bbox="777 683 1458 821">Listing Notice 1: The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.</td> <td data-bbox="1458 683 1852 821">The development of a waste acid neutralisation plant which will be used for treatment of liquid effluent from plant processes.</td> </tr> <tr> <td data-bbox="568 821 777 1002">Activity 2</td> <td data-bbox="777 821 1458 1002">Listing Notice 2: The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more.</td> <td data-bbox="1458 821 1852 1002">Installation of steam turbines for generation of electricity to be utilized for steam supply to the TiO₂ plant during Sulphuric acid plant shutdown periods which will produce a maximum of 24MW.</td> </tr> <tr> <td data-bbox="568 1002 777 1326">Activity 4</td> <td data-bbox="777 1002 1458 1326">Listing Notice 2: The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.</td> <td data-bbox="1458 1002 1852 1326"> Storage of the following on site: <ul style="list-style-type: none"> • Titanium tetrachloride (TiCl₄) • Titanium oxychloride (TiOCl₂) • Calcium hydroxide [Ca(OH)₂] • Sulfuric acid [H₂SO₄] (as 98 to 104%) • Diesel Combine storage of ~ 45 000m³ </td> </tr> <tr> <td data-bbox="568 1326 777 1431">Activity 6</td> <td data-bbox="777 1326 1458 1431">Listing Notice 2: The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended</td> <td data-bbox="1458 1326 1852 1431">The need to apply for an Atmospheric Emissions Licence for activities listed in the NEMAQA.</td> </tr> </tbody> </table>	Activity Number:	Relevant Activity (ies) as set out in Listing Notice 1, 2 & 3 (GN R327, GNR325 & GNR324)	Description of Activity as per the project description	Activity 13	The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	Development of water reservoir of approximately 70 000m ³ .	Activity 25	Listing Notice 1: The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.	The development of a waste acid neutralisation plant which will be used for treatment of liquid effluent from plant processes.	Activity 2	Listing Notice 2: The development and related operation of facilities or infrastructure for the generation of electricity from a non-renewable resource where the electricity output is 20 megawatts or more.	Installation of steam turbines for generation of electricity to be utilized for steam supply to the TiO ₂ plant during Sulphuric acid plant shutdown periods which will produce a maximum of 24MW.	Activity 4	Listing Notice 2: The development and related operation of facilities or infrastructure, for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of more than 500 cubic metres.	Storage of the following on site: <ul style="list-style-type: none"> • Titanium tetrachloride (TiCl₄) • Titanium oxychloride (TiOCl₂) • Calcium hydroxide [Ca(OH)₂] • Sulfuric acid [H₂SO₄] (as 98 to 104%) • Diesel Combine storage of ~ 45 000m ³	Activity 6	Listing Notice 2: The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended	The need to apply for an Atmospheric Emissions Licence for activities listed in the NEMAQA.	
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Activity 13	The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	Development of water reservoir of approximately 70 000m ³ .																		
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Legislation	Description and Relevance		Responsible Authority	
		<p>permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding-</p> <p>I. activities which are identified and included in Listing Notice 1 of 2014</p> <p>II. activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply; or</p> <p>III. the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 200m³ or less; or</p> <p>IV. where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.</p>	<p>The need to apply for a water use licence for activities outlined in NWA.</p>	
	<p>Activity 2</p>	<p>Listing Notice 3: The development of reservoirs, excluding dams, with a capacity of more than 250 cubic metres.</p> <p>KwaZulu-Natal</p> <p>i. Trans-frontier protected areas managed under international conventions;</p> <p>ii. Community Conservation Areas;</p> <p>iii. Biodiversity Stewardship Programme Biodiversity Agreement areas;</p> <p>iv. World Heritage Sites;</p> <p>v. In an estuarine functional zone;</p> <p>vi. In a protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>vii. Sites or areas identified in terms of an international convention;</p> <p>viii. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>ix. Core areas in biosphere reserves;</p> <p>x. Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose;</p> <p>xi. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p>	<p>Development of water reservoir of approximately 70 000m³ in a critical biodiversity area as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans</p>	

Legislation	Description and Relevance		Responsible Authority	
		<p>xii. Outside urban areas:</p> <p>(aa) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any terrestrial protected area identified in terms of NEMPAA or from the core area of a biosphere reserve; or</p> <p>(bb) Areas seawards of the development setback line or within 1 kilometre from the high-water mark of the sea if no such development setback line is determined; or</p> <p>xiii. Inside urban areas:</p> <p>(aa) Areas zoned for use as public open space;</p> <p>(bb) Areas seawards of the development setback line or within 100 metres from the high-water mark of the sea if no such development setback line is determined; or</p> <p>(cc) Within urban protected areas.</p>		
	Activity 14	<p>Listing Notice 3: The development of—</p> <p>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</p> <p>where such development occurs—</p> <p>(a) within a watercourse;</p> <p>KwaZulu-Natal</p> <p>vii. Critical biodiversity areas or ecological support areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p>	Development of infrastructure with a physical footprint of more than 10 m ² in a watercourse located in a critical biodiversity area	
<p>NEMA EIA Regulations 2014 (Government Notice (GN) 324, 325 and 327), as amended</p>	<p>The EIA Regulations (GNR 982) were promulgated in terms of Sections 24 of the NEMA, to manage the process, methodologies, and requirements for the undertaking of an EIA. The GNR 982 stipulates that the applicant for activities listed under GNR 983, 984, or 985, as amended in 2021 must appoint an independent EAP to manage the EIA process. Listed Activities are activities identified in terms of Section 24 of the NEMA which are likely to have a detrimental impact on the environment, and which may not commence without an EA from the Competent Authority (CA). EA required for Listed Activities is subject to the completion of either a Basic Assessment (BA) process or full Scoping and Environmental Impact Assessment (S&EIA) with applicable timeframes associated with each process. The EA must be obtained prior to the commencement of those listed activities.</p> <p><i>The project triggers activities listed in Listing Notices 1(GNR 983), 2 (NGR 984), and 3 (GNR 985), as amended in 2017 and 2021 and requires a full EIA (scoping and impact assessment).</i></p>			

Legislation	Description and Relevance	Responsible Authority
Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series, Guideline 5: Assessment of the EIA Regulations, 2012 (Government Gazette 805)	<i>Environmental impacts will be generated primarily in the construction phase of this project. These, together with associated operational and decommissioning phase impacts will be assessed during the impact assessment phase of the process.</i>	
Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004	<i>An Environmental Assessment is required for the proposed project as activities are triggered under GNR 325 and GN R327.</i>	
Review in Environmental Impact Assessment, Integrated Environmental Management, Information Series 13, Department of Environmental Affairs and Tourism (DEAT), Pretoria.		
DEA Integrated Environmental Management Guideline Series, Guideline 7: Public Participation in the Environmental Impact Assessment Process, 2012 (Government Gazette 807)	<i>Public participation is a requirement of the EIA Process and will be conducted for the proposed project as stipulated in Chapter 6 of the NEMA and will take into account various public participation guidelines as stipulated in Section 9.</i>	
National Water Act, 1998 (Act No. 36 of 1998) (NWA)	The NWA is the primary regulatory legislation controlling and managing the use of water resources as well as the pollution thereof. This act provides for fundamental reformation of legislation relating to water resource use. The preamble to the NWA recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure sustainability of the nation's water resources in the interests of all water users. The purpose of the Act is stated in Section 2 and enforced by the Department of Water and Sanitation (DWS).	Department of Water and Sanitation (DWS)

Legislation	Description and Relevance	Responsible Authority																		
	<p><i>The proposed project triggers Section 21 (a), (b), (c), (i), and (j) water uses and therefore requires a Water Use Licence (WUL) from the DWS. An application for a WUL will be submitted to the DWS.</i></p>																			
<p>National Environmental Management Waste Act (Act No. 59 of 2008) (NEM: WA)</p>	<p>The objectives of the National Environmental Management: Waste Act (NEM:WA) involve the protection of health, wellbeing and the environment by providing reasonable measures for the minimization of natural resource consumption, avoiding and minimizing the generation of waste, reducing, recycling and recovering waste, and treating and safely disposing of waste as a last resort. The Act involves the management of waste according to the waste management hierarchy. In terms of the NEM:WA, all waste management activities must be licenced. A distinction is made between Category A waste management activities, which require a basic assessment, Category B activities, which require a full EIA, and Category C waste management activities which do not require a waste management licence but compliance with relevant requirements or standards.</p> <p><i>The HSS to be used as one of the feedstocks into Nyanza’s metallurgical process was classified as hazardous waste. The pre-milled HSS will be transported from the Highveld Steel Site to Nyanza for use in the Rutile Pigment production process. Provision will be made for the on-site storage of HSS for 18 days’ worth of stock (2 200m³).</i></p> <p><i>The project triggers Activity 3, 4 and 10 under Category B and Activity 2 under Category C as listed in GNR921 of the NEM:WA, as amended in 2022 and will therefore require a Waste Management Licence (WML). Activity 2 triggered under Category does not require a WML and is therefore noted and will be complied with. The table below provides a summary of the NEM: WA listed activities that are applicable to the project.</i></p> <table border="1" data-bbox="568 935 1834 1414"> <thead> <tr> <th>Listed Activity</th> <th>Description</th> <th>Applicability to Project</th> </tr> </thead> <tbody> <tr> <td colspan="3">GNR 921 Category B</td> </tr> <tr> <td>Activity 3</td> <td>The recovery of waste including the refining, utilisation, or co-processing of the waste at a facility that processes in excess of 100 tons of general waste per day or excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.</td> <td>The metallurgical processing of recovering HSS which is classified as a hazardous waste.</td> </tr> <tr> <td>Activity 4</td> <td>The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage.</td> <td>The metallurgical processing of treating HSS which is classified as a hazardous waste.</td> </tr> <tr> <td>Activity 10</td> <td>The construction of a facility for a waste management activity listed in Category B</td> <td>Construction of the facility to store HSS which is classified as a hazardous waste.</td> </tr> <tr> <td colspan="3">GNR 921 Category C</td> </tr> </tbody> </table>	Listed Activity	Description	Applicability to Project	GNR 921 Category B			Activity 3	The recovery of waste including the refining, utilisation, or co-processing of the waste at a facility that processes in excess of 100 tons of general waste per day or excess of 1 ton of hazardous waste per day, excluding recovery that takes place as an integral part of an internal manufacturing process within the same premises.	The metallurgical processing of recovering HSS which is classified as a hazardous waste.	Activity 4	The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage.	The metallurgical processing of treating HSS which is classified as a hazardous waste.	Activity 10	The construction of a facility for a waste management activity listed in Category B	Construction of the facility to store HSS which is classified as a hazardous waste.	GNR 921 Category C			<p>KwaZulu-Natal EDTEA and DFFE</p>
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Legislation	Description and Relevance			Responsible Authority												
	Activity 2: (does not require a Waste Management License but will comply to GNR 921)	The storage of hazardous waste at a facility that has the capacity to store in excess of 80m ³ of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste.	The storage of HSS which is classified as a hazardous waste.													
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA) as well as Listed Activities and Associated Minimum Emission Standards identified in terms of Section 21 of NEM:AQA	<p>The NEM:AQA was implemented on 24 February 2005 and reforms the law regulating air quality in order to protect the environment. On 22 November 2013 the list of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including health, social conditions, economic conditions, ecological conditions or cultural heritage was published under GNR 893 in Governmental Gazette 37054, in terms of section 21(1)(b) of the NEM:AQA thereby repealing the previous list of activities which were promulgated on 31 March 2010.</p> <p>Section 32 relates to dust control, Section 34 relates to noise control, and Section 35 relates to the control of offensive odours.</p> <p><i>Listed activities in terms of NEM:AQA will be triggered as a result of the proposed project and includes Subcategory 1.2, 1.4, 4.1, 4.20, 5.6, 7.2, and 8.1. The project will therefore require an Air Emissions Licence (AEL) from the King Cetshwayo District Municipality. An Air Quality Impact Assessment will be undertaken by a specialist as part of the EIA and AEL application processes. The principles of the act, focusing on minimisation of pollutant emissions will be taken cognisance of in the development of the EMPr during the EIA. The table below provides a summary of the NEM: AQA activities applicable to the proposed project. These will however be finalised once air quality assessment has been undertaken.</i></p> <table border="1" data-bbox="568 951 1854 1425"> <thead> <tr> <th data-bbox="568 951 891 975">Listed Activity</th> <th data-bbox="891 951 1442 975">Description</th> <th data-bbox="1442 951 1854 975">Applicability to Project</th> </tr> </thead> <tbody> <tr> <td data-bbox="568 979 891 1139">Subcategory 1.2: Liquid Fuel Combustion Installations</td> <td data-bbox="891 979 1442 1139">Liquid fuels combustion installations used primarily for steam raising or electricity generation. All installations with design capacity equal to or greater than 50 MW heat input per unit, based on the lower calorific value of the fuel used.</td> <td data-bbox="1442 979 1854 1139">Heat input will be greater than 50MW when the turbines are driven by steam arising from the production of sulfuric acid.</td> </tr> <tr> <td data-bbox="568 1144 891 1310">Subcategory 1.4: Gas Combustion Installation</td> <td data-bbox="891 1144 1442 1310">Gas combustion (including gas turbines burning natural gas) used primarily for steam raising or electricity generation. All installations with design capacity equal to or greater than 50 MW heat input per unit, based on the lower calorific value of the fuel used.</td> <td data-bbox="1442 1144 1854 1310">Gas-fired boilers to supplement steam from the sulfuric acid plant.</td> </tr> <tr> <td data-bbox="568 1315 891 1425">Subcategory 4.1: Drying and Calcining</td> <td data-bbox="891 1315 1442 1425">Drying and calcining of mineral solids including ore. Facilities with capacity of more than 100 tons/month product.</td> <td data-bbox="1442 1315 1854 1425">Drying of a slurry via a gas- fired spin flash drier and Calcination to drive off water and acid to grow the TiO₂ crystals.</td> </tr> </tbody> </table>			Listed Activity	Description	Applicability to Project	Subcategory 1.2: Liquid Fuel Combustion Installations	Liquid fuels combustion installations used primarily for steam raising or electricity generation. All installations with design capacity equal to or greater than 50 MW heat input per unit, based on the lower calorific value of the fuel used.	Heat input will be greater than 50MW when the turbines are driven by steam arising from the production of sulfuric acid.	Subcategory 1.4: Gas Combustion Installation	Gas combustion (including gas turbines burning natural gas) used primarily for steam raising or electricity generation. All installations with design capacity equal to or greater than 50 MW heat input per unit, based on the lower calorific value of the fuel used.	Gas-fired boilers to supplement steam from the sulfuric acid plant.	Subcategory 4.1: Drying and Calcining	Drying and calcining of mineral solids including ore. Facilities with capacity of more than 100 tons/month product.	Drying of a slurry via a gas- fired spin flash drier and Calcination to drive off water and acid to grow the TiO ₂ crystals.	DFFE and King Cetshwayo District Municipality
Listed Activity	Description	Applicability to Project														
Subcategory 1.2: Liquid Fuel Combustion Installations	Liquid fuels combustion installations used primarily for steam raising or electricity generation. All installations with design capacity equal to or greater than 50 MW heat input per unit, based on the lower calorific value of the fuel used.	Heat input will be greater than 50MW when the turbines are driven by steam arising from the production of sulfuric acid.														
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Subcategory 4.1: Drying and Calcining	Drying and calcining of mineral solids including ore. Facilities with capacity of more than 100 tons/month product.	Drying of a slurry via a gas- fired spin flash drier and Calcination to drive off water and acid to grow the TiO ₂ crystals.														

Legislation	Description and Relevance	Responsible Authority														
	<table border="1"> <tr> <td data-bbox="562 266 891 357">Subcategory 4.20: Slag Processes</td> <td data-bbox="891 266 1440 357">The processing or recovery of metallurgical slag by the application of heat. All installations.</td> <td data-bbox="1440 266 1854 357">Richards Bay and HSS will be used in the process.</td> </tr> <tr> <td data-bbox="562 357 891 432">Subcategory 5.6: Lime Production</td> <td data-bbox="891 357 1440 432">Processing of lime, magnesite, dolomite and calcium sulfate. All installations.</td> <td data-bbox="1440 357 1854 432">Lime Slaker</td> </tr> <tr> <td data-bbox="562 432 891 799" rowspan="2">Subcategory 7.2: Production of Acids</td> <td data-bbox="891 432 1440 647">The production, bulk handling and or use in manufacturing of hydrofluoric, hydrochloric, nitric and sulfuric acid (including oleum) in concentration exceeding 10%. Processes in which oxides of sulfur are emitted through the production of acid sulfites of alkalis or alkaline earths or through the production of liquid sulfur or sulfurous acid.</td> <td data-bbox="1440 432 1854 647">The sulfuric acid plant will be sized to produce the total steam requirement for the TiO₂ plant, and the excess sulfuric acid produced will be sold in the local market.</td> </tr> <tr> <td data-bbox="891 647 1440 799">Secondary production of hydrochloric acid through regeneration. All installations producing, handling and or using more than 100 tons per annum of any of the listed compounds (Excluding metallurgical processes related activities regulated under category 4).</td> <td data-bbox="1440 647 1854 799"></td> </tr> <tr> <td data-bbox="562 799 891 911">Subcategory 8.1: Thermal Treatment of General and Hazardous Waste</td> <td data-bbox="891 799 1440 911">Facilities where general and hazardous waste are treated by the application of heat. All installations treating 10kg per day of waste.</td> <td data-bbox="1440 799 1854 911">HSS, which is classified as a hazardous waste, will be used on site.</td> </tr> </table>	Subcategory 4.20: Slag Processes	The processing or recovery of metallurgical slag by the application of heat. All installations.	Richards Bay and HSS will be used in the process.	Subcategory 5.6: Lime Production	Processing of lime, magnesite, dolomite and calcium sulfate. All installations.	Lime Slaker	Subcategory 7.2: Production of Acids	The production, bulk handling and or use in manufacturing of hydrofluoric, hydrochloric, nitric and sulfuric acid (including oleum) in concentration exceeding 10%. Processes in which oxides of sulfur are emitted through the production of acid sulfites of alkalis or alkaline earths or through the production of liquid sulfur or sulfurous acid.	The sulfuric acid plant will be sized to produce the total steam requirement for the TiO ₂ plant, and the excess sulfuric acid produced will be sold in the local market.	Secondary production of hydrochloric acid through regeneration. All installations producing, handling and or using more than 100 tons per annum of any of the listed compounds (Excluding metallurgical processes related activities regulated under category 4).		Subcategory 8.1: Thermal Treatment of General and Hazardous Waste	Facilities where general and hazardous waste are treated by the application of heat. All installations treating 10kg per day of waste.	HSS, which is classified as a hazardous waste, will be used on site.	
Subcategory 4.20: Slag Processes	The processing or recovery of metallurgical slag by the application of heat. All installations.	Richards Bay and HSS will be used in the process.														
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	Secondary production of hydrochloric acid through regeneration. All installations producing, handling and or using more than 100 tons per annum of any of the listed compounds (Excluding metallurgical processes related activities regulated under category 4).															
Subcategory 8.1: Thermal Treatment of General and Hazardous Waste	Facilities where general and hazardous waste are treated by the application of heat. All installations treating 10kg per day of waste.	HSS, which is classified as a hazardous waste, will be used on site.														
National Forestry Act, 1998 (Act No. 84 of 1998) (NFA)	<p>The NFA protects against the cutting, disturbance, damage, destruction or removal of protected trees.</p> <p><i>The proposed project will include the clearance of vegetation and trees from the project footprint. A biodiversity assessment will be conducted as part of the EIA. The clearance of vegetation will still result in loss of biodiversity and the EIA will include mitigation measures that will be required to minimise impacts on flora.</i></p>	Ezemvelo KZN Wildlife (EKZNW) and the DFFE														
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993)	<p>For the generation of noise during construction and operations.</p> <p><i>Any occupational health and safety aspects and issues will be addressed in the EIA and will be taken cognisance of in the EMPr development.</i></p> <p><i>In addition, an MHI assessment will be undertaken.</i></p>	DFFE														
National Noise Control Regulations in terms of Section	For the generation of noise during construction and operations.	King Cetshwayo District Municipality														

Legislation	Description and Relevance	Responsible Authority
25 of the ECA (1992), revised 14 January 1994	<i>A number of noise generating activities are associated with the proposed project. A Noise Impact Assessment will be undertaken by a specialist during the impact assessment phase. Any noise control aspects and issues will be addressed in the EIA and will be taken cognisance of in the EMP development.</i>	
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA)	<p>The National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA) provides for the management and conservation of South Africa's biodiversity within the framework of NEMA, as well as the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources. The Act provides for listing of threatened or protected ecosystems, in one of four categories: critically endangered, endangered, vulnerable, or protected. In line with the Convention on Biological Diversity, the NEM:BA aims to legally provide for biodiversity conservation, sustainable use and equitable access and benefit sharing. The NEM:BA established the South African National Biodiversity Institute (SANBI). The NEM:BA creates a basic legal framework for the formation of a national biodiversity strategy and action plan and the identification of biodiversity hotspots and bioregions, which will then be given legal recognition. It imposes obligations on landowners (state or private) governing alien invasive species as well as regulates the introduction of genetically modified organisms. Furthermore, the NEM:BA serves to regulate bioprospecting, making provision for communities to share the profits of any exploitation of natural materials involving indigenous knowledge.</p> <p><i>The management and control of alien invasive species on the impacted areas during all the phases of the project will be governed by the NEM:BA. The NEM:BA ensures that provision is made by the site developer to remove any alien species, which have been introduced to the site or are present on the site. A biodiversity impact assessment will be undertaken by a specialist and will include the identification of alien invasive plant species that are located on the proposed project site. The specialist will identify and recommend mitigation measures that Nyanza will be required to implement to manage and control alien invasive plant species located on the project site.</i></p> <p><i>In addition, the specialist will also identify any protected species that may be affected by the proposed project. Where required, Nyanza will apply for permits for the relocation of protected species.</i></p>	DFFE, KwaZulu-Natal EDTEA, and Ezemvelo KZN Wildlife (EKZNW)
KwaZulu-Natal Nature Conservation Management Act, 1997 (Act 9 of 1997) (KZNNCMA)	This Act makes provision for the protection of the natural environment of the KwaZulu-Natal province. It establishes the KwaZulu-Natal Nature Conservation Board and the KwaZulu-Natal Nature Conservation Service and grants powers to the Minister to establish a local board in respect of one or more protected areas. The Minister, being a member of the Kwazulu Natal Executive Council, shall be responsible for nature conservation policy and the implementation of provisions of this Act. He or she may, in consultation with the Board, proclaim an area to be a protected area. The Board shall, among other things, direct management nature conservation and protected areas in the province, develop and promote ecotourism in protected areas and ensure the efficient management of the Conservation Service. The Conservation Service shall, among other things, provide support to the Board and local boards in management of nature conservation and protected areas.	KZN EDTEA, DFFE, Ezemvelo

Legislation	Description and Relevance	Responsible Authority
	<p><i>The Biodiversity Assessment study take cognusance of the requirements of the Act and will include mitigation measures tht will be aimed at protecting the natural environment affected by the project.</i></p>	
<p>Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA)</p>	<p>The CARA aims to provide for control over the utilisation of natural agricultural resources in order to promote the conservation of soil, water resources and vegetation and to combat weeds and invader plants. The Act makes provision for control measures to be applied in order to achieve the objectives of the Act, these measures relate to inter alia:</p> <ul style="list-style-type: none"> • Cultivation of virgin soil; • Utilisation/protection of wetlands, marshes, water sponges, water courses/sources; • The regulating of the flow pattern of run-off water; • The utilisation and protection of vegetation; • The grazing capacity of veld and the number and type of animals; • The control of weeds and invader plants; and <p>The restoration or reclamation of eroded land or land, which is disturbed or denuded.</p> <p><i>Any alien invasive plant species located on the proposed project site will be identified during the biodiversity assessment. The assessment will include measures required for the control and management of the alien invasive species that will be included in the project EMPr.</i></p>	<p>DFFE and the Department of Agriculture, Land Reform and Rural Development (DALRRD)</p>
<p>National Heritage Resources Act, 1999(Act No 25 of 1999) (NHRA)</p>	<p>Heritage Permit for structures 60 years or older. Any person who intends to undertake any of these developments, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the Project. If the Heritage Impact Assessment (HIA) indicates that the development will have an impact on a heritage resource listed within sections 38 of the Act must be followed. The enforcing authority for this act is the South African National Heritage Resources Agency (SAHRA). In terms of Section 34, 35, 36, 37, and 38 of the NHRA, initiating a development must at the very earliest stages of development notify the responsible heritage resources authority and furnish it with details regarding the location, nature, and extent of the project. In addition, Section 23(2)(b) of the NEMA requires that cultural heritage resources be assessed as part of the impact assessment process and thus in turn is subject to the EIA Regulations.</p> <p><i>A Heritage Impact Assessment (HIA) was undertaken as part of the RBIDZ Phase 1F EIA. The assessment found that there are no heritage resources located on the Phase 1F properties. A site-specific phase 1 HIA will be undertaken as part</i></p>	<p>South African Heritage Resource Agency (SAHRA)</p>

Legislation	Description and Relevance	Responsible Authority
	<i>of the EIA for the project. The specialist will identify mitigation measures that must be implemented should by chance graves and heritage resources be affected by the project.</i>	
Restitution of Land Rights Act, 1994 (Act No. 22 of 1994), as amended in 2014.	This Act deals specifically with land claims. <i>The proposed plant location is owned by the RBIDZ.</i>	Department of Agriculture, Land Reform and Rural Development (DALRRD)

7.2 IFC Performance Standards

The IFC's Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy.

The Performance Standards are directed towards Nyanza's, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities.

The IFC's Environmental and Social Performance Standards define Nyanza's responsibilities for managing their environmental and social risks.

International Finance Corporation

International Finance Corporation (IFC) is the private sector arm of the World Bank Group. Summarily, it aims at fighting poverty with passion and professionalism for lasting results and to help people help themselves and their environment by providing resources, sharing knowledge, building capacity, and forging partnerships in the public and private sectors.

IFC's Policy on Environmental and Social Sustainability, Effective January 1, 2012 supersedes the IFC Disclosure of Information Policy (April 2006) in its entirety. This Policy is not an express or implied waiver of IFC's privileges and immunities under its Articles of Agreement, international conventions, or any applicable law, nor does it provide any contractual or other rights to any party.

At IFC while transparency and accountability are fundamental to fulfilling its development mandate, IFC encourages its clients to be more transparent about their businesses and believes that when clients are committed to transparency and accountability, they help promote the long-term profitability of their investments.

IFC strives for positive development outcomes in the activities it supports in developing countries including: (i) investments financed directly by IFC; (ii) investments implemented through financial intermediaries (FIs) or managed by IFC's Asset Management Company or any other IFC subsidiary, as well as investments funded in part or in whole by donors; and (iii) advisory services.

IFC believes that an important component of achieving positive development outcomes is the environmental and social sustainability of these activities, which IFC pursues and expects to achieve through the application of this Policy on Environmental and Social Sustainability (the Sustainability Policy or the Policy), and a comprehensive set of environmental and social Performance Standards. Through this Policy, IFC puts into practice its commitments to environmental and social sustainability. Activities supported and financed by IFC include a wide range of investment and advisory products including technical, financial and/or regulatory advice, project structuring as well as training to companies, industries, and governments.

Within the scope of an agreed advisory activity, all advice and training will be consistent with the Performance Standards. The Performance Standards on Environmental and Social Sustainability consist of the followings:

Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts;

Performance Standard 2: Labour and Working Conditions;

Performance Standard 3: Resource Efficiency and Pollution Prevention;

Performance Standard 4: Community Health, Safety, and Security;

Performance Standard 5: Land Acquisition and Involuntary Resettlement;

Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;

Performance Standard 7: Indigenous Peoples; and

Performance Standard 8: Cultural Heritage.

These Performance Standards help IFC investment and advisory clients manage and improve their environmental and social performance through a risk and outcomes-based approach. While managing environmental and social risks and impacts in a manner consistent with the Performance Standards is the responsibility of the client, IFC seeks to ensure, through its due diligence, monitoring, and supervision efforts, that the business activities it finances are implemented in accordance with the requirements of the Performance Standards. As a result, the outcome of IFC's environmental and social due diligence of a proposed business activity is an important factor in its approval process and will determine the scope of the environmental and social conditions of IFC financing.

IFC's development mission are its efforts to carry out investment and advisory activities with the intent to "do no harm" to people and the environment, to enhance the sustainability of private sector operations and the markets they work in, and to achieve positive development outcomes. IFC is committed to ensuring that the costs of economic development do not fall disproportionately on those who are poor or vulnerable, that the environment is not degraded in the process, and that renewable natural resources are managed sustainably.

IFC recognizes that climate change is a serious global challenge and that climate-related impacts may impede economic and social well-being and development efforts. Working with the private sector and other parties to address climate change is therefore a strategic priority for IFC. IFC will engage in innovative investments and advisory services to support climate-friendly solutions and opportunities for business.

Table 7-2 provides a summary of Nyanza's policy approaches in complying with the IFC Performance Standards and how the IFC PS will be addressed during the EIA for the proposed project. The IFC's ESIA requirements will also be addressed during the impact assessment phase of the process.

Table 7-2: Nyanza’s policy approaches in complying with the IFC Performance Standards

IFC PS	Performance Standard	PS Requirements	Applicable (YN)	How the PS will be addressed
1	Assessment & Management of Environmental and Social Risks & Impacts	a) Environmental Policy b) Procedure outlining how E&S risks and impacts will be identified c) Management Programs (EMP) d) Organizational Capacity & Competence e) Emergency Preparedness & Response (Plan, consultation, resources, Plan review staff training) f) Monitoring & Review (E&S performance information reports, g) Stakeholder Engagement (Community Engagement process, disclosure of assessment information, Prior & Informed Consultation of affected Communities) h) External Communication and Grievance Mechanism (Mechanism to receive comms & grievances from the public, Queries register)	Y	<p>Nyanza is in the process of developing its Environmental Policy. Qualified designated staff have been directed to deal with Environmental and Social Risks as part of their function. An Emergency Preparedness Response Plan will be developed and maintained. A robust Stakeholder Engagement and External communications procedure will be developed in addition, to a grievance mechanism.</p> <p>The identification of risks and impacts will include:</p> <ul style="list-style-type: none"> Stakeholder engagement with I&APs. The purpose of the stakeholder engagement will be to provide stakeholders with the description of the proposed project and provide them with an opportunity to provide information on how the proposed project is likely to impact on them. This will be considered during the impact assessment phase of the project. Identification of potential risks and impacts: High level potential risk and impacts have been identified, based on the environment and project processes. Specialist will be required to refine the identified impacts and assess the significance of the risks and impacts on the environment. Specialist Studies: Specialists have been appointed to define the baseline receiving environment and identify and assess the potential risks and impact associated with the proposed project in their areas of expertise. A preliminary environmental baseline characterisation and high-level impact assessment has been undertaken as part of the scoping phase of the process. The specialist studies identified are included in Section 10.8 of this report. Mitigation: Specialists and the EIA team will identify mitigation measures that Nyanza will be required to implement to minimise the significance of the identified potential impacts on the environment. The mitigation measures will be included in the different management plans that will be included in the project EMPr. <p>In addition, it is expected that Nyanza (through the IDZ) will have continual discussions on environmental issues associated with the project with the communities through the Environmental Review Committee (ERC).</p>

IFC PS	Performance Standard	PS Requirements	Applicable (YN)	How the PS will be addressed
2.	Labour & Working Conditions	a) Human Resource Policies & procedures, Working conditions,	Y	Nyanza already has HR policies in place with detailed description of working conditions
		b) Worker Organisations		Nyanza has a policy to respect the right to form and belong to worker organisations
		c) Non-discrimination & Equal Opportunity		Nyanza has a policy of non-discrimination and equal opportunities
		d) Retrenchment		There is no plan to retrench people
		e) Grievance mechanism		Nyanza has a grievance mechanism for workers
		f) Protecting the workforce (Child Labour, Forced Labour)		Nyanza has a policy to ensure that no child or forced labour will be used in its operations. This also applies to contractors.
		g) Occupational Health & Safety		In addition to complying with local Occupational Health and Safety legislation, the EHS guidelines will be incorporated into Nyanza's OHS protocols.
		h) Workers engaged by Third Parties		Nyanza has a policy to ensure that no child or forced labour will be used in its operations. This also applies to contractors.
		i) Supply Chain		A robust assessment of the Nyanza supply chain will be made
3.	Resource Efficiency & Pollution Prevention	<p>a) General Env, Health & safety Guidelines (Pollution prevention & control and waste management techniques, compare water & Air emissions against EHS Guideline, Impacts to ambient conditions)</p> <p>b) Resource Efficiency (resource conservation and energy efficiency measures incorporated into the design and operations)</p> <p>c) Green House Gases (GHG quantification)</p>	Y	<p>The EIA will include an assessment of the risk of pollution and will include mitigation measures that will be aimed at minimisation pollution. The requirements of PS 3 on pollution management will also be addressed in the emergency preparedness and response plan and the management plans that will be compiled by specialists as part of the EIA.</p> <p>The specialist studies to be undertaken will include an Air Quality Impact Assessment, where GHGs and other air emissions that may</p>

IFC PS	Performance Standard	PS Requirements	Applicable (YN)	How the PS will be addressed
		d) Options for GHG emission reductions e) Water consumption (Significant consumer of water?, Measures to reduce water usage f) Pollution Prevention (Demonstrate Avoidance or minimization of pollutants/emissions; Degraded airshed?) g) Waste (Demonstrate measure to Avoid, reduce, recover and re-use waste. Environmentally sound disposal of hazardous and non-hazardous waste, Use of legitimate and reputable contractors, chain of custody documentation to final destination, h) Haz Materials management (Hazardous Materials Management including wastes/inputs during production, handling, storage and use, any banned or phased out substances or chemicals? i) Pesticide Use and Management (Will pesticides be used?)		result from the proposed project will be quantified and their potential impacts assessed. An air quality management and monitoring plan will be compiled and incorporated into the project EMPr that will be implemented by Nyanza. <ul style="list-style-type: none"> • Water requirements have been quantified and a Hydrologist has been appointed who will undertake an assessment of the impacts of Nyanza’s water use on the catchment. The hydrologist will compile a stormwater management plan to prevent pollution of water resources from storm water. A water management and monitoring plan will be incorporated into the project EMPr for implementation. • The EIA process with assistance from the Process Engineers will identify the waste streams and quantify of waste to be produced over the project life cycle. Furthermore the waste management plan which will be developed to manage all waste in a responsible manner will be incorporated into the EMPr for implementation. • Complying with the mitigation measures in the EMPr and relevant management plans will ensure that negative environmental impact are avoided and/or reduced and the positive impacts are enhanced. • The proposed project will not make use of pesticides.
4.	Community Health, Safety & Security		Y	Impacts and risks to the health and safety of affected communities during the project life cycle will be assessed. The EHS guidelines will be incorporated into preventive and control measures. <p>The EIA will include an assessment of the potential health and safety impacts that may occur resulting from the project. The EMPr to be compiled during the impact assessment phase will include health and safety training requirements for contractors and workers. An emergency preparedness and response plan dealing with health and safety risks will be compiled and included in the EMPr for the project.</p>

IFC PS	Performance Standard	PS Requirements	Applicable (YN)	How the PS will be addressed
5.	Land Acquisition and Involuntary Resettlement		N	Nyanza is a tenant with a lease in the RBIDZ and therefore it is not acquiring any land. This project will not result in any resettlement.
6.	Biodiversity Conservation and Sustainable Management of Living Natural Resources		Y	A Biodiversity assessment study which will look at impacts on biodiversity and ecosystem services is underway for the project area and it is in the process of being finalized. Outcomes of this study will be considered.
7.	Indigenous Peoples		N	There are no Indigenous Peoples that will be affected by the project
8.	Cultural Heritage		Y	A Heritage Impact assessment has already been conducted for the project and it is in the process of being finalized. Outcomes of this study will be considered.

7.3 Provincial and Municipal Bylaws

The King Cetshwayo District Municipality, City of uMhlathuze Local Municipality, and the KwaZulu-Natal Province have developed local bylaws and various policies relating to waste disposal, water, economic development, air quality, etc. The proposed project must ensure that such policies and bylaws are adhered to as far as possible during the construction and operation of the 80 000 tpa Titanium Dioxide (TiO₂) pigment plant.

7.4 Guidelines

The following documents will be taken into account during the impact assessment process and compilation of the EMP of the proposed project:

- KwaZulu-Natal Provincial Biodiversity Management Plan;
- City of uMhlathuze Local Municipality Final Integrated Development Plan (IDP) Review (2021/2022);
- Richard's Bay Environmental Management Framework (EMF);
- DEA. 2012. Companion to the EIA Regulations 2010, Integrated Environmental Management Guideline Series 5, Department of Environmental Affairs;
- DEA. 2012. Companion to the EIA Regulations 2010, Integrated Environmental Management Guideline Series 7, Department of Environmental Affairs;
- DEA. 2004. Companion to the EIA Regulations 2010, Integrated Environmental Assessment Guideline Series 11, Department of Environmental Affairs; and
- DEAT. 2012. Companion to the EIA Regulations 2010, Review in Environmental Impact Assessment, Integrated Environmental management Information Series 13, Department of Environmental Affairs and Tourism.

8 Stakeholder Engagement Process

The public participation and stakeholder engagement process forms an important part of the scoping phase of the project. The public participation and stakeholder engagement process is primarily aimed at affording I&APs the opportunity to gain an understanding of the proposed project. In addition, the purpose of consultation with the landowners, key stakeholders, and I&APs is to provide them with the necessary information about the proposed project so that they can make informed decisions as to whether the project will affect them and provide the EIA team with local knowledge of the area and raise concerns relating to the biophysical, socio-economic, and cultural impacts that may arise.

The stakeholder engagement process will be conducted in terms of NEMA, which provides clear guidelines for stakeholder engagement during an EIA as summarised in Table 8-1. Figure 8-1 provides a diagram of an Integrated Stakeholder Engagement Process for the proposed project.

Table 8-1: NEMA Stakeholder Guidelines

NEMA Section	Applicability to Stakeholder Engagement
Chapter 1	Outlines the principles of environmental management, several pertaining to public consultation (e.g., Chapter 1, subsections (2), (3), (4) (f), (g), (h), (k), (q), and (r).
Chapter 6	Regulations 39 – 44 of the amended EIA Regulations GNR 326, promulgated on 8 December 2014, amended on 7 April 2017 and 11 June 2021, specify the minimum requirements for stakeholder engagement in an EIA process conducted under the NEMA.
Section 24J of the NEMA	In 2017, the Minister of Environmental Affairs published, Section 24J of the NEMA in terms of, Public Participation Guidelines which guide the Public Participation Process in order to give effect to Section (2)(4)(f), (o), and 24 (1A)(C) of the NEMA.

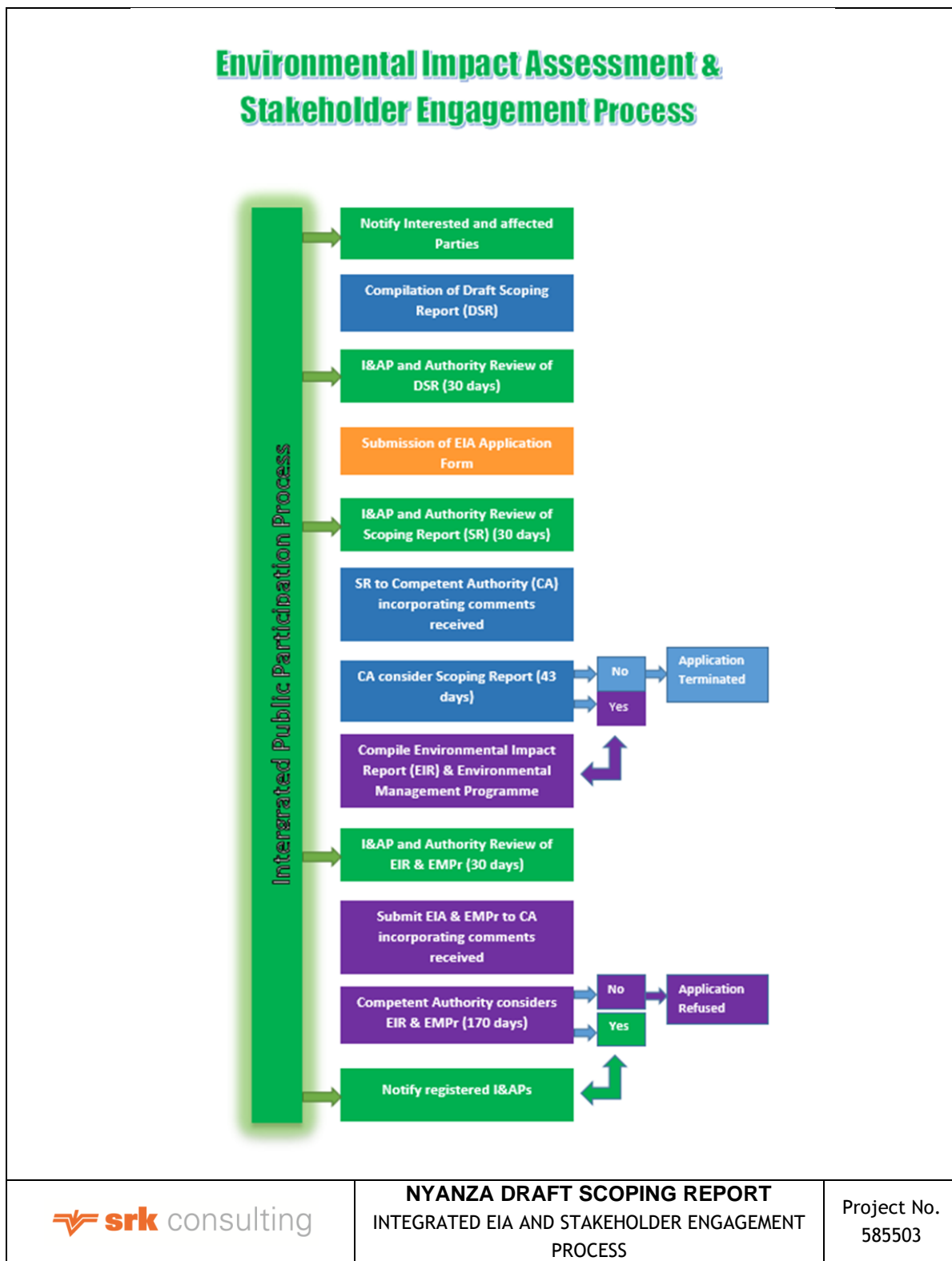


Figure 8-1: Integrated EIA and stakeholder engagement process

All the above guidelines have been incorporated into this stakeholder engagement process. The KZN EDTEA was identified as the competent authority for the EA application and the DFFE as the competent authority for the WML. Identified commenting authorities on this application include:

- DWS – KZN Regional Office;
- SAHRA – KZN Provincial Department;
- Department of Agriculture, Forestry and Fisheries

- City of uMhlatuze Local Municipality; and
- King Cetshwayo District Municipality;

8.1 Authority Pre-Application Consultation

Pre-application consultation meetings were held with the KZN EDTEA on 2 February 2022 and DFFE on 21 February 2022 respectively. Authority consultation documents are attached in Appendix D 1. The purpose of the meetings was to:

- Notify the KZN EDTEA and DFFE of the project and application;
- To discuss and confirm the applicable activities which will be triggered as a result of the development of the project;
- To discuss the stakeholder engagement process to be followed; and
- To discuss any other KZN EDTEA and DFFE requirements.

A meeting will be held with the King Cetshwayo District Municipality to discuss the AEL application process once the EIA process has been concluded.

8.2 Stakeholder Identification and Database Development

The database for Interested and Affected Parties (I&APs) was developed based on an existing database from the PTDC EIA process. This together with the use of GIS and the surveyor general website was used to verify the I&APs for the current EIA process. The I&AP database will be updated as an ongoing process from responses from the newspaper advertisements, on-site notices that were placed around the project area and the notification letters and registration forms sent to potential I&APs.

A copy of the database is provided in Appendix D 2.

8.3 Project Announcement

Stakeholders were provided with the opportunity to participate and register as I&APs during the announcement phase of the project. SRK made use of various methods to inform stakeholder of Nyanza's intention to undertake the required and environmental processes and EA application including newspaper advertisements, onsite notices, SMS and notification letters.

8.3.1 Distribution of Notification Letters and Background Information Document

Notification letters were sent to identified I&APs on 20 April 2022, informing them of the proposed project. A copy of the notification letter and BID is attached as Appendix D 3.

The notification letter provided further information on the project, the environmental processes required for the project and a summary of the stakeholder engagement process to be followed.

8.3.2 Site Notice Placements

Site notices of A2 size were placed on the road leading to the RBIDZ and entrance gates on 7 April 2022. The site notices were written in English (5) and Zulu (5). Table 8-2 provides the coordinates of each site notice. Photos of the two site notices are provided in

Table 8-3. A copy of the site notices is attached in Appendix D 4.

Table 8-2: Site notice placement

Site Notice Locations		Coordinates	
		Latitude	Longitude
1	RBIDZ Site entrance	28°44'35.80"S	32°2'3.75"E
2	Product Testing and Development Facility entrance	28°44'30.09"S	32°1'52.10"E

Table 8-3: Photos of site notices

Site Notice No	Photos of Site Notices
1	
2	

8.3.3 Newspaper Advertisements

English and IsiZulu newspaper advertisements notifying stakeholders about Nyanza's intention to apply for and EA, WML, WUL, and AEL were placed on 22 April 2022. The advertisements notified

the public of the application and the opportunity to participate in the EIA process. The details of the newspapers are provided in Table 8-4 and a copy of the advertisements can be found in Appendix D 5.

Table 8-4: Newspaper advertisements

Newspaper	Languages	Date
Zulu Observer	English and Zulu	22 April 2022

8.4 Public Review of the Draft Scoping Report

The Scoping Report was compiled in terms of GNR 982. All comments received thus far have been incorporated into the Scoping Report. The Scoping Report will be made available for a 30-day commenting period from 13 July 2022 to 12 August 2022. The availability of the Scoping Report was announced by means of letters and emails to registered I&APs.

Copies of the Draft Scoping Report were placed at the following venues provided in Table 8-5.

Table 8-5: List of places the Scoping Report will be places for public review

Public Place	Locality	Telephone
Richards Bay Public Library	Richards Bay Central, Richards Bay, 3900	035 907 5840
SRK Website	www.srk.co.za	(012) 361 9821

The Draft Scoping Report will also be made available to the competent and commenting authorities during the stakeholder engagement process.

8.5 Presentations to the Environmental Review Committee

The EAP will also make progress presentations to the Environmental Review Committee (ERC) on a quarterly basis. The ERC consists of the KZN EDTEA (environmental representatives- local office and Provincial); KZN Ezemvelo wildlife, RBIDZ (Chair), City of uMhlathuze representatives (Spatial planning as well as Environmental unit) and KZN Clean Air Association. Presentations to the ERC will be done on a quarterly basis until the EIA process is finalised. Recommendations from the meetings will be incorporated into the scoping report and EIR and EMPr that will be compiled during the impact assessment phase of the process.

8.6 Key Comments Received

The I&APs were notified of the proposed project and application process and invited to provide comments during the pre-application public participation phase. Comments received to date from the I&APs and responses provided by the EAP team are summarised in key comments received table as provided in Table 8-6.

Table 8-6: Key comments received

Comment Date	Comment raised by	Comment	SRK Response
16 May 2022	ERC/EDTEA	Some members of the ERC expressed concern with respect to the use of internal SRK specialists. A DFFE IQ was provided to SRK and the EDTEA requested that SRK provide a response to the IQ.	SRK submitted a response to the EDTEA stating that the matter the IQ was based on was not applicable to the use of internal specialists but the use of the same engineering company as EAPS. SRK has not been appointed for the Engineering inputs of the project, Hatch is undertaking the Engineering work.
26 May 2022	RBCAA	Same comment on the use of internal specialists was raised during the meeting with the RBCAA.	<p>According to the NEMA regulations:</p> <p><i>13. (1) An EAP and a specialist, appointed in terms of regulation 12(1) or 12(2), must-</i></p> <p><i>(a) be independent;</i></p> <p>Where:</p> <p><i>"independent", in relation to an EAP, a specialist or the person responsible for the preparation of an environmental audit report, means-</i></p> <p><i>(a) that such EAP, specialist or person has no business, financial, personal or other interest in the activity or application in respect of which that EAP, specialist or person is appointed in terms of these Regulations;</i></p> <p><i>or</i></p> <p><i>(b) that there are no circumstances that may compromise the objectivity of that EAP, specialist or person in performing such work;</i></p> <p>excluding -</p> <p><i>(i) normal remuneration for a specialist permanently employed by the EAP; or</i></p> <p><i>(ii) fair remuneration for work performed in connection with that activity, application or environmental audit;</i></p> <p>SRK is of the understanding of the concerns raised by the ERC are in connection with the independence between the EAP and the specialist.</p>

Comment Date	Comment raised by	Comment	SRK Response
			According to SRK's understanding of the requirements of Regulation 13 of NEMA, the EAP and specialist must be independent of the applicant to ensure a fair and accurate assessment of impacts. As such, if one is to accept that SRK as an EAP is independent of Nyanza as the applicant, then it stands to reason that SRK as a specialist is also independent of Nyanza as defined above. In fact in the definition exclusions, the NEMA regulations contemplate the situation where a specialist may be permanently employed by an EAP (Exclusion (1) above, emphasis by SRK).
16 May 2022	RBCAA	The RBCAA requested a meeting with the Air Quality Specialist to discuss the proposed Scope of Works for the study	A meeting was organised and held on 26 May 2021. Minutes of the meeting are included in Appendix D 7.

Verbatim stakeholder communications and commenting authority correspondence will be included in Appendix D 7 and Appendix D 8 respectively.

8.7 Comments and Response Report (CRR)

All issues and concerns raised by I&APs during the Scoping and EIA process, will be recorded, and responded to in the Comments and Responses Report (CRR) which will form part of the Final Scoping Report. A copy of the CRR is included as Appendix D 6.

9 Need and Desirability of the Proposed Project

9.1 Socio-economic Impact of the proposed project

More than 90% of the rutile and ilmenite TiO_2 feedstock are used for the manufacturing of TiO_2 pigments that are used in industrial paints, coatings, paper, cosmetics, plastics, etc. Currently, Africa imports 130 000 tonnes of TiO_2 pigment per year, while South Africa consumes about 35 000 tonnes (Global Africa Network, 2017). Nyanza will contribute 80 000 tonnes of TiO_2 pigment per annum. The largest quantity will be sold locally, while the remainder will be exported to other countries in Africa and the Middle East.

A technology partnership between Avertana of New Zealand and Nyanza will result in the construction of the 80 000 tpa TiO_2 Pigment Plant in Richards Bay. TiO_2 will be produced from stockpiled waste steel slag to create the pigment. This is the white pigment use most widely across the world (Global Africa Network, 2017).

The 80 000 tpa TiO_2 Pigment Plant will be situated within the Richards Bay Industrial Development Zone (RBIDZ) Phase 1F. Zoning for the RBIDZ is classified as general industrial and the project is in line with the mandate of the RBIDZ to be a purpose-built and secure industrial estate developed specifically to manufacture goods and to produce services to enhance beneficiation, investments, economic growth, job creation, and developing skills (ZO, 2021). This project will bring new technology to South Africa as well, aid the industrialisation programme of the government, and add value to mineral and mining processing value chain of the country (Global Africa Network, 2017).

Construction of the 80 000 tpa TiO_2 Pigment Plant strengthened the purpose to rebuild the economy of KwaZulu-Natal (KZN) after the Covid-19 outbreak caused delays. The destruction of the economy was left in the pandemic's track, resulting in thousands of job losses and companies closing down. Following its mandate, the economic recovery initiatives from the government and with the leadership of Member of Executive Council (MEC) Pillay, the RBIDZ is now required to speed up energies reserved to create job opportunities for people in the KZN province (ZO, 2021).

Commencing with the construction of investment projects and the persistent partnership between Nyanza and the RBIDZ, will contribute to stimulating and restoring the KZN economy. Local and provincial government parties along with Nyanza and the RBIDZ are pleased by this momentous project which will enhance the position of Richards Bay as the African Continent's Titanium and Minerals Beneficiation Capital (ZO, 2021).

It is expected that the project will lead to the creation of about 1 200 jobs during its construction phase and 550 jobs during its operational phase. Approximately 680 of these jobs will be for skilled labourers, while 1 070 of these jobs will be for unskilled labourers. People from the Richards Bay area will be preferably employed as this will be the most economically viable option. Should the project not proceed, a large negative socio-economic loss will be a consequence for the region.

9.2 Environmental responsibility

The environmental right is contained in the Constitution of the Republic of South Africa, Act 108 of 1996 (hereafter referred to as "The Constitution") Section 24 of the Constitution enshrines environmental rights in South Africa, which are interpreted to have a two-fold purpose. The first part guarantees a healthy environment to every person. The second part mandates the State to ensure compliance with the first part. The State is prohibited from infringing on the right to environmental protection and is further required to provide protection against any harmful conduct towards the environment.

It is expected that the proposed project will have negative environmental impacts. The impacts will be investigated in detail during the impact assessment phase of the project. Measures to mitigate the impacts of the project will also be identified and investigated during the impact assessment phase of the project. The mitigation measures will include designs and management practices that will be embarked on, to prevent and/or minimise the identified impacts on the social, cultural and environmental aspects. These mitigation measures will be described in more detail in the EMPr that Nyanza will be required to comply with throughout the life of the project.

The EMPr will also include environmental monitoring programme that will allow Nyanza to keep track of the impacts of the project on the environment and where required, to take remedial action. A stormwater management plan will be developed for the project to ensure that clean and dirty water are separated and to minimise the uptake of water for project activities by reusing water where possible.

9.3 Needs and Desirability as per Government Regulation Notice 792 of 2012

DEA (2017), Guideline on Need and Desirability, says that when evaluating project specific applications, the strategic context of such applications and the broader societal needs and the public interest should be considered. The contents of Municipal Integrated Development Plans (IDP), Strategic Development Frameworks (SDF), Environmental Management Frameworks (EMF) and other relevant plans frameworks and strategies must be taken into account. Whether a proposed activity will be in line with or deviate from the plan, framework or strategy per se is not the issue, but rather the ecological, social and economic impacts that will result because of the alignment or deviation". Where an application deviates from a plan, framework or strategy the EIA must show why the deviation might be justifiable.

Considering the merits of a specific application in terms of the need and desirability consideration, it must be decided which alternative represents "the most practicable environmental option", which in terms of the definition in NEMA and the purpose of the EIA Regulations are "*that option that provides the most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society, in the long-term as well as the short-term.*" This is the ultimate goal of the EIA process, and will only be fully addressed after the specialist studies have been undertaken and EIA Report and EMPr have been compiled.

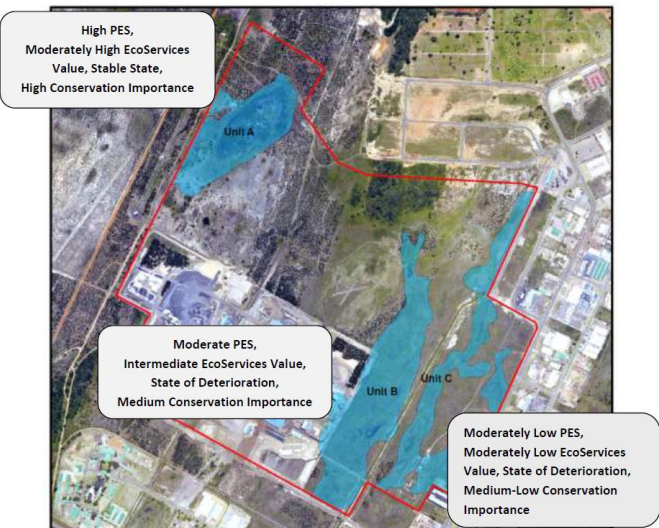
The DFFE 2017 Guideline on Need and Desirability says that during Scoping the questions presented in the guideline document should be used to identify issues to be addressed in the EIA process and alternatives that should be considered. In the EIA Report, the questions must again be considered, but for those questions for which the "scoping" found that no further information were required, it can simply be reported that the questions were dealt with during scoping, with the remaining questions having to be considered in terms of the additional information generated during the assessment stage. Table 9-1 presents the questions where responses emanate from additional information has been generated during the assessment stage.

Table 9-1: Questions from DFFE 2017 Need and Desirability Guideline Document

Questions (DFFE, 2017)		Response
PART I: NEED		
1.	Is the land use associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to be the relevant environmental authority?	Yes. The proposed project will be located on a property owned by the RBIDZ. This site is zoned as General Industrial (IDZ Industry) and is in line the IDP of uMhlathuze Local Municipality. According to the IDP, the RBIDZ serves to boost economic activity in the area. The proposed project will contribute to the local, regional and national economy as described in Section 9.1.

Questions (DFFE, 2017)		Response
2.	Should the development, or if applicable, expansion of the town/area concerned in terms of this land use occur here at this point in time?	<p>Yes. The proposed project forms part of the RBIDZ. The relevant land development application for the IDZ was submitted to the uMhlatuze Local Municipality and was approved in May 2014.</p> <p>Authorising the project will allow Nyanza to construct and operate a new plant that meets international standards and needs and will aid the recovery of the area's socio-economy following the Covid-19 pandemic.</p>
3.	Does the community/area need the activity and the associated land use concerned? This refers to the strategic as well as local level.	<p>Yes. This project will enhance the Richards Bay area as the African Continent's Titanium and Minerals Beneficiation Capital. Authorising the project will allow Nyanza to construct and operate a new plant that meets international standards and needs and will aid the recovery of the area's socio-economy following the Covid-19 pandemic.</p> <p>It is expected that the project will lead to the creation of about 1 200 jobs during its construction phase and 550 job during its operational phase. Approximately 680 of these jobs will be for skilled labourers, while 1 070 of these jobs will be for unskilled labourers. People from the Richards Bay area will be preferably employed as this will be the most economically viable option. Should the project not proceed, a large negative socio-economic loss will be a consequence for the region.</p>
4.	Are the necessary services with adequate capacity currently available (at the time of application) or must additional capacity be created to cater for the development?	The RBIDZ will make provision of the required services. Where additional services are required, Nyanza has made provision for the additional services in the proposed project.
5.	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of the services and opportunity cost)?	This specific development is not included in the IDP of the municipality, however, the property that will be developed is owned by RBIDZ, zoned as General Industrial. The RBIDZ is included in the infrastructure planning of the municipality, catering for the development of this project as well.
6.	Is the project part of a national programme to address an issue of national concern or importance?	<p>Yes, the proposed project forms part of the RBIDZ, whose strategic intent is to realize the fundamental objectives as set out by the Cabinet upon creating the IDZ Programme in September 2000, namely:</p> <ul style="list-style-type: none"> • Develop and establish a purpose built world-class industrial park incorporating a delimited Customs Controlled Area and linked to the Richards Bay International Port; • Provide quality infrastructure including Information and Communications Technology (ICT) and transport infrastructure, business and utility services; • Attract foreign and local investment projects which create jobs and are export led and sustainable; • Make arrangements for and mobilise financial, human and other resources for the development of the RBIDZ; • Promote, foster and mentor BEE and SMME business opportunities in and around the zone. • It is expected that the development of Phase 1F will trigger a large inflow of foreign and domestic investment, leading to the generation of additional economic activity and creation of employment opportunities. <p>This project will enhance the Richards Bay area as the African Continent's Titanium and Minerals Beneficiation Capital and will result in creation of significant employment and business opportunities for local businesses.</p>

PART II: DESIRABILITY		
7.	Is the development the best practicable environmental option for this land/site?	Yes. The proposed project will be located on a property owned by the RBIDZ. This site is zoned as General Industrial (IDZ Industry) and is in line with proposed project's description.
8.	Would the approval of this application compromise the integrity of the existing approved and credible IDP and SDF as agreed to by the relevant authorities?	No. The project forms part of the RBIDZ which was approved by the local municipality in terms of the KwaZulu Natal Planning and Development Act (Act 6 of 2008) in 2014. Both the IDP and SDF also take into account the RBIDZ 1F development.
9.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g., as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	<p>No. The project will be located on the property owned by the RBIDZ and will not compromise the integrity of existing management priorities. An EMF for the Richard's Bay was developed, which specifically notes the RBIDZ Zone 1F where the Nyanza project will be located.</p> <p>As part of the management guideline, the EMF highlights the following:</p> <p>The wetlands and ecological linkages in Phase 1F must be protected, maintained and managed as a contribution to the management of water quality by:</p> <ul style="list-style-type: none"> • Discouraging encroachment of development into and/or near wetlands; • Delineating appropriate ecological buffers in accordance with the land development types; • Discouraging reclamation or infilling of wetlands except if a no net loss policy is followed, if suitable offset receiving sites can be identified and if appropriate arrangement could be made to manage and monitor such arrangements; • Preventing the illegal dumping of waste into water features and stormwater gutters; and • Ensuring that activities which pose a risk of water contamination employ appropriate design measures to avoid and minimise this risk. <p>The RBIDZ made a decision where a no net loss policy is being followed. Whilst wetlands will be infilled as part of the Nyanza project (as approved by EA Ref 14/12/16/3/3/2/665), a Wetland Mitigation Plan was compiled as part of the RBIDZ EIA process. In addition, a site-specific Wetland Management Plan, which will take into account the RBIDZ Wetland Mitigation Plan, will be developed as part of the EIA process.</p> <p>The management guidelines included in the EMF will be taken into account in the EMPr for the proposed project. The approval of this application will not compromise the integrity</p>
10.	Do location factors favour this land use at this place? (this relates to the contextualization of the proposed land use on this site within its broader context).	Yes. The proposed site is located on a property owned by the RBIDZ that is zoned as General Industrial (IDZ Industry) and is in line with proposed project's description. The area is also adjacent to other industrial developments.
11.	How will the activity of the land use be associated with the activity being applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	<p>The biodiversity undertaken as part of the RBIDZ found species of value and a search and rescue team was mobilised. It is expected that the proposed project will result in clearance of vegetation, which will result in localised loss in vegetation. A site-specific biodiversity impact assessment will be undertaken. Should any additional species of conservation concern be identified, these will be relocated to the designated conservation area located adjacent to the proposed project site. The biodiversity assessment will also include a biodiversity management plan that will be incorporated into the project EMPr.</p> <p>A heritage impact assessment conducted for the greater RBIDZ found no heritage and cultural areas located on the RBIDZ</p>

		<p>property. A site-specific phase 1 HIA will be undertaken to verify that there are no heritage and cultural resources that will be affected by the proposed project. The HIA will include mitigation measures that will be implemented should there be any heritage resources located on the site and will also include a chance find protocol that will be implemented should there be any heritage resources missed during the HIA that will be uncovered.</p> <p>According to the wetlands delineation undertaken for RBIDZ, there are currently three wetlands present on the property. It must be noted that the EA issued for the RBIDZ (Ref 14/12/16/3/3/2/665) makes provision for the following:</p>  <ul style="list-style-type: none"> • Wetland Unit A will be conserved and will have a 30m buffer; • Wetland Unit B may be partially infilled; and • Wetland Unit C may be infilled.
<p>12.</p>	<p>How will the development impact on people's health and well-being? (E.g., In terms of noise, odours, visual character and sense of place, etc.)?</p>	<p>During construction, there will be particulate emissions (dust) related to debris handling, materials transportation, storage, handling, and transfer; and open areas (windblown emissions). Gas emissions are also expected to occur due to vehicle and construction equipment activity (exhaust fumes). These impacts, however, taking into consideration, the area where the proposed 80 000 tpa TiO₂ pigment plant will be located, are expected to be of low significance and can be mitigated and managed to acceptable levels, with a post mitigation impact that is negligible.</p> <p>Movement of construction vehicles and machinery result in the production of construction related noise which may cause a nuisance to people working and living in the vicinity of the proposed property. However, the implementation of appropriate mitigation measures would reduce the noise levels to remain within applicable and acceptable SANS levels (SANS 10103:2008). Occupational health and safety standards will apply.</p> <p>It is expected that the project will not have any significant impact on the visual character and sense of place, especially since the 80 000 tpa TiO₂ pigment plant will be located in the RBIDZ, adjacent to other industrial developments.</p>
<p>13. 13.</p>	<p>Will the proposed activity or the land use associated with the activity being applied for, result in unacceptable opportunity costs?</p>	<p>No. The objective of the project is to construct and operate an 80 000 tpa TiO₂ pigment plant, which will result in numerous socio-economic benefits.</p> <p>The property affected by the proposed facility is owned by the RBIDZ and is currently not earmarked for other use. In addition, the proposed project is in line with the purpose of the IDZ, which is earmarked for industrial development. The impact assessment to be undertaken will include mitigation measures</p>

		that will be implemented by Nyanza to minimise any negative impacts as well as enhance the positive impacts associated with the project.
14. 14.	Will the proposed land use result in unacceptable cumulative impacts?	No. It is expected that the project may result in negligible cumulative impacts on the environment. It is anticipated that the majority of the impacts will be short lived, during the construction phase. It is however expected that implementation of the mitigation measures included in the EMPr will reduce the significance of the impact during all phases of the 80 000 tpa TiO ₂ pigment plant. The impact assessment phase of the EIA process will include an assessment of the cumulative impacts.

10 Description of the Baseline Environment

The following section presents an overview of the biophysical and socio-economic environment in which the proposed project is located, so as to:

- Understand the general sensitivity of and pressures on the affected environment;
- Inform the identification of potential issues and impacts associated with the proposed project, which was assessed during the impact assessment phase;
- Identify gaps in available information to inform specialist study requirements; and
- Start conceptualising practical mitigation measures.

The description of the baseline environment is based on existing specialist studies and EIA Reports compiled for Phase 1 of the IDZ, existing environmental databases and information from the PDTC EIA process undertaken for Nyanza.

10.1 Climate

The Richards Bay area is located on a coastal plain. According to the Köppen-Geiger climate classification, the climate is Cfa (humid subtropical climate). Figure 10-1 shows that temperatures peak from December to February at approximately 35 °C with a minimum of 18 °C, dropping to daytime heights of approximately 28 °C and a minimum of 12 °C from June to August (TCSG, 2022).

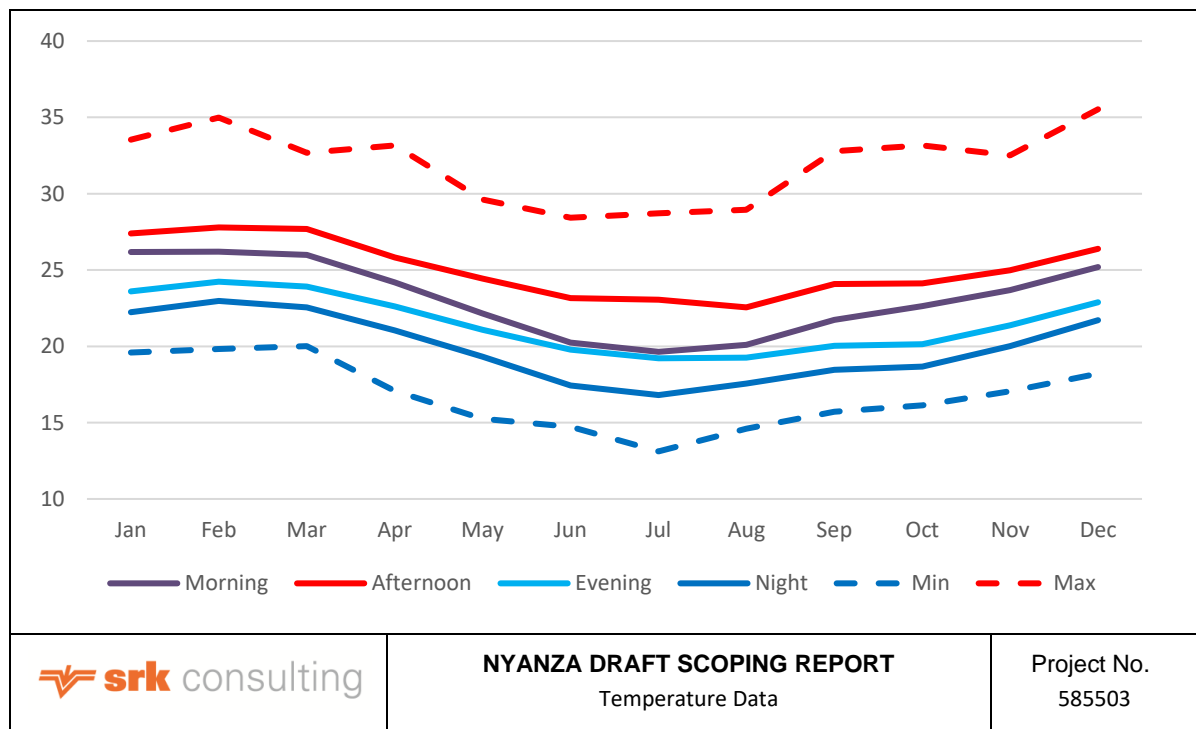


Figure 10-1: Temperatures (°C) (TCSG, 2022)

The relative humidity is high, ranging from a high of 95% in the summer to a low of 28% in the winter (Figure 10-2) (TCSG, 2022).

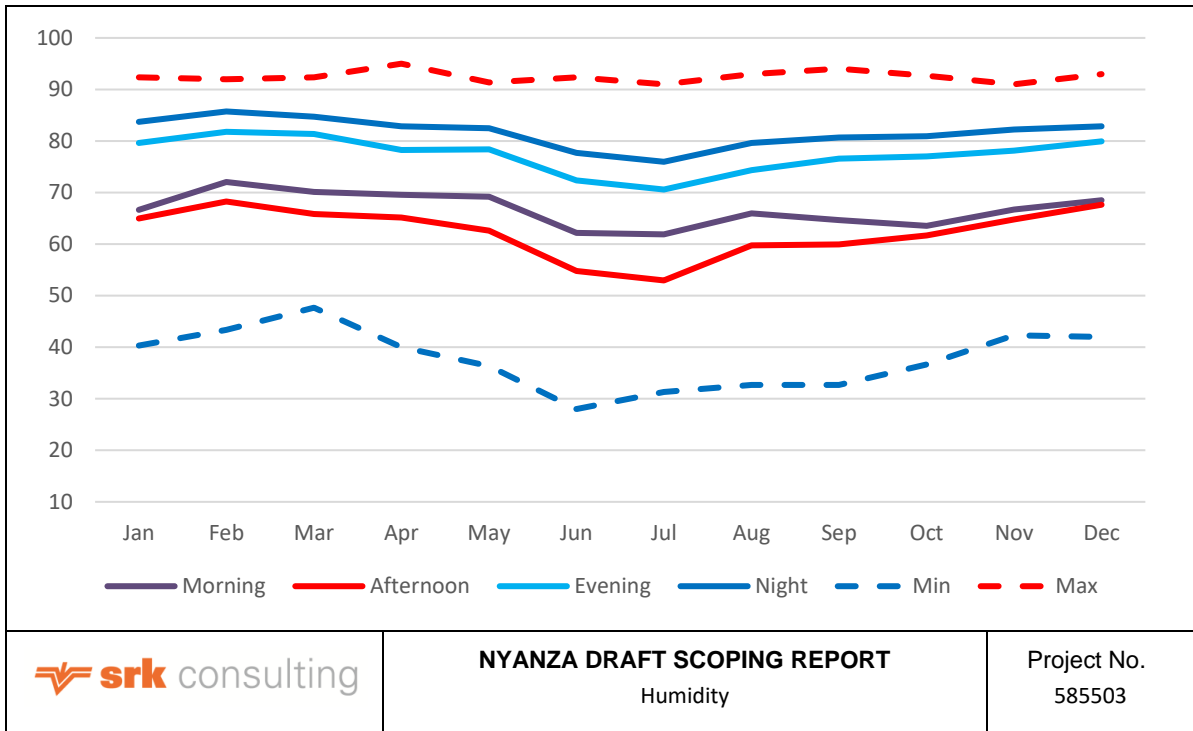


Figure 10-2: Relative humidity (%) (TCSG, 2022)

Figure 10-3 shows that the wind most often blows from the South, South-East, and East, but shifts to North-East in the summer (TCSG, 2022).

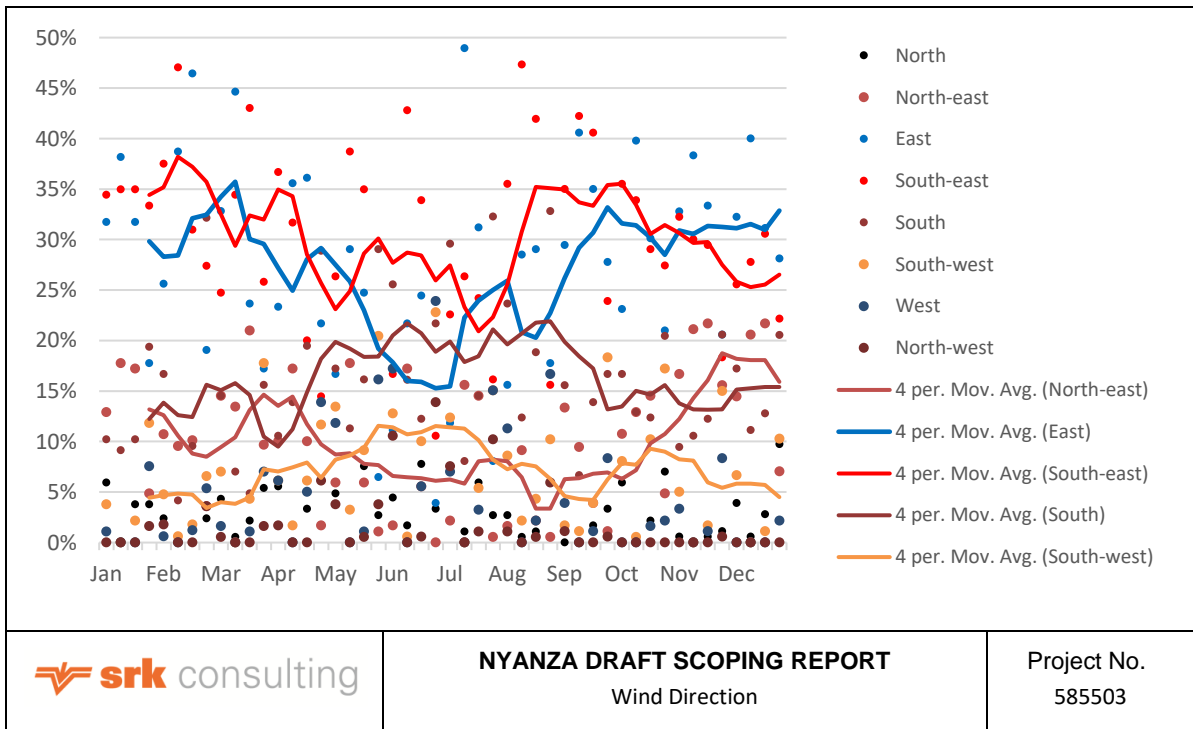


Figure 10-3: Wind direction (TCSG, 2022)

Mean wind speeds range between 16 km/h and 24 km/h, only dropping below 10 km/h rarely (Figure 10-4) (TCSG, 2022).

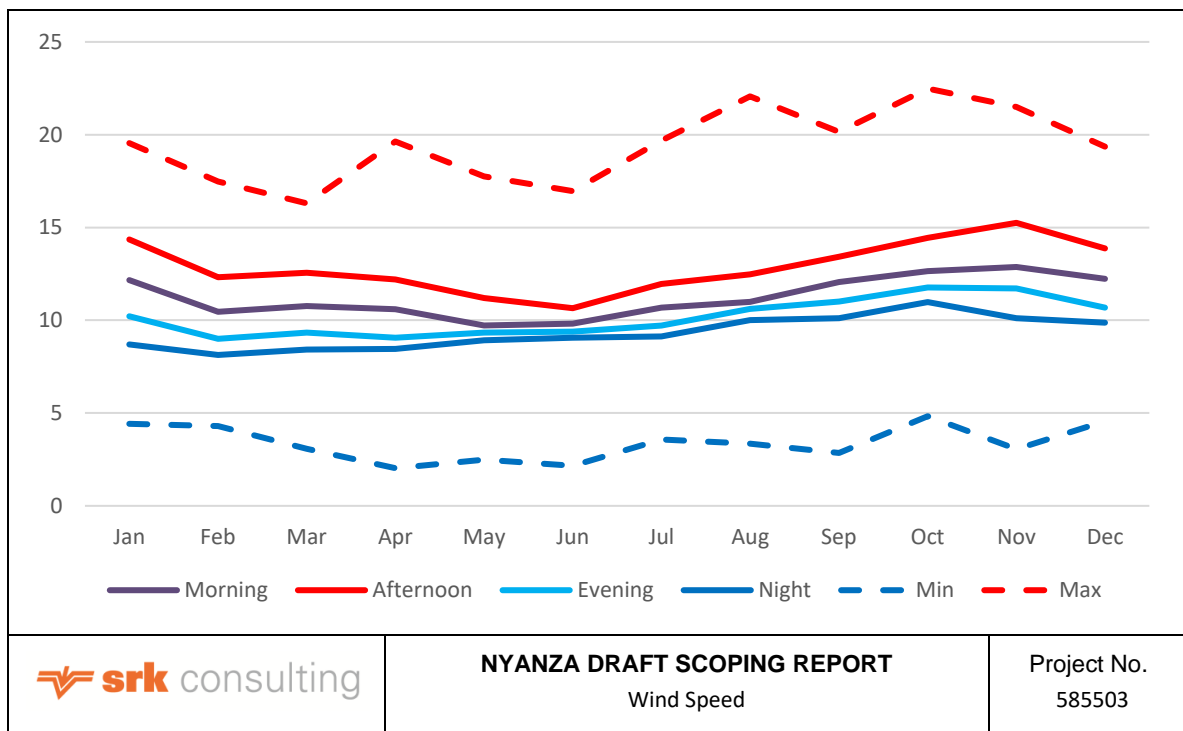


Figure 10-4: Wind speed at 10 m (km/h) (TCSG, 2022)

Mean annual rainfall was around 620 mm in 2017, 2018, and 2019 (Figure 10-5) and the long-term average rainfall is estimated to be approximately 1 200 mm, which was particularly low. Months with the highest rainfall are May, and November and December, although May, August, and October have the highest precipitation per hour (TCSG, 2022).

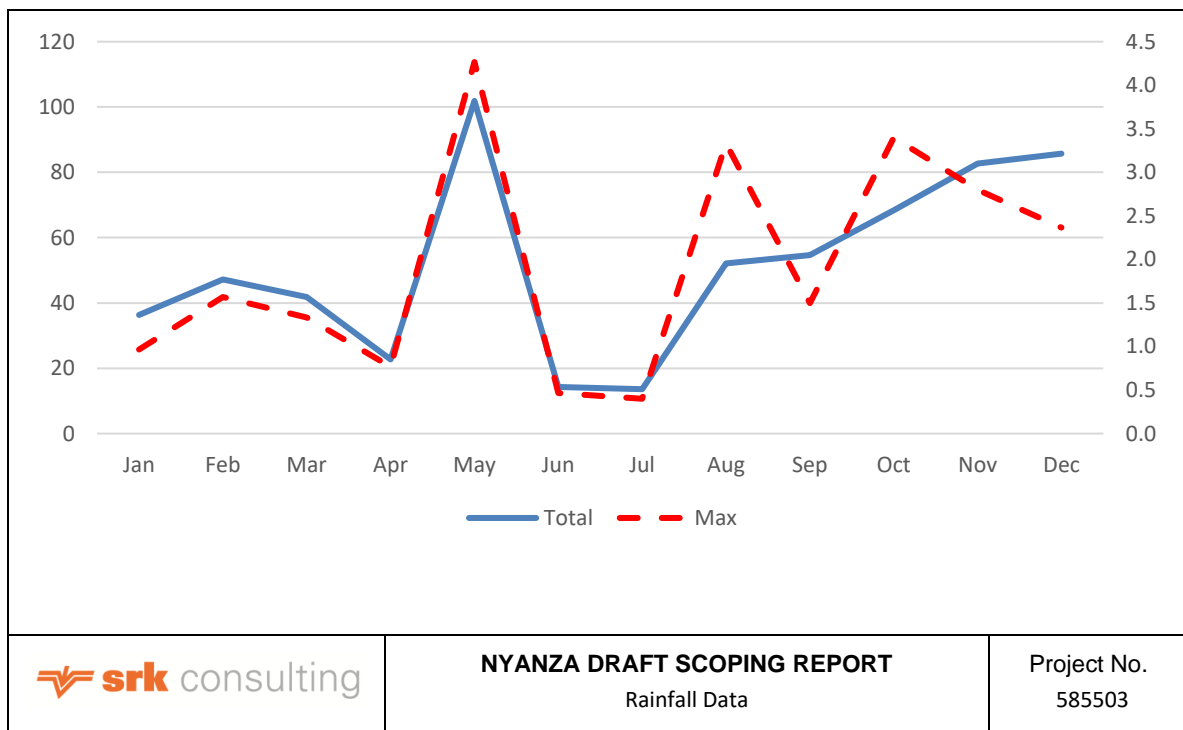


Figure 10-5: Total rainfall per month (mm) and maximum rainfall in an hour (mm) (TCSG, 2022)

Figure 10-6 shows that rainfall is more-or-less evenly spread during different times of the day for most months but are slightly more during evening and night-time in October, November, and December (TCSG, 2022).

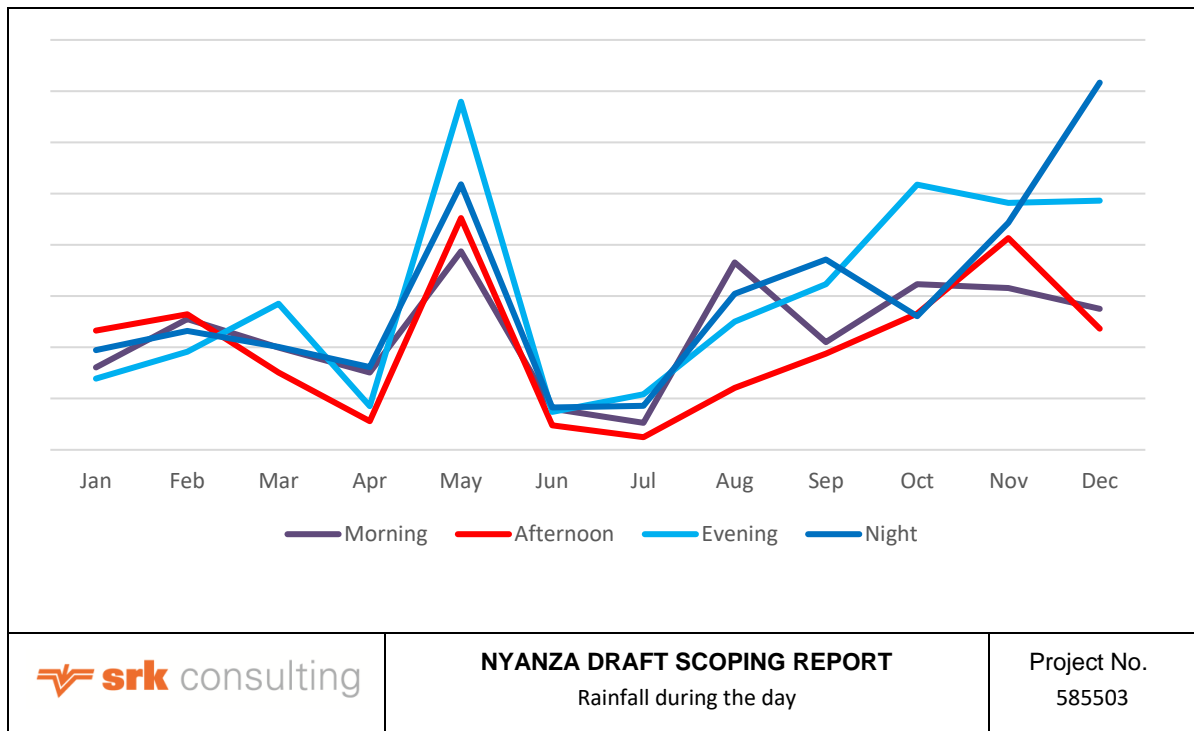


Figure 10-6: Occurrence of rainfall during the day (TCSG, 2022)

10.2 Topography

The terrain is overall very flat with some gradual slopes towards the South at about 0.4% and some large pans. On the northern portion of the site, there is a sand dune and a high lying area. The site is approximately 67 m above sea level in the North and about 42 m to 44 m above sea level in the South (NEMAI Consulting, 2016).

The area’s topography has three broad landforms. The coastal area is made up of Neogene marine and coastal aeolian sediments, to the inland, a broad, curving band running parallel to the coastal sediments include areas North of Empangeni, comprising of post-African surfaces (partly planed). The area South of Empangeni comprises of dissected landforms of various ages (NEMAI Consulting, 2016).

A depiction of the area’s topography is provided in Figure 10-7.

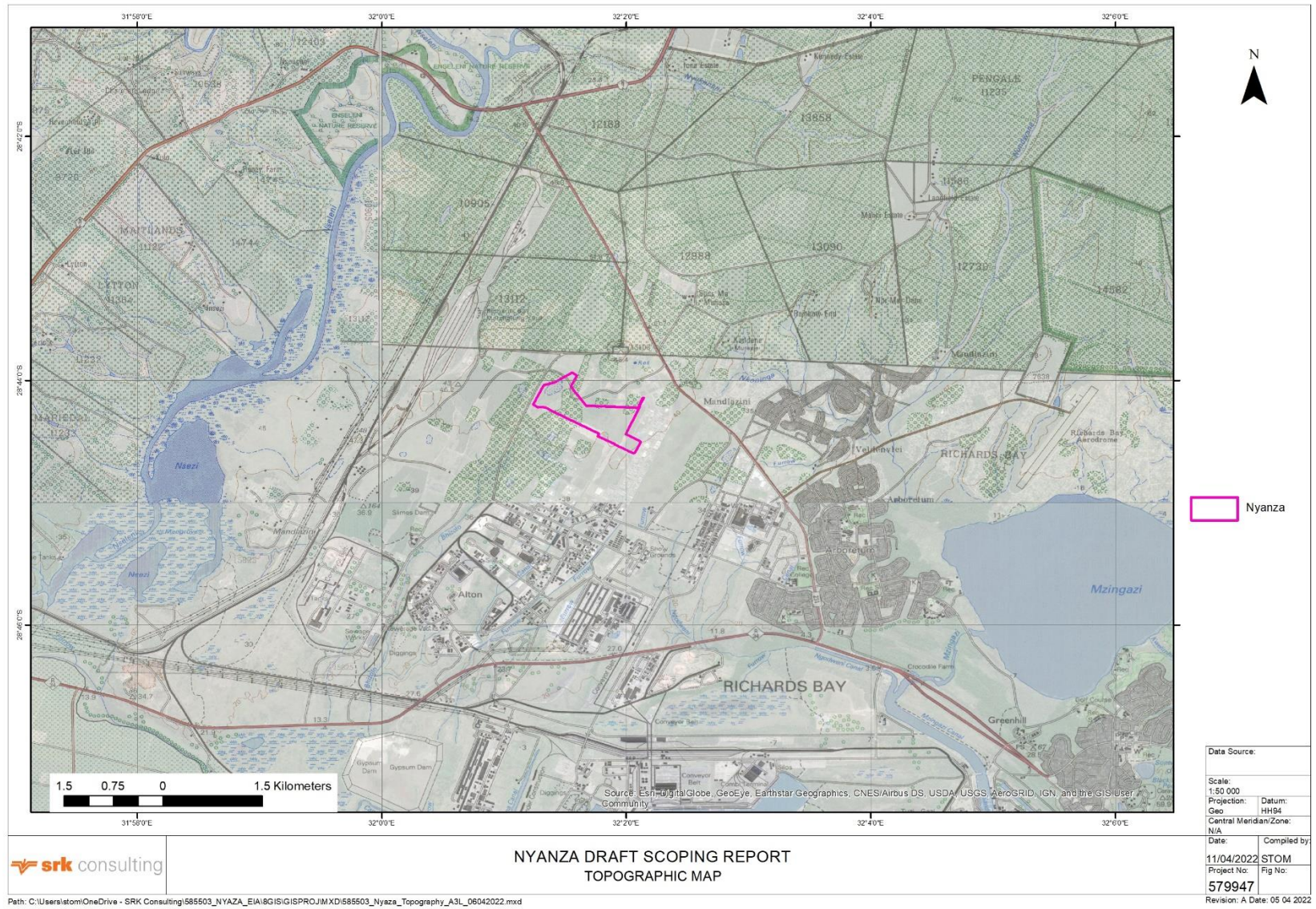


Figure 10-7: Topography

10.3 Geology

The site is situated on the Maputaland Coastal Belt (a generally flat landscape). This landscape comprises of quaternary sediments of marine origin that is about 18 000 years old. These sediments are yellowish in colour. Argillaceous redistributed sand of the Berea and Muzi Formations also forms part of the Maputaland Coastal Belt. The soils have very poor nutrition and is well leached, except in the interdune depressions where soils are rich in organics (Mucina & Rutherford, 2006).

Main land types on the site are “Ha” and “Hb” and may include the Constantia, Shepstone, and Vilafontes soil forms, while the “Db” land type is less distributed, associated with various geological units like the basement granites, Natal Group sandstones, Ecca shales and sandstones, Dwyka tillites, mudstones, as well as shale and/or sandstone of the Escourt, Nyoka, Emakwezini, Clarens, and Ntabene Formations, sandstone/siltstone of the Zululand Group, and some Cenozoic deposits. The broad-spectrum soil pattern of the “Db” land type is situated in low gradient slopes and are thus prone to flooding and inundation. The “Db” land type is characterised by duplex soils and has non-red B horizons (Hatch, 2019).

Figure 10-8 provides the underlying geology of the study site and the geology of the surrounding area.



Figure 10-8: Geology

10.4 Geotechnical

According to the geological investigation that was undertaken for the RBIDZ Phase 1F (Engeolab, 2014), the site is underlain by medium dense soils, grading from approximately 1.0 m into silty to clean sands that is compressible, or sandy clays that is fully expanded with low shear strengths causing poor foundation conditions because of its lowered bearing capacity and increased settlement potential.

The zones identified on Phase 1F are described as follow (Engeolab, 2014):

- Zone 1: Main geotechnical constraints recorded within Zone 1 are compressible and potentially collapsible soils with low bearing capacity, requiring modified construction techniques.
- Zone 2: As in Zone 1 but this zone is subject to seasonal ponding and seepage, requiring adequate drainage.
- Zone 3: Zone 3 comprises of 5 areas with recognized wetlands (no development is recommended).

The proposed project is located within zones 1 and 2. A site specific Geotechnical Assessment will be undertaken as part of the impact assessment for the proposed plant. Findings from the assessment will be included in the EIR and EMPr.

10.5 Soils, Land-Use, and Land capability

The City of uMhlathuze Local Municipality zoned the site as General Industrial, therefore the Industrial Development Zone (IDZ) (Figure 10-9). The IDZ provides for industries of lower impact to be developed.

Soil underlying the study area is provided in Figure 10-10 and can be described as Q: Moderate to deep, sandy, and flat. the DAFF Soil Classes information shows that the site occurs on imperfectly drained sandy soils, with favourable water-holding properties. These soils are usually highly erodible.

According to the Department of Agriculture, Forestry and Fisheries (DAFF) land capability GIS information RBIDZ 1F occurs in area of moderate potential arable land.

A site-specific soils and land capability assessment and hydropedology assessment will be undertaken during the impact assessment phase of the process.

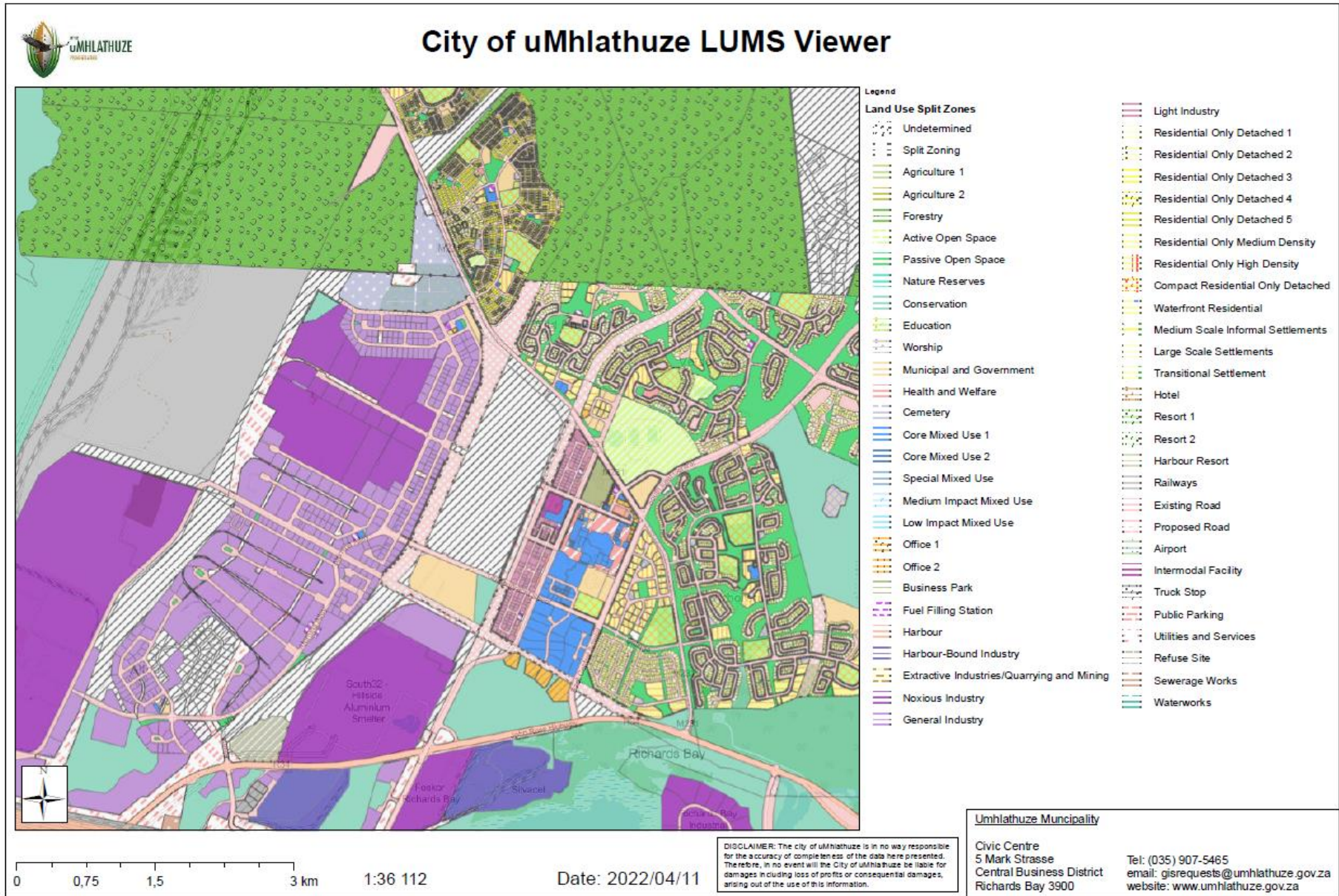


Figure 10-9: Land use zoning

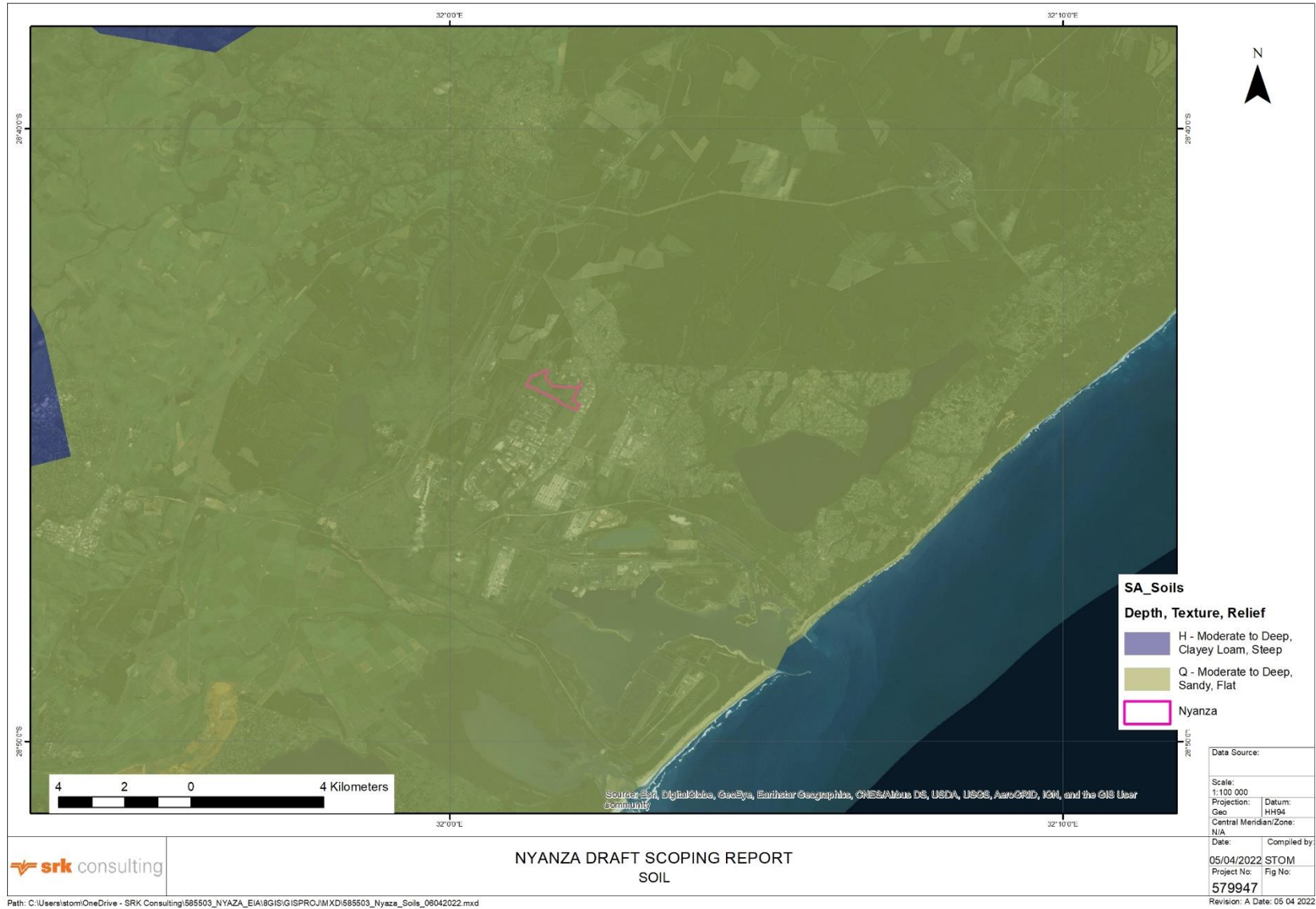


Figure 10-10: Soil map

10.6 Air Quality

The project site and surrounding area's air quality was extracted from the EIA done by NEMAI in 2016 (NEMAI Consulting, 2016) and PTDC EIA (Hatch, 2019).

The larger area surrounding the project site includes many different commercial, and light and heavy industrial activities which includes two aluminium smelters, a phosphoric acid fertilizer plant, kraft process paper mill, etc. The proximity of some important industries to residential areas are a cause for concern. The project area's current air quality is largely influenced by industrial activities located within the RBIDZ, as well as by farming activities, residential fuel burning, domestic fires, dust entrained by vehicles, and vehicle exhaust emissions. These sources of emissions vary from activities generating coarse airborne particulates (e.g., dust from roads when farmland is prepared) to fine particulate matter (e.g., vehicle exhausts).

Other sources like occasional residential fires in the Brackenham area. Unpaved roads that lead to emissions constitute a major section of emissions to the atmosphere in South Africa. Vehicles travelling on unpaved roads cause surface material to pulverise. Particles are lifted and dropped from wheels rolling over the surface, exposing the surface to strong turbulent air shear with the surface. Turbulence behind the vehicle continues after the vehicle passed. Unpaved road dust emissions are thus a function of traffic and the roads' silt loading. Emissions resulting from paved roads are less than emissions resulting from unpaved roads, but both contribute to the atmosphere's particulate load. Fugitive dust emissions occur due to the re-suspension of loose material present on the road surface.

Wind erosion generates wind that is dependent on the frequency of erodible surface disturbance. Every time a surface is disturbed, it becomes more erodible. Combustion gases (SO₂, CO, HC, and NO₂) are released from industrial areas, vehicle exhausts, power generators, and burning activities. The sources are not supposed to be exhaustive but are the main contributors (Hatch, 2019).

It will be extremely important to make sure that the 80 000 tpa TiO₂ Pigment Plant is designed in compliance with relevant international, national, and local air quality standards and regulations. An Air Quality Impact Study will be undertaken as part of the EIA phase and the AEL application.

10.7 Noise

Noise in the project area is currently mostly generated by vehicle traffic and other surrounding industries. During the construction phase, noise impacts may result due to the operation of machinery and equipment, along with noise from construction vehicles. A number of noise producing equipment have been identified, including the levels of noise expected.

A noise impact assessment (specialist study) will be undertaken, which will include a noise baseline assessment, ambient environmental acoustic monitoring, acoustic modelling results and impacts, as well as detailed recommendations, including mitigation measures and ongoing noise monitoring if deemed necessary.

10.8 Visual

The RBIDZ Phase 1F, where the proposed plant will be located is bordered by mixed-use industrial developments as well as residential areas and open areas. It is expected that there will be localised visual impacts during the construction phase due to clearance of vegetation on the affected properties. Dust emissions during site clearance and construction activities will also result in localised visual impacts.

Due to current operations at the RBIDZ and surrounding industrial developments, in close vicinity to the proposed plant location, it is expected that the operation of the plant will not result in any significant

additional visual impacts. A visual impact assessment will be undertaken during the impact assessment phase and will include mitigation measures that Nyanza will be required to implement to minimise the significance of the impacts. The EMPr to be compiled for the proposed project will provide for practical mitigation measures that may be implemented to avoid and/or minimise the impacts.

10.9 Surface Water

According to the 2017 SANBI BGIS Strategic Water Source Areas (SWSAs) database, the project area is considered strategically important for economic and water security at a national level because it is located in both the Richards Bay ground water-fed estuary SWSA and the Zululand Coast surface water (Hatch, 2019).

The project site falls within quaternary catchment area W12F, in the Pongola-Mtamvuna Water Management Area (WMA) (Figure 10-11). This WMA includes the following large rivers: Pongola, Mhlathuze, Mkuze, Thukela, Mvoti, and Umgeni amongst others. Main water resources in the uMhlathuze Catchment are the Nseleni and uMhlathuze rivers, Goedertrouw dam, and irrigation dams and impoundments, lakes, and pans (like the Nsezi, Mzingazi, Lake-Cubhu, and Nhlabane Lake), riparian areas, hillslope seepages, valley bottom wetland systems, and Mhlathuze River Floodplain and Estuary. The Qhubu, Mzingazi, and Nhlabane Lake, Mhlathuze Floodplain, Mhlathuze Estuary and associated valley bottom wetland, and Mountainous seeps in the Mhlathuze River's upper reaches are the most important wetland systems (KZN PPC, 2016). The catchment's water resources were awarded a PES rating of C (moderately modified) (DWS, 2019).

The Bizolo perennial river is located to the South of Alton and the Nsezi River is located West of Alton. Several non-perennial pans are identified by the national spatial data in the area. There are three main stormwater drainage channels in Alton, of which two traverse the RBIDZ's 1F Estate. The proposed project site is located west of the central drainage line (Hatch, 2019).

A hydrology study will be undertaken, and a stormwater management plan will be developed during the impact assessment phase of the process.

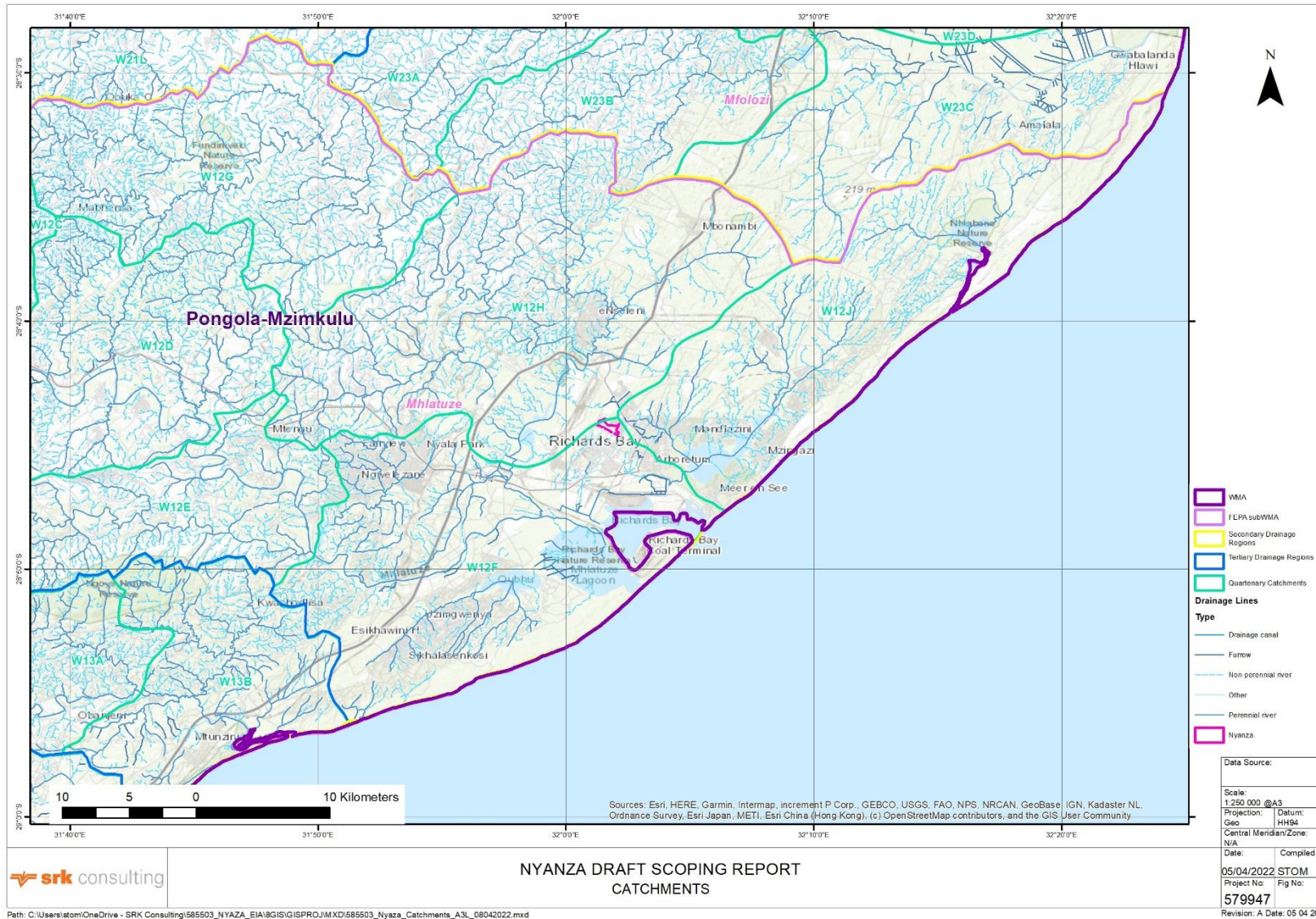


Figure 10-11: Water Management Areas

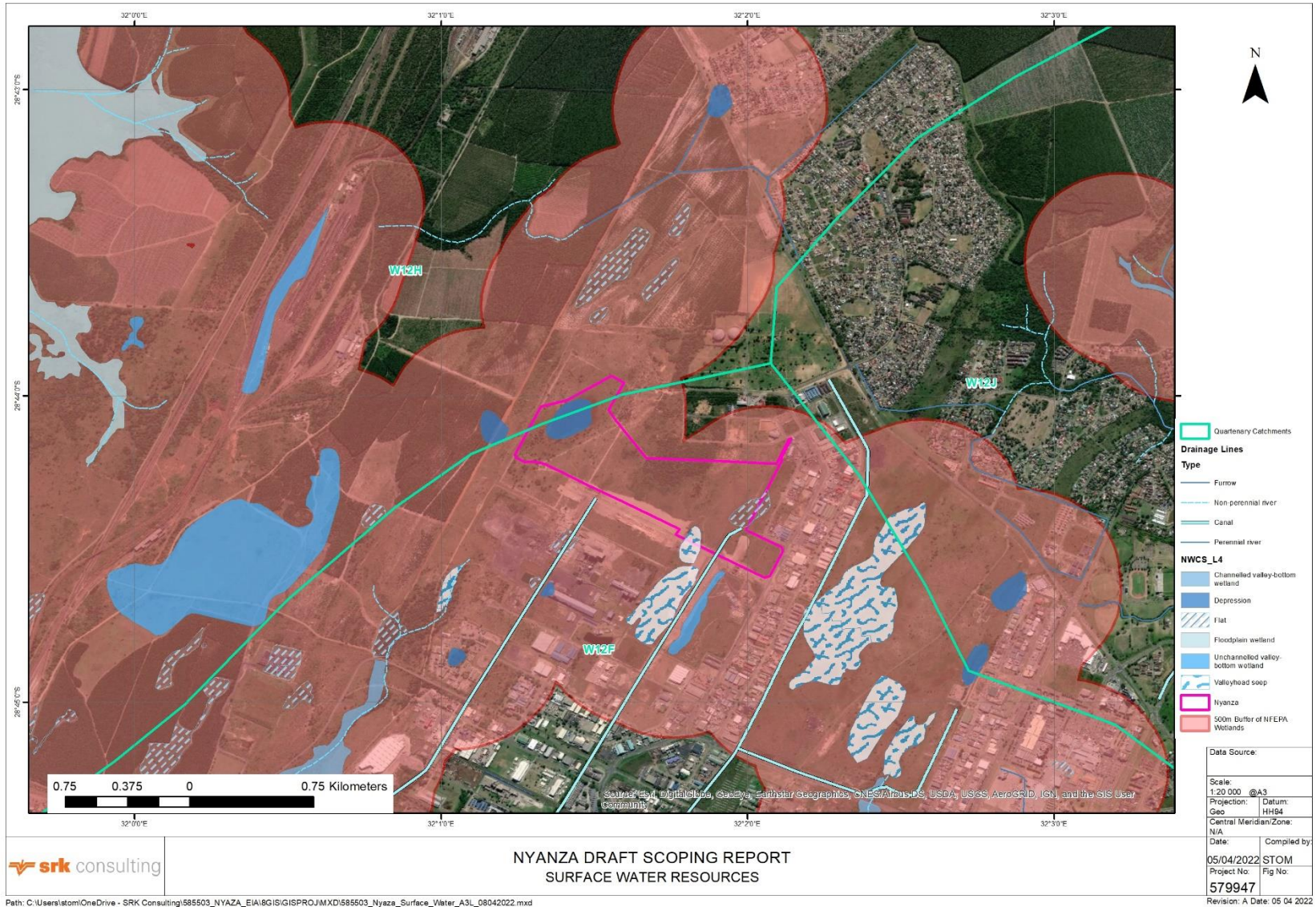


Figure 10-12: Surface water resources

10.10 Geohydrology

The groundwater baseline characterisation is based on information from previous studies (Engeolab, 2014 and Hatch, 2019). A site-specific geohydrology study will be undertaken during the impact assessment phase of the process.

10.10.1 Aquifer Characterisation

According to a geohydrological specialist study undertaken as part of the RBIDZ WULA process, the hydrology is linked with the coastal plain's shallow water table and wetlands tend to be a representation of the soil surface/groundwater interface. Soils are described as partially saturated and unconsolidated. The primary unconfined aquifer has high clay and sand content in general, less than 30 m thick. The primary aquifer or estuary horizons comprise of fine-grained sand separated by consecutive layers that act as aquitards. Aquitards is impermeable, forming the barrier between the thin primary sand (or aquifers). A seasonal aquifer is suspended on the clayey horizons, particularly after high rainfall events. Flow would then be expected to follow the surface contours (Engeolab, 2014).

The main aquifer overlays a deeper siltstone from Cretaceous marine deposits, representing the study area's lower boundary. Alluvial processes incised this formation under different marine environments with significant paleochannels which could impact the system's hydrodynamics significantly. Fracturing of the aquifer is expected below a few tens of metres that is less frequent and less open because of the increased pressure. An aquifer of slow groundwater velocities and low hydraulic conductivity is a result.

Mean water depth is about 1.5 to 2.5 m below ground level and levels of groundwater generally follow the topography. The site's expected flow will be near horizontal.

High to medium permeable residuum, high recharge rates, and high groundwater potential aquifer that has a substantial aerial extent increase the significance of the aquifer along with a groundwater pollution risk (Hatch, 2019).

According to NFEPA, there are no areas with high groundwater recharge (recharge ratio of 300) in KZN. The project area has a groundwater recharge ratio of 165 in the East, 171 in the centre, and 170 in the West (Hatch, 2019).

The classification map of aquifers in South Africa show that the area of study is identified as a minor aquifer system.

10.10.2 Groundwater Quality

South Africa's groundwater quality map indicates that the groundwater in the area's electrical conductivity varies between 150 and 370 mS/m (milli siemens per metre).

The groundwater study undertaken by Engeolab; the groundwater quality is generally of good quality. With the exception of the Iron (Fe) and Manganese (Mn) concentrations, all analysed parameters were classified as ambient and representative of the natural, background water quality. The Fe and Mn concentrations in the majority of samples were very high and above drinking or ambient standards. This was attributed to the industrial processes in the area.

10.10.3 Hydro census

There are no private boreholes in the area, however there are some industries that have extracted boreholes for either observation or groundwater monitoring (Engeolab, 2014). It was estimated that

groundwater use in the area is low, approximately 0.55Mn³/annum) in comparison to the exploitation potential of 15Mn³/annum and the general authorisation limit of 400m³/ha/annum (Engeolab, 2014).

No existing production boreholes or extraction boreholes were found on the proposed RBIDZ 1F site. Only one monitoring borehole was found on the south-western corner of the site (it is believed that this belongs to the neighbouring property) (Engeolab, 2014).

10.11 Wetlands

A wetland assessment undertaken as part of the RBIDZ EIA found that there are three (3) wetland units that will be affected by the proposed Nyanza 80 000 tpa TiO₂ Pigment Plant. The wetlands identified are shown in Figure 10-13 (NEMAI, 2016).

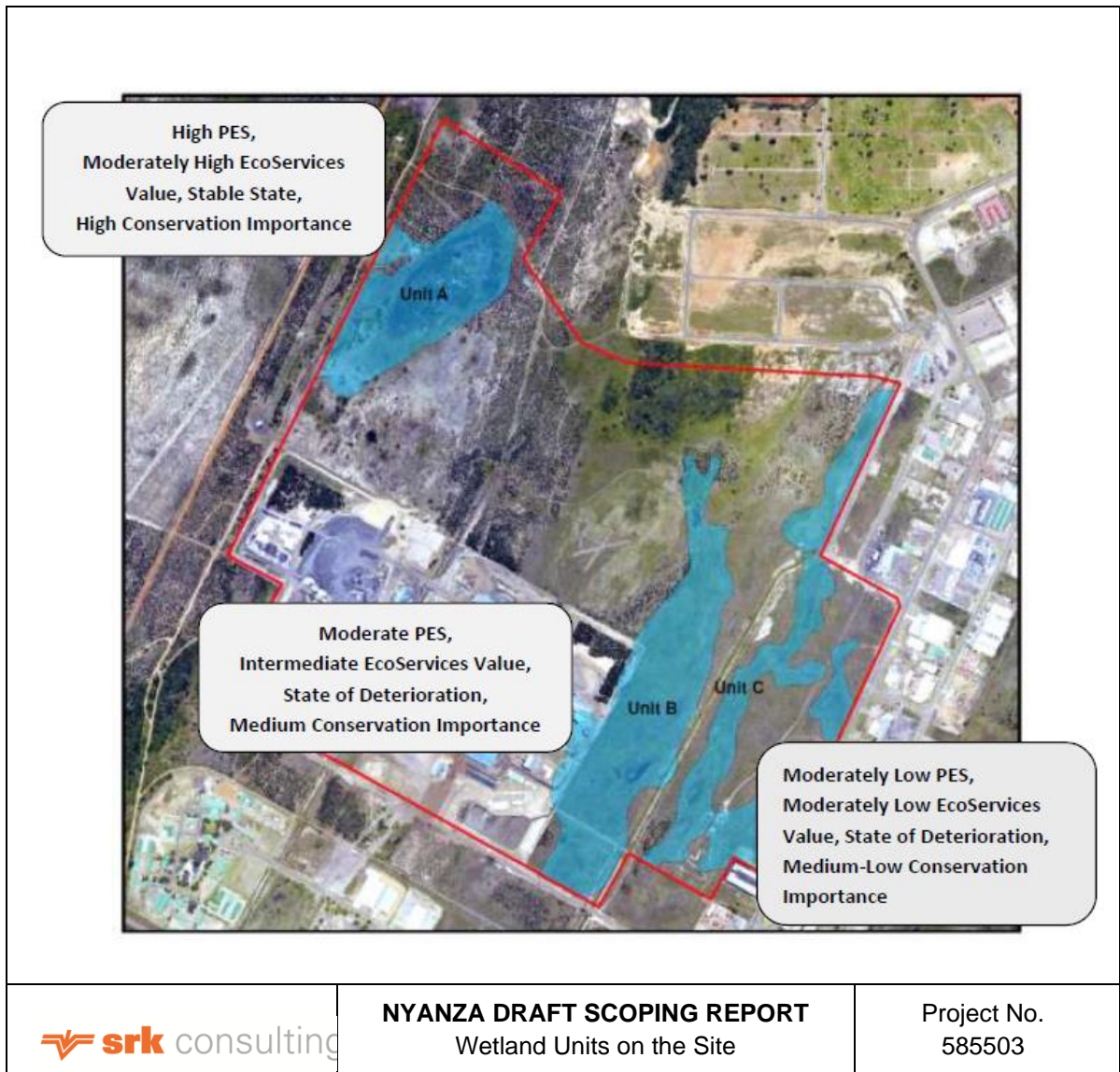


Figure 10-13: Status quo summary of RBIDZ Phase 1F wetland units indicating wetland attributes (NEMAI Consulting, 2016)

According to the study, the following recommendations were made in respect to the development of the wetlands in RBIDZ Phase 1F:

- Development of, as well as interference with, the functional and healthy wetland of Area A should be avoided in its entirety;

- Development of Area B is deemed generally unacceptable, due to the level of ecosystem functions it provides. However, development / in-filling of a portion of the wetland may be approved by the competent authority should a compelling and/or persuasive motivation be provided in relation to the socio-economic implications of the proposed development and should effective mitigation measures be proposed and approved; and
- Two options were considered for the potential development of Area C, the preferred developable wetland area, namely the development in the upper northern portion of the system only; or the development of the entire unit. The EA issued to the RBIDZ (Ref 14/12/16/3/3/2/665) authorised the development of the entire unit.

A site-specific wetlands and aquatic biodiversity assessment will be undertaken as part of the current EIA process. The specialist study will include the verification of the delineated wetlands, assessment of the potential impacts and compilation of a wetland management plan that will be incorporated into the EMP of the project.

10.12 Areas of Conservation Concern

According to Figure 10-14 the site for the 80 000 tpa TiO₂ Pigment Plant of Nyanza is not situated within a Marine Protected Environment or South African Protected Area. The project site is, however, located in a Critical Biodiversity Area (areas that are required to meet biodiversity targets for species, ecosystems or ecological processes) as shown in Figure 10-15.

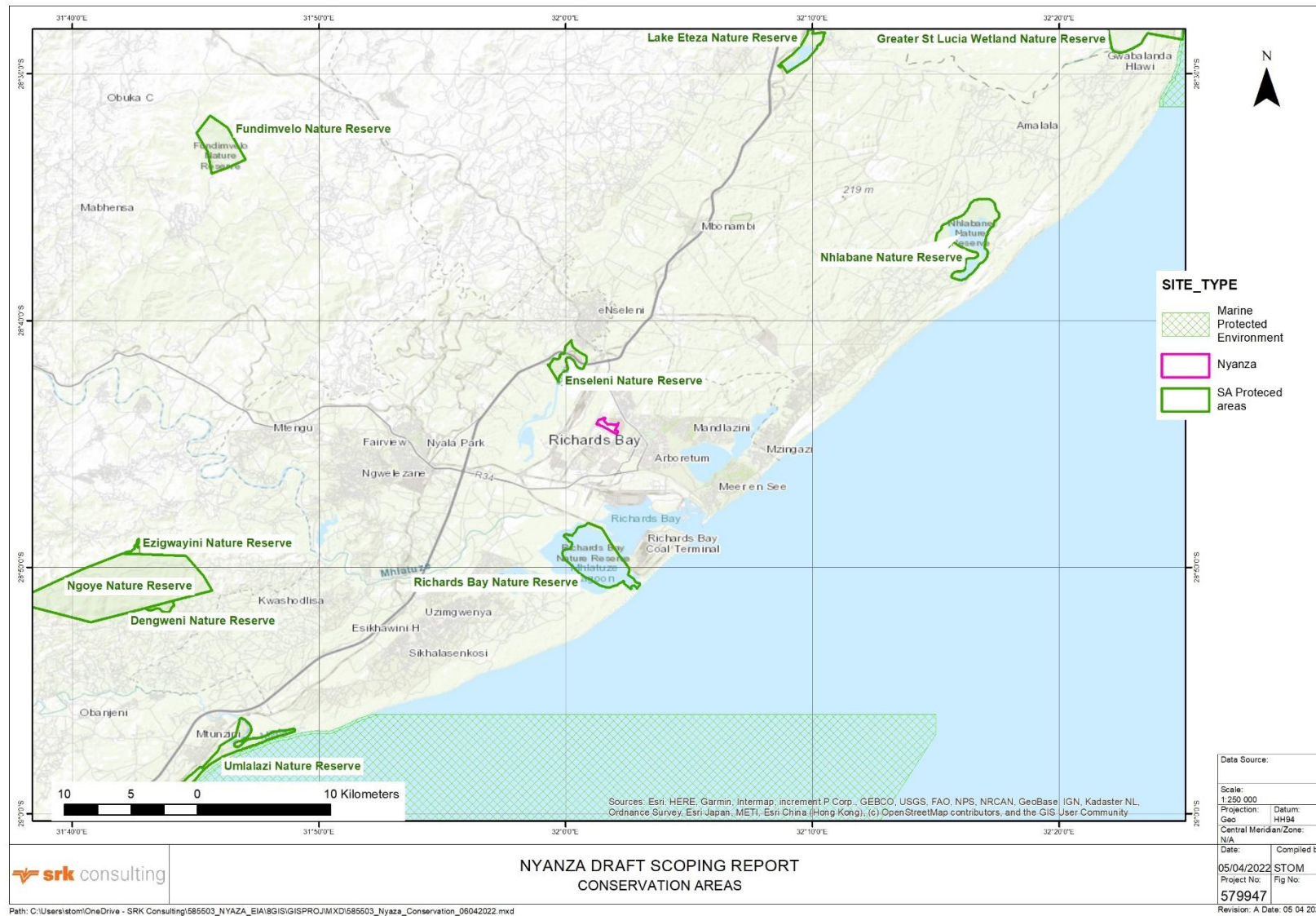


Figure 10-14: Areas of conservation concern

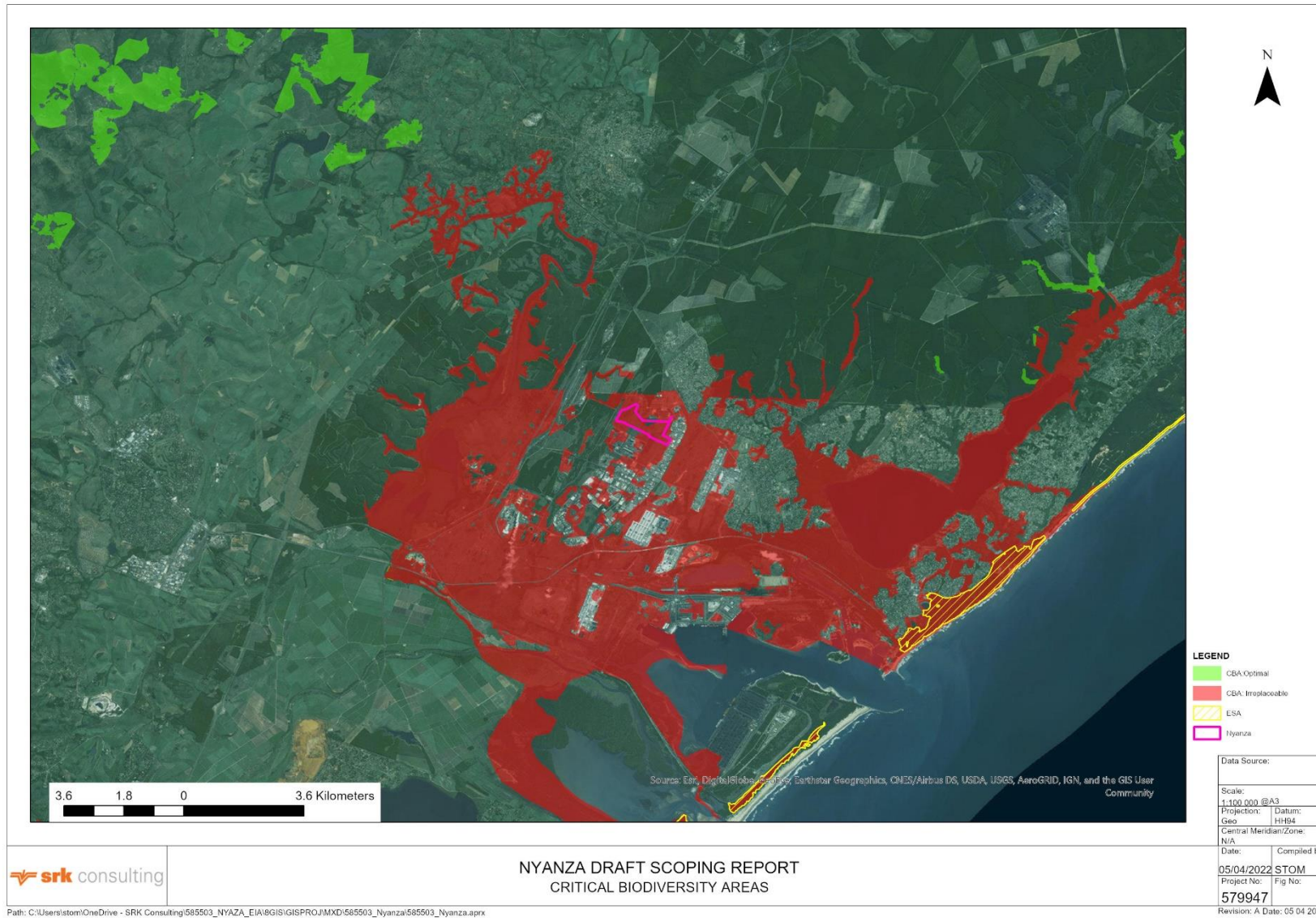


Figure 10-15: Critical Biodiversity Areas

10.13 Biodiversity

10.13.1 Broad-scale Vegetation Characteristics

The study area's vegetation type is the Maputaland Wood Grassland which is listed as endangered (Mucina & Rutherford, 2006); (SANBI, 2018). According to the KwaZulu-Natal Systemic Conservation Plan (KZNSCP), the study area consists of freshwater wetlands, KwaZulu-Natal Coastal Forests, and Maputaland Wooded Grassland. The KwaZulu-Natal Coastal Forests correlate with the Northern Coastal Forest (Mucina & Rutherford, 2006). Reference states for the study area are thus formed by the Maputaland Wooded Grassland and the Northern Coastal Forest.

10.13.2 Habitat Unit Results

Five broad habitat units were identified as (1) Degraded Hygrophilous Grassland, (2) Degraded Coastal Forest, (3) Thicket Habitat, (4) Freshwater Habitat, and (5) Transformed Habitat as shown in Figure 10-16 (photographs illustrating the typical habitat associated with the four (4) main habitat units identified within the affected property) and Figure 10-17 (Conceptual illustration of the preliminary habitat units associated with the study area).

- The Degraded Hygrophilous Grassland habitat has low floral species richness with a homogenous grassy layer consisting of scattered woody shrubs. The habitat can also be described as moist grassland. The abundance in the Degraded Hygrophilous Grassland habitat was low and the herbaceous layer was poorly developed. The unit, however, still proves habitat for an intermediate abundance of fauna and remains an important supporting unit.
- The Degraded Coastal Forest is mostly found in the study area's northern, central regions. This habitat consists of overlapping tree canopies and poorly developed grass layer. Faunal species favoured specifically the arboreal species. The Degraded Coastal Forest habitat had a moderately high species richness. Floral diversity was lower where AIP proliferation is evident. The habitat edges transition into encroached, dense thickets.
- The thicket habitat is situated in the northern, central regions, surrounded by the Degraded Coastal Forest habitat. This habitat is characterised by a dense shrub and tree layer and was tree-dominated. Significant AIP proliferation and bush encroachment was observed. Valuable shelter was provided by with habitat due to the encroachment but reduced floral diversity limits forage availability.
- The Freshwater Habitat consists of natural watercourse features and artificial freshwater features. All wetlands, although different, shared similar species. The Depression Wetland also supports obligate wetland species and provides a faunal niche habitat. This wetland also functions as a corridor and provides connectivity within the landscape and should be retained where possible. The Depression Wetland's floral diversity was moderate, while that of the Seep Wetlands and Wetland Flats varies between moderate and moderately low. The Earth canal supported a moderate to moderately low diversity of flora.
- The Transformed Habitat experienced complete transformation for the development of infrastructure. No habitat was available for plant species.

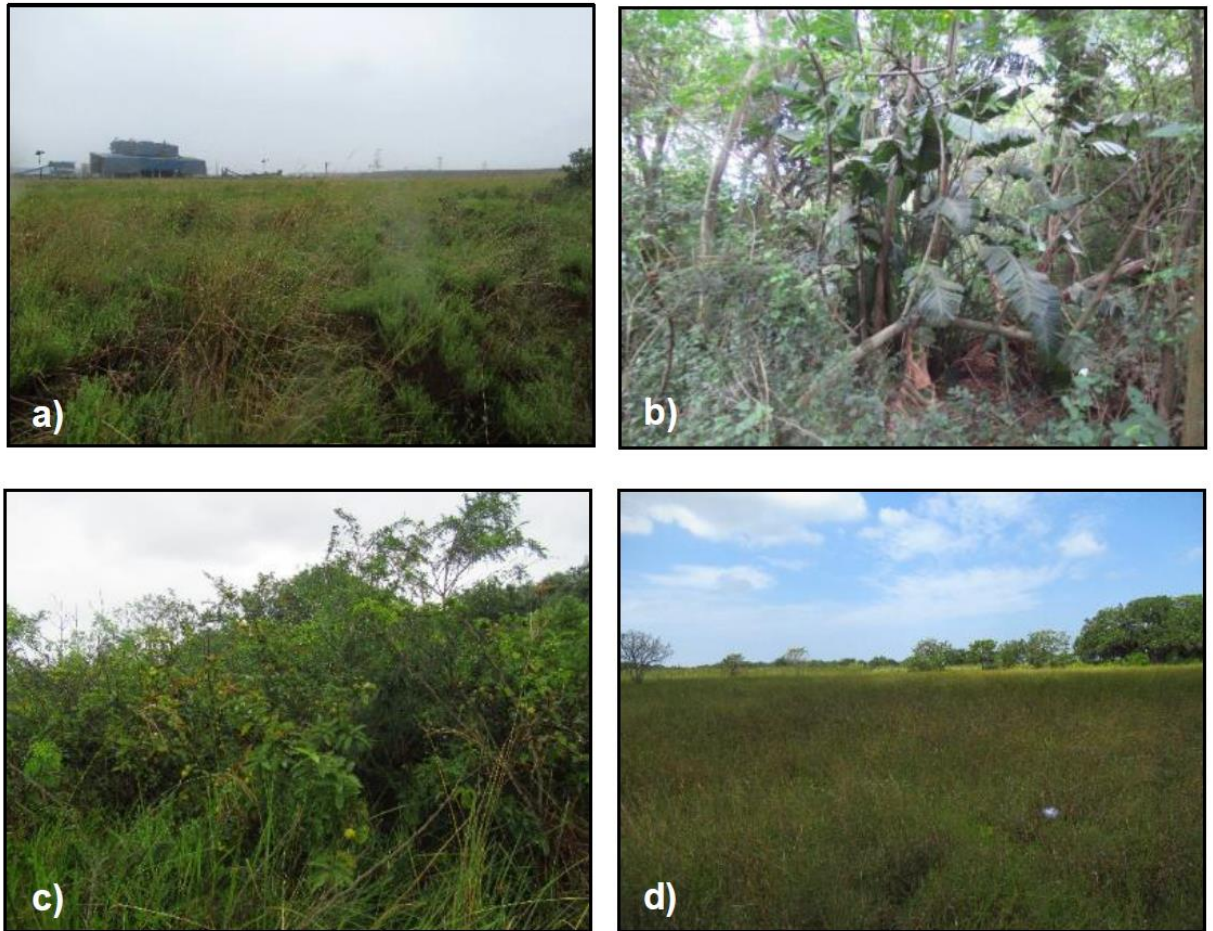


Figure 10-16: Photographs illustrating the typical habitat associated with the four main habitat units identified within the study area: a) Degraded Hygrophilous Grassland, b) Degraded Coastal Forest, Thicket Habitat, and d) Freshwater Habitat

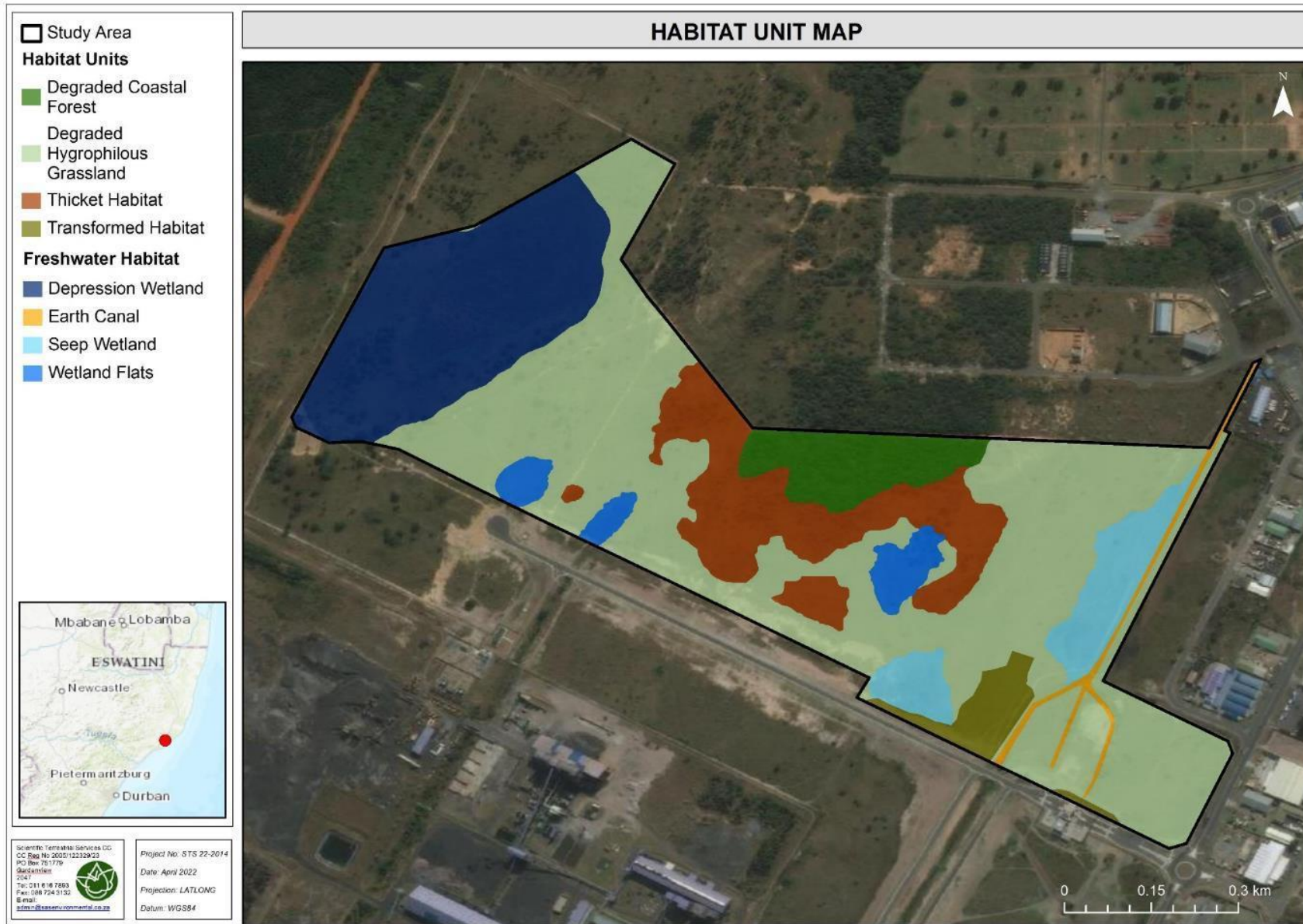


Figure 10-17: Conceptual illustration of the preliminary habitat units associated with the study area

10.13.3 Species of Conservation Concern (SCC)

The different habitats were characterised by different habitats and associated conditions. As such, each habitat provides different habitat for a variety of SCC. Table 2 and 3 below presents the preliminary floral and Faunal SCC assessments for the study area. Probability of Occurrence (POC; e.g., Confirmed, High, Medium or Low) is additionally provided as an indication of the likelihood of finding each species within the study area. It should be noted that permits from Ezemvelo KZN Wildlife and authorisation from the Department of Forestry, Fisheries, and the Environment (DFFE) will be required to remove, cut, or destroy any of the above-mentioned protected and/or threatened species before any vegetation clearing may take place.

It should be noted that during Phase 1F of the RBIDZ (refer to Nema Consulting (2016)), several SCC were identified within the study area (namely *Boophone disticha*, *Crinum macowanii*, *Eulophia speciosa*, and *Hypoxis hemerocallidea*). Necessary permits for the relocation of these species were applied for by the proponent at the responsible authorities. Subsequent permits for the relocation of the applicable SCC were approved and issued by the Ezemvelo KZN Wildlife Permits Office (permit reference: OP 836/2022) to the proponent. During the field assessment conducted by STS in April 2022, the permitted species were relocated (when located on site) to the desired location (as stipulated in the permit) in the northeast of the study area in which future infrastructure is not planned.

Table 10-1 provides a summary of the floral SCC Possibility of Occurrence (POC) within the study site.

Table 10-1: Floral SCC assessment (including PO) within the study area for various species

Habitat Unit	Protection status	Relevant Species	POC
Degraded Hygrophilous Grassland	RDL Species ¹⁶	None recorded during field assessment	Low
	KZNNCMA	<i>Crinum macowanii</i> (LC)	Confirmed
		<i>Disa woodii</i> (LC)	Confirmed
		<i>Boophone disticha</i> (LC)	High
		<i>Eulophia Speciosa</i> (LC)	High
	TOPs List	None recorded during field assessment	Low
NFA Trees	None recorded during field assessment	Low	
Degraded Coastal Forest	RDL Species	Sensitive species 1252 ¹⁷ (VU)	High
		<i>Cassipourea gummiflua</i> var. <i>verticillata</i> (VU).	Medium
	KZNNCMA	Orchidaceae Family	High
		<i>Sideroxylon inerme</i> (LC; also protected under NFA)	High
	TOPs List	None recorded during field assessment	Low
	NFA Trees	<i>Catha edulis</i> (LC)	High
<i>Pittosporum viridiflorum</i> (LC)		High	
<i>Sideroxylon inerme</i> (LC; also protected under KZNNCMA)		Medium	
Thicket Habitat	RDL Species	None recorded during field assessment	Low
	KZNNCMA	<i>Crinum macowanii</i> (LC)	Confirmed
		<i>Sideroxylon inerme</i> (LC; also protected under NFA)	Low
	TOPs List	None recorded during field assessment	Low
	NFA Trees	<i>Balanites maughamii</i> (LC)	Medium
		<i>Catha edulis</i> (LC)	Medium

Habitat Unit	Protection status	Relevant Species	POC
		<i>Sclerocarya birrea</i> subsp. <i>caffra</i> (LC)	Medium
		<i>Sideroxylon inerme</i> (LC; also protected under KZNNCMA)	Medium
Freshwater Habitat	RDL Species	<i>Fimbrisylis aphylla</i> (VU)	Medium
		<i>Thesium polygaloides</i> (VU)	Medium
	KZNNCMA	<i>Disa woodii</i> (LC)	Confirmed
	TOPS	None recorded during field assessment	Low
	NFA Trees	None recorded during field assessment	Low
Transformed Habitat	All	None recorded during field assessment	Low

Table 10-2: Faunal SCC assessment (including POC) within the study area for various species

Habitat Unit	Protection status	Relevant Species	POC
Degraded Hygrophilous Grassland	VU	<i>Circus ranivorus</i> (Marsh Harrier)	Medium
	NT	<i>Circaetus fasciolatus</i> (Southern Banded Snake Eagle)	Medium
	EN	<i>Hyperolius pickersgilli</i> (Pickersgill's Reed Frog)	Medium
	NT	<i>Hemisus guttatus</i> (Spotted Shovel nosed Frog)	Medium
Degraded Coastal Forest	VU	<i>Dendroaspis angusticeps</i> (Green Mamba)	Medium
	EN	<i>Hyperolius pickersgilli</i> (Pickersgill's Reed Frog)	Medium
	VU	Sensitive species 7	Low
	NT	<i>Circaetus fasciolatus</i> (Southern Banded Snake Eagle)	Medium
	VU	<i>Geokichla guttata</i> (Spotted-ground-thrush)	Medium
	VU	<i>Arytropteris basalis</i> (Flat-necked Shieldback)	Medium
	VU	<i>Pomatonota dregei</i> (East Coast Katydid)	Medium
Thicket Habitat	VU	<i>Geokichla guttata</i> (Spotted-ground-thrush)	Low
	VU	<i>Arytropteris basalis</i> (Flat-necked Shieldback)	Low
	EN	<i>Hyperolius pickersgilli</i> (Pickersgill's Reed Frog)	Low
	VU	<i>Dendroaspis angusticeps</i> (Green Mamba)	Medium
	VU	Sensitive species 7	Low
	NT	<i>Hemisus guttatus</i> (Spotted Shovel nosed Frog)	Medium
Freshwater Habitat	EN	<i>Hyperolius pickersgilli</i> (Pickersgill's Reed Frog)	High
	VU	<i>Circus ranivorus</i> (Marsh Harrier)	High
	NT	<i>Circaetus fasciolatus</i> (Southern Banded Snake Eagle)	Low
	LC	<i>Pelusios rhodesianus</i> (Variable Hinged Terrapin)	High
	EN	Sensitive species 1	Low
	LC but CITES	Sensitive species 2	Medium
	NT	<i>Hemisus guttatus</i> (Spotted Shovel nosed Frog)	High

10.13.4 Sensitivity

Figure 10-18 and Figure 10-19 conceptually illustrate the habitats considered to be of varying ecological sensitivity (from a floral and faunal perspective respectively) and how they will be impacted by the proposed infrastructure development.

The floral sensitivity is depicted according to the sensitivity of each habitat in terms of the presence or potential for floral SCC, habitat integrity and levels of disturbance, threat status of the habitat type, the presence of unique landscapes and overall levels of diversity (compared to a reference type). The faunal sensitivity is depicted according to the sensitivity of each habitat in terms of the presence or potential for faunal SCC, faunal diversity, food availability, habitat integrity, and habitat availability.

Table 10-1 provides an indication of the sensitivity associated with each habitat unit within the study area.

Table 10-3: Floral and faunal sensitivity associated with the habitats of the study area.

Habitat Unit	Floral Sensitivity	Faunal Sensitivity
Degraded Hygrophilous Grassland	Moderately Low	Intermediate
Degraded Coastal Forest	Moderately High	Moderately High
Thicket Habitat	Moderately Low	Intermediate
Freshwater Habitat: Depression Wetland	Moderately High	Moderately High
Freshwater Habitat: Wetland Flats & Earth Canal	Intermediate	Intermediate
Transformed Habitat	Low	Low

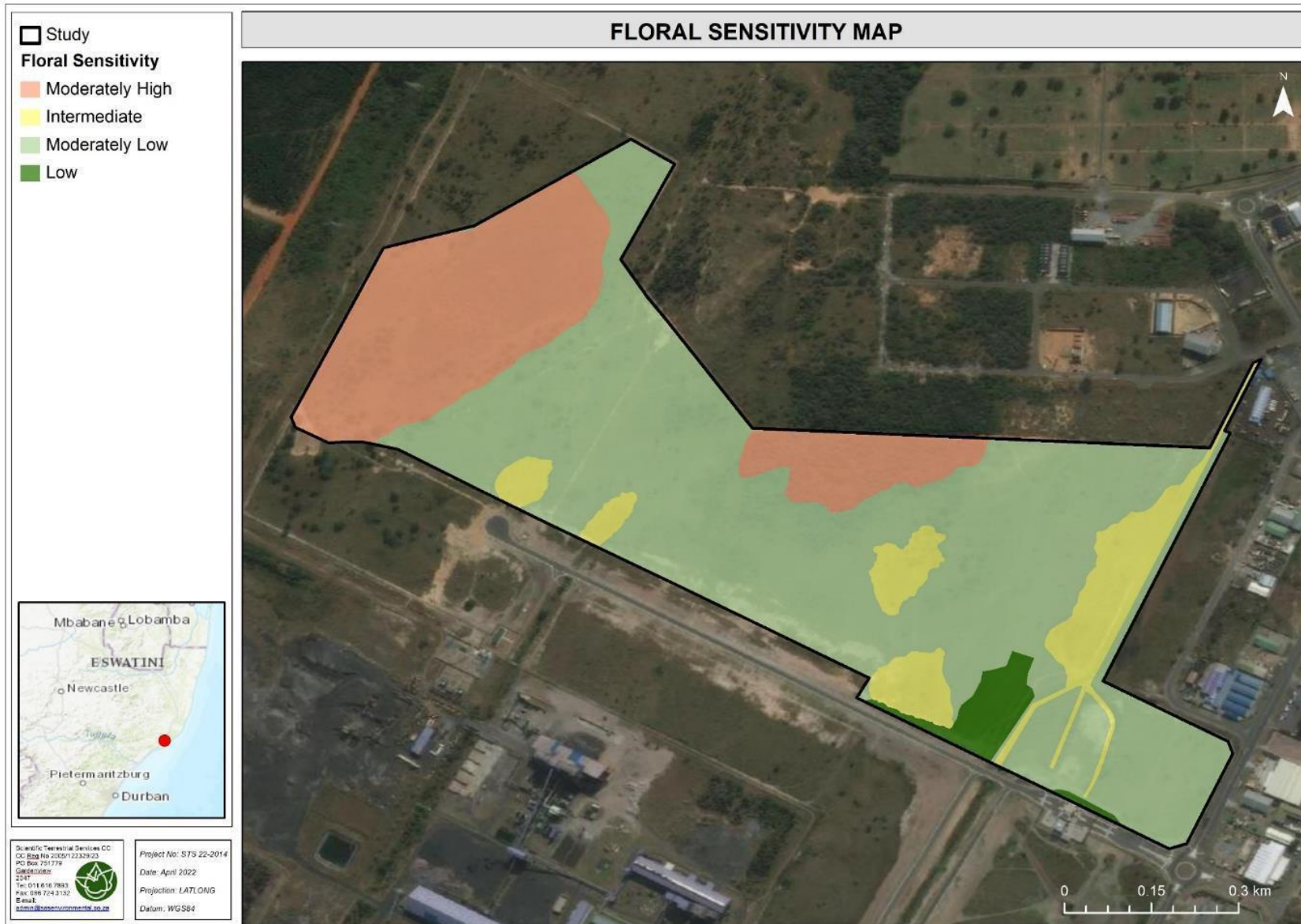


Figure 10-18: Conceptual illustration of the floral sensitivity associated with study area as identified during the field assessment

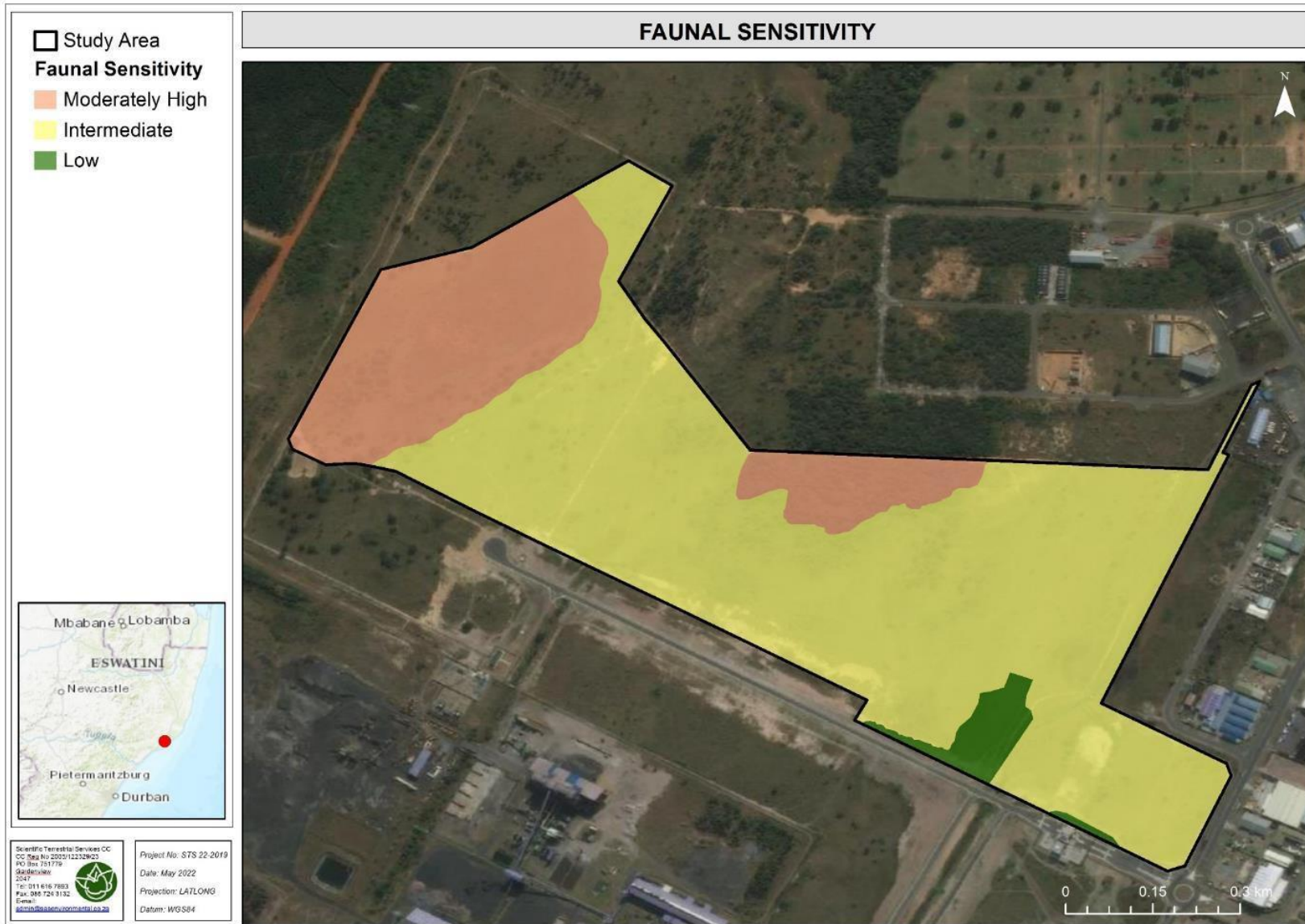


Figure 10-19: Conceptual illustration of the faunal sensitivity associated with study area as identified during the field assessment

10.14 Socio – Economic Environment

The City of uMhlathuze Local Municipality is the third most important area in KZN in terms of primary manufacturing of economic production. The City of uMhlathuze Local Municipality houses some of the world's industrial giants. The concentration of industries is supported by activities and output of important development nodes. Most of the commercial and industrial activities are located in Richards Bay, Empangeni, and Felixton.

The area is the third most important in KZN in terms of economic production which contributes 5.5% of total formal employment and 7.6% of the total gross geographic product. Port facility development has promoted and initiated the development of manufacturing activities through the years. The RBIDZ and nearby port are import assets that can exploit opportunities to export to the world's vast markets. Policies were created to encourage investment and promote industrial growth, prioritising projects on the basis of job creation contributions.

Interventions and strategies revolve around primary industrial development promotion, while creating entry into the market for Small, Medium and Micro Enterprises (SMMEs), the informal sector, and emerging businesses (City of uMhlathuze, 2022).

The local economy is imperative to national and international economies. A large number of importing and exporting industries like aluminium smelters, Richards Bay Minerals, Mondi Kraft, Exxaro KwaZulu-Natal Sands, Bell Equipment, Foskor, Richards Bay Coal Terminal, the port of Richards Bay, and cane and timber agricultural activity means that the region's welfare is influenced by national and international market movements. 95% of economic activities are located in Felixton, Empangeni, and Richards Bay.

The City of uMhlathuze Local Municipality consists of a population of approximately 410 465 people with 103 915 households (City of uMhlathuze, 2022). The highest levels of employment are among the employable youth (16 – 35 years). Unemployment levels are at 75.4%. This implies that the City of uMhlathuze Local Municipality has a high economic growth potential and should endeavour to speed up the provision and development of skill through initiatives. The current dependency ratio is 48.2, indicating high dependency from the youth on those that are economically active. The key issues are thus high unemployment rates, a lack of skills, and slow economic growth (City of uMhlathuze, 2022).

10.14.1 Unemployment

Even though there are high levels of unemployment, a large proportion of the uMhlathuze population is involved in informal activities. It should be noted that formal employment levels are not an indicator of the generation of income. Surplus produce from subsistence farming is quickly becoming important for the generation of income in the region. Employment levels are the highest in Wards 1, 2, 3, 9, 23, and 29. This largely correlates with the development of urban areas in Empangeni and Richards Bay (City of uMhlathuze, 2022).

Unemployment levels are the highest in Wards 6, 19, and 22. These largely correlate with developing areas on the urban periphery of Nseleni and Esikhaleni (City of uMhlathuze, 2022).

10.14.2 Education

In the City of uMhlathuze Local Municipality, adults with no schooling makes up 7.2%, adults with higher education makes up 7.3%, and adults with matriculation makes up 36.9% (City of uMhlathuze, 2022).

10.15 Heritage and Cultural Aspects

A cultural heritage survey was done in 2015 as part of the EIA for RBIDZ Phase 1F (NEMAI Consulting, 2016). This survey concluded that there are no heritage sites present at the RBIDZ. The surrounding area, however, relatively rich in archaeological sites and material may be exposed during construction. Attention is drawn to the South African Heritage Resources Act, 25 of 1999 and the KwaZulu-Natal Heritage Act, 4 of 2008, requiring operations that expose historical or archaeological remains to cease immediately, pending a provincial heritage agency evaluation.

Heritage information regarding Richards Bay was extracted for background purposes from the NEMAI EIA (NEMAI Consulting, 2016). Figure 10-20 indicates that the project site is not located within any World Heritage Sites.

The area of Richards Bays is relatively well surveyed in terms of heritage sites. The evidence available was captured in the Amafa KwaZulu-Natali and Natal Museum heritage site inventories. These inventories indicate that the Richards Bay area has a wide range of archaeological sites that cover different cultural traditions and time periods.

The archaeological sites range from the Early, Middle, and Later Stone Ages to the Early, Middle, and Later Iron Ages. Many of the sites that were recorded more recently occur along the dune cordon and slightly inland and were created mostly by Iron Age shellfish gatherers in the form of shell middens. Some of the stratigraphic layers may, however, extend back to the Later Stone Age.

The known Early Stone Age sites were speculated to date back to between 300 000 and 1.7 million years ago. Some of the stone tools were identified to belong to the Acheulian tradition and it is thus possible that early hominin like *Homo erectus* or *Homo ergaster* occupied these sites.

Sites from the Middle Stone Age date back to 40 000 to 200 000 BP. These relate to *Homo sapiens sapiens*. Most sites of the Middle Stone Age in the Maputaland area are open air stone tool scatters with little context regarding its archaeology. Some notable cave deposits do, however, occur like the world-renowned Border Cave Site, located about 65 km North of Ingwavuma.

The coastal zone's Early Iron Age in Maputaland contains ceramic fragments which belong to the Matola phase. Sites of the Matola phase can be identified with the first agriculturists, speaking Bantu that entered KwaZulu-Natal about 1 600 years ago from Eastern Africa. Sites from the Later Iron Age and evidence of iron smelting activities were recorded at the Mkuze Game Reserve.

Oral history indicates that the area was occupied by the Tembe-Thonga or their immediate ancestors in more recent times, but archaeological sites that belong to this period was not identified yet. Nonetheless, the area's present African inhabitants, the Swazi and Tembe Thonga, have a rich culture and oral history relating to their close relationship with the environment across many countries.

The view is that the historical Maputaland occupants, the Tembe-Thonga, migrated from Karanga in Zimbabwe in the middle of the seventh century. Portuguese sailor reports indicate that chief Tembe controlled the chiefdom in the Delagoa Bay hinterland in the mid-1600s. Tembe and his followers established their authority gradually in this hinterland, including the area immediately East of the study area.

The unity became upset in the mid-1700s when the chiefdom fragmented due to a split in the ruling lineage. This divide came after Silamboya's death in 1746. Descendants from Muhali, Silamboya's oldest son, settled West of the Maputo River and North of the Usuthu River. The group became known as the Mututwen-Tembe, the senior branch of the Tembe-Thonga. Other parts of the Tembe Thonga followed Mangobe, a junior son of Silamboya, and settled East of the Maputo River. This branch became known as the Maputo or Mabudu.

Early in the 1800s similar political centralisation processes took place amongst the Mthetwa, Ndwandwe, and Zulu chiefdoms southeast of Ingwavuma. The Zulu defeated the other groups and were established as the dominant power in south-east Africa. The Mabudu was not involved in war or attacked by the Zulu but were indirectly impacted by wars the Zulu waged in northern Zululand with various refugee groups passing through or settling in the Mabudu chiefdom during Shaka's reign.

The area was frequented by traders, hunters, and missionaries during the colonial period. Structures and sites associated with these activities, however, still needs to be identified. During the more recent past many Mozambique refugees cross the international border and settled in the region. Sites that belong to this era of history are protected by national heritage legislation as well and needs to be surveyed and recorded.

The HIA undertaken as part of the RBIDZ Phase 1F EIA found that there are no heritage resources located on the properties affected by the RBIDZ. A site specific HIA will be undertaken as part of the impact assessment phase of the Nyanza Project.

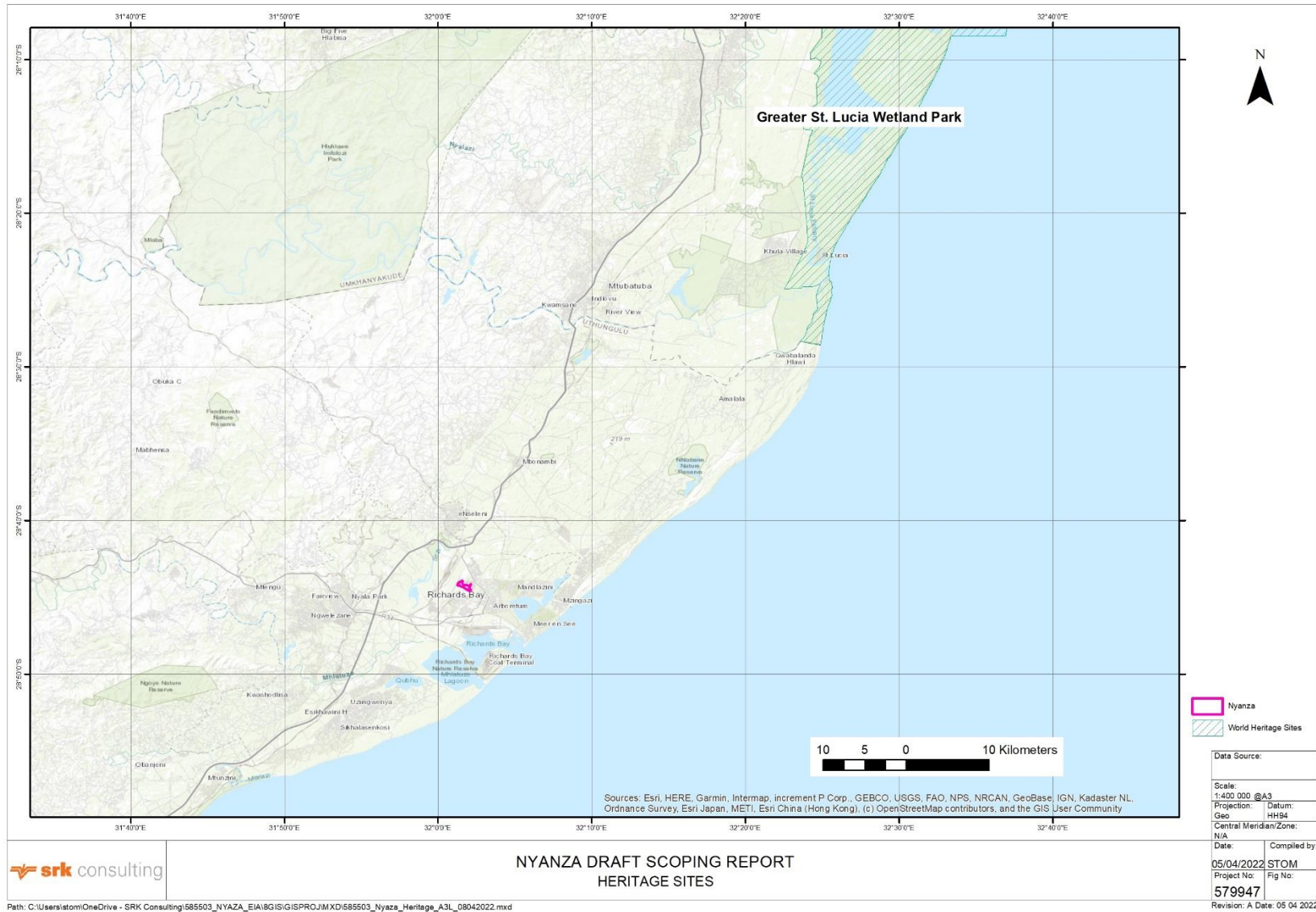


Figure 10-20: Heritage sites

10.16 Major Hazard Installations

The Occupational Health and Safety Act defines a Major Hazard Installation as

- (a) where more than the prescribed quantity of a substance is kept or maybe kept (The listed substances are provided in General Machinery Regulations Schedule A) and
- (b) where the substance is processed, produced, used, handled or stored which has the potential to cause a major incident.

To date, no neighbouring MHIs (current and planned) have been identified. SRK is however awaiting confirmation from the municipality. Should there be any MHIs located in the vicinity of the proposed plant, SRK will include an assessment of the potential impacts the proposed project may have on the MHIs in the impact phase of the process.

11 Plan of Study for the Environmental Impact Assessment

A full EIA process will be conducted for the proposed project, where an S&EIR and EMPr will be compiled and submitted to the KZN EDTEA and DFFE. A summary of the approach to be followed is provided in Figure 2-1.

This Plan of Study (PoS) for the EIA is provided to give an indication of further studies and assessments to be undertaken for the project and the impact assessment methodology that will be used to qualify and quantify the identified impacts.

The scoping process is designed to identify impacts and determine if these impacts are sufficiently significant to warrant a specialist investigation in the EIA Phase. Issues requiring further investigation require a common set of assessment criteria against which the impacts can be described, evaluated, and the significance determined.

11.1 Purpose of this Plan of Study

The purpose of the scoping Phase of this EIA process is to identify potential environmental impacts, and to discuss the alternatives considered. This PoS outlines the process to be followed during the course of the EIA and will be submitted to the KZN EDTEA and DFFE for review and comment as part of the Draft Scoping Report. The Draft Scoping Report, with the PoS will also be made available to all the stakeholders for review and comment. Comments received will be incorporated into the Final Scoping Report and PoS, which will be submitted to the KZN EDTEA and DFFE for approval. Depending on the responses received during the registration period, a public meeting or key stakeholder meetings may be held during the Scoping Phase of the project.

The purpose of the PoS is to lay out an effective methodology to be followed during the assessment of impacts, should this be deemed necessary, in order to meet the requirements of the NEMA.

11.2 Purpose of the EIA/EMPr

The objectives of the EIA/EMPr will be to:

- Identify and assess the environmental (biophysical, socio-economic, and cultural) impacts of the construction, operation, decommissioning and post closure impacts of the proposed project. The cumulative impacts of the proposed development will also be identified and evaluated;
- Identify and evaluate potential management and mitigation measures that will reduce the negative impacts of the proposed development and enhance the positive impacts;
- Compile monitoring, management, mitigation and training needs in the EMPr; and
- Provide the decision-making authorities with sufficient and accurate information in order to make a sound decision on the proposed development.

11.3 Methodology

This report presents the biophysical, socio-economic, and cultural impacts that have been identified and assessed at a scoping level.

A comprehensive and standardized methodology will be used to assess the environmental impacts during the impact assessment phase of the project. A plan will be prepared to mitigate and manage these impacts.

The EMPr will focus on the appropriate management of the proposed impacts resulting from the construction, operation and decommissioning of the proposed project.

11.4 Environmental Impact Assessment Report

Upon acceptance of the Final Scoping Report by the KZN EDTEA and DFFE, a Draft EIR and EMPr will be compiled in terms of Appendix 3 of GNR 326 promulgated in terms of the NEMA. The purpose of the impact assessment phase of this EIA process is to systematically assess the impacts of the proposed project on the immediate and surrounding biophysical and socio environment. All comments received on the Draft EIR will be addressed and taken into consideration prior to submission of the Final EIR to the KZN EDTEA and DFFE.

11.5 Environmental Management Programme

The EMPr will be compiled in accordance with Appendix 4 of GNR 326 of the NEMA. This will provide effective management and mitigation measure pertaining to the proposed development relating to the identified environmental impacts. Specialists will be required to develop management and monitoring plans in their respective areas of expertise, which will be incorporated into the EMPr. These management and mitigation measures will strive to minimise the negative impacts of the proposed development and enhance the positive impacts.

11.6 Stakeholder Engagement Going Forward

The stakeholder engagement process conducted thus far is provided in Section 8. The PoS for the proposed development should achieve the following:

- Describe the tasks that will be undertaken as part of the EIA/EMPr process, and the process followed in undertaking these tasks;
- Describe the authority consultation process and an indication when consultation will be conducted;
- Provide the assessment methodology used to assess the potential environmental impacts; and
- Provide an overview on the on-going I&AP consultation process.

11.6.1 Submission of Environmental Impact Assessment Report and Environmental Management Programme for Review

Upon acceptance of the Final Scoping Report by the KZN EDTEA and DFFE, a draft Environmental Impact Assessment Report (EIR) will be compiled in terms of Appendix 3 of GNR 326 promulgated in terms of the NEMA. The purpose of the impact assessment Phase of this EIA process is to systematically assess the impacts of the proposed project on the immediate and surrounding biophysical and socio environment.

The draft EIR and EMPr will be made available for a 30-day commenting period. Registered I&AP's will be notified of the availability of the draft EIR and EMPr Report through email, fax, SMS and posted registered letters. Depending on the responses received during the registration period, and where requested by the stakeholders, a public meeting and/or key stakeholder meetings may be held during the impact assessment phase of the project.

Where necessary, comments and issues raised by I&AP's during the commenting period will be consolidated into the Final EIR and EMPr with the relevant response issued by the EAP. The Final

EIR and EMPr will then be submitted to the KZN EDTEA and DFFE for decision making. The comments will also be collated into the CRR that will form an Appendix to the Final EIR.

11.6.2 Authority Consultation

Ongoing consultation with the different authorities will be conducted during the course of the EIA process. Further consultations with the competent authorities will be conducted should they become necessary. Authority consultation is considered an on-going process until a decision is made on the environmental application. Other authorities that will be included are the local and district municipalities, ward councillors, and others identified during the scoping phase of the project.

The EIA phase will only commence if the KZN EDTEA and DFFE accept the Scoping Report and the Plan of Study for the EIA.

Copies of the Draft EIA Report will be made available to the following key regulatory and commenting authorities:

- KZN EDTEA;
- King Cetshwayo District Municipality
- City of uMhlathuze Local Municipality
- uMhlathuze Water
- Department of Water and Sanitation
- Department Forestry, Fisheries and Environmental Affairs
- Department of Trade and Investment.

All other authorities will be e-mailed the report or a link to where the report can be sourced. Copies of the report will be made available upon request.

The final EIA Report will be submitted to the KZN EDTEA and DFFE for decision making.

For the remainder of the Scoping process and EIA, the interaction with KZN EDTEA and DFFE will be as follows:

- Submission of the Final Scoping Report;
- Addressing comments on the Scoping Report;
- Submission of the Draft EIA Report and EMPr;
- Addressing comments on the EIA Report and EMPr;
- Submission of the Final EIA Report and EMPr; and
- Obtaining a decision from KZN EDTEA and DFFE.

11.6.3 Consultation Post Decision

Once decisions on the EA and WML applications have been made, the EAP team will inform the I&APs of the decision through e mails, fax, SMS and notification letters. The notification will include information on the appeal process that the I&APs may go through should they wish the KZN EDTEA and/or DFFE decisions.

11.7 Alternatives

According to GNR 326 promulgated in term of the NEMA, feasible alternatives need to be considered and assessed during the scoping Phase of the project. During the scoping phase, the project

alternatives, including the no-go option have been identified and described in Section 6. All alternatives, including the no-go option will be subject to the impact assessment.

11.8 Specialist Studies

According to the DFFE Screening tool, the area is considered to be of very high agriculture, aquatic biodiversity and terrestrial biodiversity value. The results from the DFFE Screening Tool are summarised in Table 11-1.

Table 11-1: DFFE Screening Tool Results

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme	X			
Animal Species Theme		X		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				X
Civil Aviation Theme		X		
Defence Theme				X
Palaeontology Theme				X
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

The following site-specific specialist studies will be conducted during the impact assessment phase:

- Terrestrial Biodiversity Impact Assessment;
- Aquatic Biodiversity Impact Assessment;
- Soils and Land Use Capability;
- Air Quality Impact Assessment;
- Noise Impact Assessment;
- Hydrology and Stormwater Management;
- Geotechnical;
- Traffic Impact Assessment;
- Hydropedology;
- Geohydrology Impact Assessment; and
- Heritage Impact Assessment.

The generic terms of reference (ToR) for each specialist study are to:

- Describe the existing baseline characteristics of the study area and place this in a regional context;
- Identify and assess potential impacts resulting from the project (including impacts associated with the construction and operation of the project), using SRK's prescribed impact rating methodology;
- Identify and describe potential cumulative impacts resulting from the proposed development in relation to proposed and existing developments in the surrounding area;

- Recommend mitigation measures to avoid or minimise impacts and/or optimise benefits associated with the proposed project; and
- Recommend and draft a monitoring programme, if applicable.

Other specialist studies including Air Quality, Noise, Hydrology and Groundwater will require modelling.

Certain impacts that are anticipated to be of limited or lower significance, either by virtue of the scale of the impacts, their short duration (e.g., construction phase only), disturbed nature of the receiving environment and/or distance to communities, will be assessed by EAP Team and reported directly into the EIA Report.

11.9 Impact Assessment Methodology

A quantitative impact assessment will be conducted for the project. The method to be used makes use of the basic risk assessment approach of deriving an expression for risk from the product of likelihood (probability) and consequences.

The main objective of the impact assessment is to identify the impacts that can be avoided and/or mitigated and the benefits of the positive impacts during the planning, construction, operation and decommissioning and rehabilitation phases of the proposed project on the receiving environment.

11.9.1 Impact Identification

Specialists will be required to identify impacts (positive and negative) associated with the project, then further specify whether the impact would have a direct/indirect effect. An assessment of the *cumulative* and *residual* impacts if any, that may occur because of the proposed project are also evaluated.

11.9.2 Impact Assessment Methodology

The anticipated impacts associated with the proposed project will be assessed according to SRK's standardised impact assessment methodology, which is presented below. This methodology has been utilised for the assessment of environmental impacts where the consequence (extent, intensity, and duration of the impact) and probability of the impact have been considered in parallel to provide an impact rating and hence an interpretation in terms of the level of environmental management required for each impact as follows:

The **significance** of an impact is defined as a combination of the **consequence** of the impact occurring, including possible irreversibility of impacts and/or loss of irreplaceable resources, and the **probability** that the impact will occur.

The criteria used to determine impact consequence are presented in Table 11-2.

Table 11-2: Criteria used to determine the Consequence of the Impact

Rating	Definition of Rating	Score
A. Extent – the area over which the impact will be experienced		
Local	Confined to project or study area or part thereof (e.g. site)	1
Regional	The region, which may be defined in various ways, e.g. cadastral, catchment, topographic	2
(Inter) national	Nationally or beyond	3
B. Intensity – the magnitude of the impact in relation to the sensitivity of the receiving environment, taking into account the degree to which the impact may cause irreplaceable loss of resources		
Low	Site-specific and wider natural and/or social functions and processes are negligibly altered	1

Rating	Definition of Rating	Score
Medium	Site-specific and wider natural and/or social functions and processes continue albeit in a modified way	2
High	Site-specific and wider natural and/or social functions or processes are severely altered and/or irreplaceable resources ⁶ are lost	3
C. Duration – the timeframe over which the impact will be reversed		
Short-term	Up to 2 years	1
Medium-term	2 to 15 years	2
Long-term	More than 15 years or irreversible	3

The combined score of these three criteria corresponds to a **Consequence Rating**, as provided in Table 11-3.

Table 11-3: Method used to determine the Consequence Score

Combined Score (A+B+C)	3 – 4	5	6	7	8 – 9
Consequence Rating	Very low	Low	Medium	High	Very high

Once the consequence is derived, the probability of the impact occurring is considered using the probability classifications presented in Table 11-4.

Table 11-4: Probability Classification

Probability – the likelihood of the impact occurring	
Improbable	< 40% chance of occurring
Possible	40% - 70% chance of occurring
Probable	> 70% - 90% chance of occurring
Definite	> 90% chance of occurring

The overall **significance** of impacts is then determined by considering consequence and probability using the rating system prescribed in Table 11-5.

Table 11-5: Impact significance ratings

		Probability			
		Improbable	Possible	Probable	Definite
Consequence	Very Low	INSIGNIFICANT	INSIGNIFICANT	VERY LOW	VERY LOW
	Low	VERY LOW	VERY LOW	LOW	LOW
	Medium	LOW	LOW	MEDIUM	MEDIUM
	High	MEDIUM	MEDIUM	HIGH	HIGH
	Very High	HIGH	HIGH	VERY HIGH	VERY HIGH

Finally the impacts will also be considered in terms of their status (positive or negative impact) and the confidence in the ascribed impact significance rating. The prescribed system for considering impacts status and confidence (in assessment) is laid out in Table 11-6.

Table 11-6: Impact status and confidence classification

⁶ Defined as important cultural or biological resource which occur nowhere else, and for which there are no substitutes.

Status of impact	
Indication whether the impact is adverse (negative) or beneficial (positive).	+ ve (positive – a 'benefit')
	– ve (negative – a 'cost')
Confidence of assessment	
The degree of confidence in predictions based on available information, SRK's judgment and/or specialist knowledge.	Low
	Medium
	High

SRK recommends that the impact significance rating should be considered by authorities in their decision-making process based on the implications of ratings ascribed below:

- **INSIGNIFICANT:** the potential impact is negligible and **will not** have an influence on the decision regarding the proposed activity/development.
- **VERY LOW:** the potential impact is very small and **should not** have any meaningful influence on the decision regarding the proposed activity/development.
- **LOW:** the potential impact **may not** have any meaningful influence on the decision regarding the proposed activity/development.
- **MEDIUM:** the potential impact **should** influence the decision regarding the proposed activity/development.
- **HIGH:** the potential impact **will** affect the decision regarding the proposed activity/development.
- **VERY HIGH:** The proposed activity should only be approved under special circumstances.

In the report, practicable mitigation and optimisation measures will be recommended and impacts rated in the prescribed way both without and with the assumed effective implementation of essential mitigation and optimisation measures. Mitigation and optimisation measures will be either:

- **Essential:** best practice measures which must be implemented and are non-negotiable; and
- **Best Practice:** recommended to comply with best practice, with adoption dependent on the proponent's risk profile and commitment to adhere to best practice, and which must be shown to have been considered and sound reasons provided by the applicant if not implemented.

12 Anticipated Environmental, Social, and Cultural Impacts

The scoping phase aims to identify the potential positive and negative biophysical, socio-economic, and cultural impacts that the proposed project. Anticipated impacts that have been identified by the project team are provided in Table 12-1.

All impacts in terms of construction, operation, and decommissioning together with the recommended mitigation measures will be and addressed in the impact assessment phase of the project.

Table 12-1: Summary of potential environmental impacts associated with the proposed development

Element of Environment	Potential Impact Descriptions
Socio-Economic	Possible job and business opportunities during all phases of the project.
Hydrogeology	Possible groundwater contamination from hydrocarbons leaking from construction vehicles, chemicals and materials handled on site.
Surface water	Possible surface water contamination from hydrocarbons leaking from construction vehicles, chemicals and materials handled on site.
Air Quality	Possible impact on air quality in the area.
Noise	Possible generation of noise during the construction, operation, and decommissioning of the 80 000 tpa TiO ₂ Pigment Plant.
Heritage Resources	Possible impact on heritage resources.
Visual	Possible visual impacts due to the construction and operation of the plant
Soils/Land Use/Land Capability	Localised loss of soil resource and change in land capability and land use due to the clearance of vegetation is expected.
Traffic	Possible impacts on traffic due to transportation of construction material
Biodiversity	Loss of biodiversity due to vegetation clearance for construction.
Aquatic Biodiversity Impact Assessment	Possible impacts on the wetlands on the project site.
Traffic	Possible impact on traffic during all phases of the project

12.1 Socio Economic

The development of the 80 000 tpa TiO₂ Pigment Plant will have positive impact on the socio-economy. This project will bring new technology to South Africa as well, aid the industrialisation programme of the government, and add value to mineral and mining processing value chain of the country (Global Africa Network, 2017).

Commencing with the construction of investment projects and the persistent partnership between Nyanza and the RBIDZ, will contribute to stimulating and restoring the KZN economy as well as the national economy (ZO, 2021).

It is expected that the project will lead to the creation of about 1 200 jobs during its construction phase and 550 job during its operational phase. Approximately 680 of these jobs will be for skilled labourers, while 1 070 of these jobs will be for unskilled labourers. People from the Richards Bay area will be preferably employed as this will be the most economically viable option. Should the project not proceed, a large negative socio-economic loss will be a consequence for the region.

The EIA team will include a socio-economic impact assessment and statement in the EIR and will provide management and mitigations measure to prevent and/or minimise the any negative social impacts that may be associated with the proposed project.

12.2 Hydrogeology

The construction and operational phases of the project may result in the possible contamination of groundwater from hydrocarbons leaking from vehicles and machinery used in the construction and operational phases to transport material. Additional impacts may result from inappropriate handling and storage of material and chemicals required for the operation of the plant. In appropriate waste management practises can also result in groundwater contamination.

A geo-hydrological specialist assessment will be conducted for the proposed project to determine the possible impacts and applicable mitigation and management measures which will be incorporated into the EMPr.

12.3 Surface water

The following possible impacts on the surface water resources are envisaged:

- Reduced water quality as a result of possible hydrocarbon spills;
- Siltation of watercourses as a result of cleared areas and erosion;
- Incorrect separation of clean and dirty water; and
- Leaching of contaminated ground water into water resources.

The EIR will include an assessment of the likelihood and significance of the impacts of the 80 000 tpa TiO₂ Pigment Plant on the hydrology of the area, as well as the management and mitigation measures required to minimise the impacts. A hydrologist will compile a Stormwater Management Plan (SWMP) that will be integrated into the overall Site Waste Management Plan (SWMP) to ensure that stormwater from the proposed facility is properly managed.

In addition, a water management plan will be compiled, that will be incorporated into the EMPr and will include a surface water monitoring plan.

12.4 Air Quality

The proposed project may result in air quality impacts due to vehicle emissions and dust emissions during construction. The impact will be short term and will be greatly reduced during the operational phase of the project.

The operation of the 80 000 tpa TiO₂ Pigment Plant may result in air quality impacts, including dust emissions from the plant due to the handling of the slag feedstock. A summary for the identified gases to be emitted from the plant is provided in

Table 12-2: Summary of Gaseous Emissions

Description	Comment
Scrubbed calciner off-gas	Discharged through 2 x stacks
Dryer off-gas	Discharged through 2 x vent pipes
WAC off-gas	Discharged through 2 x vent pipes
Concentrator off-gas	Discharged through 2 x vent pipes
Scrubbed digester off-gas	Discharged through 5 x stacks
Dryer off-gas	Discharged through 2 x vent pipes
Copperas extraction off-gas	Discharged through 2 x vent pipes
WAN off-gas	Vented from individual tanks to atmosphere
TiOCl ₂ off-gas	Discharged through vent pipe
Hydrolysis vent gas	Vented from individual tanks to atmosphere

Description	Comment
Bleach vent gas	Vented from individual tanks to atmosphere
Nuclei off-gas	Discharged through vent pipe

An Air Quality Impact Assessment will be undertaken by a specialist which will include an assessment of the baseline ambient air quality using data from the nearest offsite air quality monitoring stations and modelling of air dispersion in CALPUFF for pollutants associated with the proposed plant. The specialist will identify mitigation measures that Nyanza will be required to implement to minimise the impacts of the proposed project on air quality in the area.

12.5 Noise

It is expected that noise will be generated from the movement of vehicles and the use of heavy equipment during the construction and operational phases of the project. Due to the existing activities associated with the RBIDZ it is expected that the noise associated with the 80 000 tpa TiO₂ Pigment Plant will mostly be masked by the noise already existing on site as a result of the other activities.

A noise impact assessment (specialist study) will be undertaken, which will include a noise baseline assessment, ambient environmental acoustic monitoring, acoustic modelling results and impacts, as well as detailed recommendations, including mitigation measures and ongoing noise monitoring if deemed necessary.

12.6 Heritage

A heritage study undertaken as part of RBIDZ Zone 1F EIA undertaken by Active Heritage CC found that there were no heritage resources of cultural significance within the IDZ. However, due to the nature of heritage resources, there is a chance that some resources may have been missed during the site surveys and literature reviews. A site-specific phase 1 heritage resources assessment will be undertaken as part of the EIA process. Findings from the study will be incorporated into the EIR and mitigation measures, including chance finds protocol will be incorporated into the EMPr.

12.7 Visual

Due to current operations surrounding the project site, it is expected that the 80 000 tpa TiO₂ Pigment Plant will not result in any significant additional visual impacts.

During the construction phase, clearing of vegetation and the presence of construction vehicles and equipment may result in visual intrusion and impact on sense of place. There is also a possibility of indirect visual impact due to dust generation as a result of the movement of vehicles and materials, to and from the site area. This will be short lived and is expected to be of low significance, considering the activities already taking place in the vicinity of the project site.

Due to current operations at the RBIDZ and surrounding industrial developments, in close vicinity to the proposed plant location, it is expected that the operation of the plant will not result in any significant additional visual impacts. A visual impact assessment will be undertaken during the impact assessment phase and will include mitigation measures that Nyanza will be required to implement to minimise the significance of the impacts. The EMPr to be compiled for the proposed project will provide for practical mitigation measures that may be implemented to avoid and/or minimise the impacts.

12.8 Soils, Land Use, and Land Capability

It is expected that during the construction phase, the proposed project will have short lived, low significance impacts on soils, land use, and land capability as follows:

- Movement of construction vehicles, machinery and workers in unprotected areas (bare) may result in compacting of the soil;
- Clearing of vegetation will result in the soils being particularly more vulnerable to soil erosion. The impact can persist long after cessation of construction activities depending on mitigation and rehabilitation strategies. The strategic SWMP being compiled for the facility will ensure that soil losses are minimised;
- Soil contamination as a result of construction activities can be as a result of a number of activities (i.e., incorrect hazardous substance storage and incidental hydrocarbon leakages from construction vehicles);
- Loss of soil resource and utilisation as a result of the cleaning and topsoil stripping of the construction footprint. Although soils will be stripped and stockpiled, loss of seed reserve and organic matter depletion through decomposition during stockpiling will reduce soil quality and its ecological function if not managed appropriately; and
- In areas of permanent changes where the infrastructure will be permanently located, the current land capability and land use will be lost permanently. This will however be localised to the footprint of the infrastructure.

The impacts on soils, land use, and land capability will be localised to the project footprint. A soil, land use, and land capability impact assessment will be conducted, and mitigation and management measures will be included in the EIR and EMP.

12.9 Traffic

Although trips can be optimised, transportation of material during the construction and operational phase will result in increased traffic count in the area.

A Traffic Impact Assessment will be undertaken during the impact assessment phase and will include the quantification of possible traffic impacts and mitigation measures that can be implemented to reduce the significance of the impacts.

12.10 Biodiversity

Potential preliminary biodiversity impacts identified include:

12.10.1 Flora

The project may result in the following impacts on the floral environment during the construction phase:

- Destruction of potential floral habitats for SCC as a result of site clearing, alien species, waste management and soil compaction;
- Vegetation clearance may lead to floral habitat loss of potential SCC;
- Impact on floral diversity as a result of site clearance, anthropogenic activity, and possible uncontrolled fires;
- Potential proliferation of alien invasive species as a result of floral disturbance;
- Generation of waste and incorrect disposal from construction material leading to disturbance of natural vegetation; and
- Habitat fragmentation as a result of construction activities of the access roads leading to loss of floral diversity.

12.10.2 Fauna

The project may result in the following impacts on the faunal environment during the construction phase:

- Loss of faunal habitat and ecological structure as a result of site clearing, alien invasive species, erosion, and general construction activities;
- Loss of faunal species due to collisions with construction vehicles and machinery;
- Loss of faunal diversity and ecological integrity as a result of construction activities, erosion, poaching and faunal specie trapping;
- Impact on faunal species of conservational concern due to habitat loss and collision with construction vehicles; and
- Failure to initiate a rehabilitation plan and alien control plan during the construction phase may lead to further impacts on faunal habitat during the operation phase.

A Terrestrial Biodiversity Impact Assessment will be undertaken by a specialist during the impact assessment phase of the process. The full impact assessment conducted by the specialist will be included in the EIR and EMPr.

12.11 Wetlands and Aquatic Biodiversity

Three wetlands were identified in the area during the RBIDZ EIA. According to the EA issued to the RBIDZ, the following measures would apply:

- Development of, as well as interference with, the functional and healthy wetland of Area A should be avoided in its entirety;
- Development of Area B is deemed generally unacceptable, due to the level of ecosystem functions it provides. However, development / in-filling of a portion of the wetland may be approved by the competent authority should a compelling and/or persuasive motivation be provided in relation to the socio-economic implications of the proposed development and should effective mitigation measures be proposed and approved; and
- Two options were considered for the potential development of Area C, the preferred developable wetland area, namely the development in the upper northern portion of the system only; or the development of the entire unit. The EA issued to the RBIDZ (Ref 14/12/16/3/3/2/665) authorised the development of the entire unit.

Possible sedimentation and contamination of no-go wetlands (Wetland unit A and associated 30m buffer and portions of Wetland Unit B that are not meant to be infilled) may occur. The removal of vegetation from the construction area and uncontrolled access to Wetland unit A and associated 30m buffer and portions of Wetland Unit B that are not meant to be infilled is also expected to have an impact on the provision of ecological and sociocultural services by aquatic ecosystems and wetlands. In addition, construction waste disposal and oil leakages from construction vehicles will alter biodiversity maintenance of the aquatic ecosystems and wetlands, which endangers the survival of aquatic ecosystem and riparian species inhabiting the area.

Impacts on the aquatic ecosystems and wetlands will include:

- Loss of habitat and aquatic ecosystem and wetland ecological structure as a result of site clearance activities and uncontrolled aquatic ecosystem and wetland habitat degradation;
- Loss of floral SCC that may be located in wetland areas;

- Impact on the aquatic ecosystem and wetland systems as a result of changes to the sociocultural service provisions through site clearance, waste management and disturbance;
- Impact on the hydrological functioning of the aquatic ecosystem and wetland systems;
- Vegetation clearance may result in soil erosion which will result in sedimentation of wetland areas;
- Soil compaction and levelling as a result of construction activities and vehicle movement leading to loss of wetland habitat; and
- Increased runoff due to topsoil removal and vegetation clearance leading to possible erosion and sedimentation of wetland resources.

12.12 Waste Management

Poor waste management practices will result in:

- Contamination of surface runoff resulting in the deterioration of water quality of the water resources and wetlands; and
- Storage of HSS, considered a hazardous waste and disposal of other hazardous waste including hydrocarbon contaminated soils, rags etc. could result in the contamination of surface runoff resulting in the deterioration of water quality of the water resources and wetlands.

A waste management plan will be compiled during the impact assessment phase of the project and will be incorporated into the project EMP.

12.13 Cumulative impacts

Incomparable activities can result in several complex effects on the natural biophysical and social environment. These impacts are mainly identified as direct and immediate effects on the environment by a single entity affecting a variable of the environment. These direct impacts have the potential to combine and interact with other activities, depending on the surrounding environmental state and land use. These impacts may aggregate or interact with other impacts to cause additional effects, not easily quantified when assessing an individual entity.

The NEMA EIA Regulation of 2014, as amended in 2021 specifically requires that cumulative impacts be assessed. The impact assessment phase will include a description and analysis of the potential cumulative effects of the proposed 80 000 tpa TiO₂ Pigment Plant, and past and present projects hereby considering the effects of any changes on the:

- Biophysical; and
- Socio-economic conditions.

The following potential preliminary cumulative impacts have been identified based on the project description and past studies:

- Clearance of vegetation and potential loss of habitat due to the development of the plant
- Soil erosion due to cleared areas within an area already previously disturbed
- Emissions due to construction and operational equipment and machinery, adding to overall ambient air quality
- Increased influx of job seekers to the general area as a result of the construction activities of the plant

- The construction period may cause traffic-related impacts on the local road network.

The EAP team and specialists will identify significant past and present projects and activities that may interact with the project to produce cumulative impacts during the impact assessment phase of the process. The EAP team and specialists will include mitigation and management measures in the EMP that Nyanza will be required to implement to, where possible, avoid the negative impact and/or minimise the significance of the impacts.

12.14 Mitigation Measures

Preliminary high level mitigation measures have been identified and summarised in Table 12-3. Specific mitigation measures will be identified during the impact assessment phase of the process. The potential impacts identified will be assessed during the impact assessment phase of the process. Specialist studies will be undertaken, and the specialists will identify the required mitigation measures that Nyanza must implement to reduce the significance of the identified impacts.

Table 12-3: Preliminary High Level Mitigation Measures

Project Phase	Environmental Aspect	Potential Impacts	Preliminary High Level Mitigation Measures
Construction	Geology	Excavation for plant foundation can lead to erosion	<ul style="list-style-type: none"> Rehabilitate all exposed earth promptly with suitable vegetation to stabilize the soil.
	Soils	Soil erosion, compaction and contamination.	<ul style="list-style-type: none"> Rehabilitate all exposed earth promptly with suitable vegetation to stabilize the soil. Construction vehicles to be restricted to approved areas and roads within the site. Oil spills to be cleaned up immediately.
	Vegetation and Wetlands	<ul style="list-style-type: none"> Loss of vegetation and terrestrial habitat Loss of wetland / riparian habitat Potential loss of Species of Conservation Concern Sedimentation and erosion Infestation of alien species 	<p>Loss of Vegetation and Terrestrial Habitat</p> <ul style="list-style-type: none"> No indigenous vegetation may be collected or used for firewood. Where construction occurs close to the sensitive areas of natural vegetation or any plants of high conservation value, these must be suitably and visibly demarcated and cordoned off by the Environmental Control Officer (ECO) prior to, and during the construction phase. Should any SCC be located on the site, a plant 'rescue' operation must be undertaken under the direction of an ecologist / botanist prior to construction, where plants of high conservation value will be impacted by any part of the development. These should be carefully transplanted to a suitable site nearby and watered until established. Where clearing is required outside of earthwork / construction areas, vegetation should be brush-cut rather than cleared to speed re-establishment following site closure. <p>Loss of Wetland / Riparian Habitat</p> <ul style="list-style-type: none"> The development footprint should be kept to minimum to minimise impacts on wetlands. Construction activities within the wetland should take place during the dry season, where possible. Excavated soils should be placed on the upslope side, minimizing the risk of erosion and excess sediment entering the freshwater ecosystems. No vegetation clearing or earth moving activities to occur in the wetlands, outside of the development site. No rubble may be temporarily stockpiled or dumped within the wetlands. Implement mitigation measures recommended by the site-specific wetlands assessment that will be undertaken in the impact assessment phase of the process. In addition, mitigations recommended in the Wetland Rehabilitation Plan (RHDHV, 2016) must be implemented. A portion of the 40% Floor Area Ratio (FAR) of the full Nyanza area should be 'spent' on conservation of the portion of wetland. <p>Loss of Species of Conservation Concern</p>

Project Phase	Environmental Aspect	Potential Impacts	Preliminary High Level Mitigation Measures
			<ul style="list-style-type: none"> • Undertake a ‘Search and Rescue’ operation within the Nyanza development site prior to construction within the flowering season of the protected species to ascertain their presence. • The necessary permit applications must be obtained in terms of the DAFF, NEM:BA, KZN Nature Conservation Ordinance and KZN Nature Conservation Act, prior to the removal of any of these species. <p>Sedimentation and Erosion</p> <ul style="list-style-type: none"> • Erosion control structures must be put in place where soil may be prone to erosion. • Topsoil and subsoil should be stockpiled separately, to not impact on areas outside the project site. • Topsoil storage should not exceed a height of 2 m. • During rehabilitation, prompt and progressive reinstatement of bare areas is required. The topsoil layer is to be replaced on top during reinstatement. • The control of soil erosion and siltation associated with construction and operation is important at all locations on site, and particularly adjacent to wetlands. Both temporary and permanent soil erosion control measures must be used during the construction and operation phases. Any earth-worked areas, which may lay bare for extended periods, should be temporarily grassed. • Checks must be carried out at regular intervals to identify areas where erosion is occurring. • Remedial action, including the rehabilitation of eroded areas and, where necessary, the relocation of the paths causing erosion, is to be undertaken. • Large sediment loads must be prevented from entering watercourses. <p>Proliferation of Alien Invasive Species</p> <ul style="list-style-type: none"> • Natural open spaces outside the development footprint should be left in their undeveloped state. • Any existing or new exotic vegetation within the proposed development site must be eradicated. • A monitoring program should be put in place to remove exotic vegetation and maintain areas free from exotic invasions during construction. • Within, and in proximity to the wetland, successful re-vegetation, if required, is crucial to stabilise soils and limit infestation by invasive alien plant species. Rehabilitation should be undertaken on a progressive basis in these areas.
	Fauna	<ul style="list-style-type: none"> • Destruction of natural habitat for wildlife • Killing of wildlife 	<ul style="list-style-type: none"> • Throughout the lifetime of construction and operations, nobody may capture, trap, hunt or kill any wild animal in the study area. • Pesticides should also be discouraged from use during the construction phase of the development.

Project Phase	Environmental Aspect	Potential Impacts	Preliminary High Level Mitigation Measures
	Surface and Groundwater	<ul style="list-style-type: none"> Creation of impermeable / hardened surfaces will cause changes in the surface flow quantity and quality Materials such as oils and grease from on-site machinery exposed to the soil could infiltrate the ground resulting in ground water contamination 	<ul style="list-style-type: none"> Bare areas where vegetation has been removed pose a risk of becoming a sediment load into wetland areas and must therefore be effectively managed for prevention. Temporary stormwater management structures should be used during construction. Any areas damaged as a result of stormwater runoff from the construction site must be rehabilitated immediately. Extra care must be taken to prevent any potentially hazardous substances from entering the wetlands during heavy rainfall events. The use of all chemicals and potentially hazardous substances must take place on a tray or an impermeable surface. All rubble and other types of waste must be disposed at a licensed waste disposal site to prevent it from entering the watercourses. In the event of the spilling of chemicals and potentially hazardous substances, this must be addressed immediately and reported to the relevant authority. All construction machinery to be serviced regularly and maintained,
	Heritage and Cultural	Damage to heritage resources through construction activities (chance find)	<ul style="list-style-type: none"> If any potential items of cultural or archaeological importance are found during excavation for the plant's foundations, all work to be stopped until all clear has been given by a registered cultural heritage practitioner. A chance find protocol must be implemented should any heritage resources be found during construction.
	Air Quality	<ul style="list-style-type: none"> Dust from bare areas that have been cleared for construction purposes Emissions from construction vehicles and equipment 	<ul style="list-style-type: none"> Compliance with the Air Quality Management Plan that will be developed as part of the Air Quality Impact Assessment. Implementation of reporting procedures that will be developed as part of the Air Quality Impact Assessment. Reduction of fugitive PM emissions using screens such as netting. Dust suppression measures must be implemented on open areas / topsoil stockpiles. Reductions of vehicle exhaust emissions by ensuring equipment is in good working order. Implementation of design mitigation measures. Source (off-gases) and dustfall (particulates) monitoring. A monitoring programmes will be developed as part of the Air Quality Impact Assessment.
	Noise	<ul style="list-style-type: none"> Noise generated from construction machinery and vehicles General activities associated with construction 	<ul style="list-style-type: none"> Construction to be limited to daylight hours. All construction machinery to be serviced regularly and maintained to ensure that noise levels are kept to a minimum. Implement mitigation measures that will be developed during the Noise Impact Assessment. Noise monitoring per the outcomes and requirements of the Noise Impact Assessment to be undertaken during the impact assessment phase.

Project Phase	Environmental Aspect	Potential Impacts	Preliminary High Level Mitigation Measures
	Visual	<ul style="list-style-type: none"> Litter and bad housekeeping due to construction staff Clearing of vegetation Inadequate rehabilitation of the construction footprint 	<ul style="list-style-type: none"> Areas to be revegetated as soon as construction has been completed. Regular audits to be undertaken to ensure basic housekeeping is taking place at the construction site.
	Social	<ul style="list-style-type: none"> Influx of people potentially seeking employment Safety and security at the site Consideration of local labour and suppliers in the area (positive impact) 	<ul style="list-style-type: none"> Follow the RBIDZ procurement process to ensure fair opportunities for the local communities. Should labour be required during the construction phase, this should be sourced from the local communities. This requirement must be specified within the contract signed by the contractor.
Operational	Soils	<ul style="list-style-type: none"> Soil contamination Soil erosion may occur due to change in land use. Additional hard surface increases run-off resulting in higher velocities and higher erosion potential. The other way in which erosion may occur is converting previous overland flow into concentrated discharge points. 	<ul style="list-style-type: none"> Oil spills to be cleaned up immediately. Any stationery maintenance equipment to have drip trays placed underneath them to capture any leaking oil. Implement the Stormwater Management Plan that will be developed during the impact assessment phase of the process.
	Vegetation and wetlands	<ul style="list-style-type: none"> Loss of vegetation and terrestrial habitat Loss of wetland / riparian habitat Potential loss of Species of Conservation Concern Sedimentation and erosion Infestation of alien species 	<p>Loss of Vegetation and Terrestrial Habitat</p> <ul style="list-style-type: none"> No indigenous vegetation may be collected or used for firewood. If any plants of high conservation value are found on site, a plant 'rescue' operation must be undertaken under the direction of an ecologist / botanist prior to construction, where plants of high conservation value will be impacted by any part of the development. These should be carefully transplanted to a suitable site nearby and watered until established. Where clearing is required outside of earthwork / construction areas, vegetation should be brush-cut rather than cleared to speed re-establishment following site closure. <p>Sedimentation and Erosion</p> <ul style="list-style-type: none"> During rehabilitation, prompt and progressive reinstatement of bare areas is required. The topsoil layer is to be replaced on top during reinstatement. The control of soil erosion and siltation associated with construction and operation is important at all locations on site, and particularly adjacent to wetlands. Both temporary and permanent soil erosion control measures must be used during the construction and operation phases. Any earth-worked areas, which may lay bare for extended periods, should be temporarily grassed. Checks must be carried out at regular intervals to identify areas where erosion is occurring. Remedial action, including the rehabilitation of eroded areas and, where necessary, the relocation of the paths causing erosion, is to be undertaken.

Project Phase	Environmental Aspect	Potential Impacts	Preliminary High Level Mitigation Measures
			<ul style="list-style-type: none"> Large sediment loads must be prevented from entering watercourses. Proliferation of Alien Invasive Species <ul style="list-style-type: none"> Any existing or new exotic vegetation within the proposed development site must be eradicated. Successful re-vegetation within or in proximity to the wetland, if required, is crucial to stabilise soils and limit infestation by invasive alien plant species Rehabilitation should be undertaken on a progressive basis in these areas.
	Fauna	<ul style="list-style-type: none"> Destruction of natural habitat for wildlife Killing of wildlife 	<ul style="list-style-type: none"> Trapping, capturing, hunting or killing of fauna is strictly forbidden throughout the lifetime of the project.
	Surface and groundwater	<ul style="list-style-type: none"> Creation of impermeable / hardened surfaces will cause changes in the surface flow quantity and quality Materials such as oils and grease from on-site machinery exposed to the soil could infiltrate the ground resulting in ground water contamination 	<ul style="list-style-type: none"> Bare areas where vegetation has been removed pose a risk of becoming a sediment load into wetlands during heavy rainfall or windy conditions; thus this must be effectively managed for prevention. Extra care must be taken to prevent any potentially hazardous substances from entering the wetlands during heavy rainfall events. The use of all chemicals and potentially hazardous substances must take place on a drip tray or an impermeable surface. All rubble and other types of waste must be disposed at a licensed waste disposal site to prevent it from entering watercourses. In the event of the spilling of chemicals and potentially hazardous substances, this must be addressed immediately and reported to the relevant authority.
	Air Quality	<ul style="list-style-type: none"> Potential odours emanating from the plant Exhaust emissions from maintenance vehicles 	<ul style="list-style-type: none"> Design control measures for digester and calciner stacks must be developed and strictly implemented. Compliance with the Air Quality Management Plan to be developed during the impact assessment phase. Implementation of reporting procedures that will be developed during the impact assessment phase of the process. Source (off-gases) and dustfall (particulates) monitoring.
	Noise	Noise generated from maintenance vehicles and activities	<ul style="list-style-type: none"> All construction machinery to be serviced regularly and maintained to ensure that noise levels are kept to a minimum. Implementation of noise control measures that will be identified by the Noise Impact Specialist during the impact assessment phase. Compliance with the Noise Management Plan to be developed during the impact assessment phase.
	Visual	<ul style="list-style-type: none"> Visibility of the plant Inadequate rehabilitation of the construction footprint 	<ul style="list-style-type: none"> Areas to be revegetated as soon as construction has been completed.
	Social	<ul style="list-style-type: none"> Influx of people potentially seeking employment Safety and security at the site 	<ul style="list-style-type: none"> Follow the RBIDZ procurement process to ensure fair opportunities for the local communities.

Project Phase	Environmental Aspect	Potential Impacts	Preliminary High Level Mitigation Measures
		<ul style="list-style-type: none">• Consideration of local labour and suppliers in the area (positive impact)	<ul style="list-style-type: none">• Should labour be required during the construction phase, this should be sourced from the local communities. This requirement must be specified within the contract signed by the contractor.

13 Assumptions and Limitations

** In accordance with the purpose of Scoping, this report does not include detailed specialist investigations on the receiving environment, which will only form part of the impact assessment phase.*

The findings included in this Scoping Report are based on existing information from specialist studies undertaken for the RBIDZ Phase 1F EIA and the PTDC EIA undertaken for Nyanza as well as environmental GIS databases.

A detailed description of the site-specific environmental attributes will be updated during the impact assessment phase once all the specialist studies have been concluded.

14 Undertaking of Oath by the EAP

Section 16 (1) (b) (iv), and Appendix 3 Section 2 (j) of the EIA Regulations, 2014 and amended in 2021 (promulgated in terms of the NEMA), require an undertaking under oath or affirmation by the EAP in relation to:

- The correctness of the information provided in the report;
- The inclusion of comments and inputs from stakeholders and I&APs;
- Any information provided by the EAP to I&APs and any responses by the EAP to comments or inputs made by I&APs; and
- The level of agreement between the EAP and I&APs on the Plan of Study for undertaking the EIA.

SRK and the EAPs managing this project hereby affirm that:

- To the best of our knowledge the information provided in the report is correct, and no attempt has been made to manipulate information to achieve a particular outcome. Some information, especially pertaining to the project description, was provided by the applicant and/or their sub-contractors. In this respect, SRK's standard disclaimer pertaining to information provided by third parties applies.
- To the best of our knowledge all comments and inputs from stakeholders and I&APs have been captured in the report and no attempt has been made to manipulate such comment or input to achieve a particular outcome. Written submissions are appended to the report while other comments are recorded within the report. For the sake of brevity, not all comments are recorded verbatim, and in instances where many stakeholders have made similar comments, they are grouped together, with a clear listing of who submitted which comment(s).
- Information and responses provided by the EAP to I&APs are clearly presented in the report. Where responses are provided by the applicant (not the EAP), these are clearly indicated.
- With respect to EIA Reports, SRK will take account of I&APs' comments and, insofar as comments are relevant and practicable, accommodate these during the EIA/EMPr process.

15 Conclusions and Recommendations

The aim of this Scoping Report is to provide an indication of the identified, positive, and negative environmental and socio-economic impacts associated with the proposed project activities. The proposed project will be located within Phase 1F of the RBIDZ. This site is zoned as General Industrial (IDZ Industry) and is in line with proposed project's description. It is expected that the project will lead to the creation of about 1 200 jobs during its construction phase and 550 job during its operational phase. Approximately 680 of these jobs will be for skilled labourers, while 1 070 of these jobs will be for unskilled labourers. People from the Richards Bay area will be preferably employed as this will be the most economically viable option. Should the project not proceed, a large negative socio-economic loss will be a consequence for the region.

The stakeholder engagement in the Scoping Phase will play an important role in determining possible impacts and allowing the concerns by the public to be adequately addressed in the Impact Assessment Phase of the EIA process.

The Scoping Report has presented:

- The environmental process undertaken so far;
- A brief description of the proposed project;
- A baseline description of the current environment;
- The potential environmental and social impacts identified to date; and
- The recommended environmental process to be followed to develop the EIA/EMPr Report.

Once the Scoping Report has been accepted by the KZN EDTEA and DFFE, an EIR, including a Draft EMPr, will be compiled and subjected to a round of public comment. The EIR will then be submitted to the authorities for decision-making. On submission of the EIR and EMPr to the KZN EDTEA and DFFE, notification will be sent to registered I&APs to inform them of the submission of the documents; and the opportunity to request copies of the Final reports.

Anticipated environmental, social and cultural impacts have been identified and described in Section 12 Extensive consideration has been given to the proposed location and design of the project and no fatal flaws have been identified during scoping phase. The DFFE environmental screening tool was used to identify the required specialist studies. The preliminary assessment of the DFFE environmental screening report for the proposed project (very high, high and medium sensitivity) shows that wetland and aquatic assessment as well as terrestrial biodiversity specialist studies will be required. However, due to the requirements of other relevant legislation and project requirements, additional specialist studies including Heritage Assessment, Air Quality Impact Assessment, Noise Impact Assessment, Geohydrology Assessment, Hydropedology, Traffic Impact Assessment and Hydrology and Stormwater Management Plan will also be conducted during the impact assessment phase of the process. In addition, the EAP team will also include a visual and socio-economic impact assessment of the proposed project.

Findings from specialist studies will be incorporated into the EIR and EMPr during the EIA phase. The proposed comprehensive stakeholder engagement process in the PoS will ensure that the stakeholders are involved in the process, from the conception of the EA application process to the end. It is anticipated that implementation of the PoS presented in this report will result in an adequate EIA process which will result in the formulation of a sound EMPr to be integrated into the overall management system of the 80 000 tpa TiO₂ Pigment Plant.

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All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.

Appendices

Appendix A: CVs of the Project Team and EAP Declaration of Interest

Appendix B: Project Experience

Appendix C: Project Layout Plans

Appendix D: Stakeholder Engagement

Appendix D 1: Pre-application Authority Consultation Documents

Appendix D 2: Stakeholder Database

Appendix D 3: Announcement Phase Notifications

Appendix D 4: Site Notices

Appendix D 5: Newspaper Advertisements

Appendix D 6: Comments and Responses Report

Appendix D 7: Stakeholder Communications

Appendix D 8: Commenting Authority Correspondence

SRK Report Distribution Record

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Dr William Mngoma / Pinky Sithole	KZN Ezemvelo Wildlife	14 (HC)	July 2022	HINM
Sandy Camminga	Richard's Bay Clean Air Association (RBCAA)	15 (HC)	July 2022	HINM
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SRK File	SRK Consulting	23 (PDF)	July 2022	HINM

SRK Server	SRK	24 (PDF)	July 2022	HINM
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Approval Signature:



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