1

Overview

- **Oil and Gas Sector Value Chain** - Opportunities in the short-, medium- and long-term.
- **Services and Products** - Oil and gas specialist, specialists, non-specialists and supply chain.
- **Catalytic Projects** - Catalytic projects were identified for both local and regional projects.
- **Richards Bay, One-Stop-Shop** - Assessed the One-Stop-Shop and listed the benefits.
- **Key Requirement for Success** - Divided into government, business community, labour force and general society.

2

Oil and Gas Sector Value Chain

- **Oil and Gas Sector Value Chain** - Opportunities in the short-, medium- and long-term.
- Services and Products .
- Catalytic Projects
- Richards Bay, One-Stop-Shop
- Key Requirement for Success

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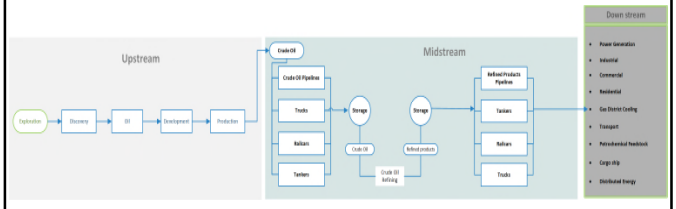
Oil and Gas Sector Value Chain

Oil Value Chain



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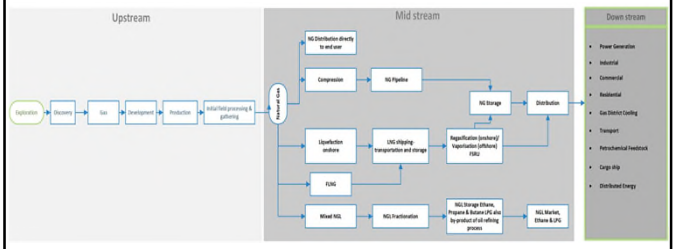
Oil and Gas Sector Value Chain

Gas Value Chain



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Oil and Gas Sector Value Chain

- **Short-term Opportunities** (Time Frame < 5 years):
  - Barge LNG to Richards Bay
  - Extra storage capacity for imported white products
  - CNG filling stations, convert large mining and transport vehicles
  - Convert Avon power plant to operate on gas, as per original design
  - Moor a FSRU to regasify the imported LNG
  - Re-direct gas flow in the Lilly Pipeline

6

Oil and Gas Sector Value Chain

- **Medium-term Opportunities** (Time Frame < 15 years):
  - Construction of a gas to power plant
  - Construction of a rig repair facility
  - Re-using the DJP servitude for extra product pipeline
  - Construction of extra spur lines from the natural gas pipeline
  - Export of electricity to neighbouring countries

7

Oil and Gas Sector Value Chain

- **Long-term Opportunities** (Time Frame > 15 years):
  - Construction of a new oil refinery
  - Construction of a cape size dry dock facility
  - Refining of South Africa's own crude oil after successful explorations
  - Export of white products to the global market
  - Export of LNG to the global market after successful explorations

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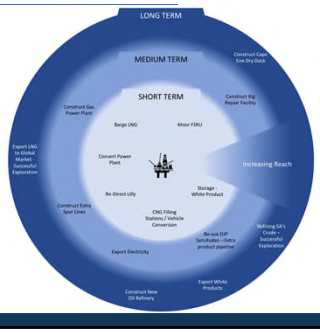
Oil and Gas Sector Value Chain

Short-, Medium- and Long-term Opportunities



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Services and Products

- Oil and Gas Sector Value Chain
- **Services and Products** - Oil and gas specialist, specialists, non-specialists and supply chain.
- Catalytic Projects
- Richards Bay, One-Stop-Shop
- Key Requirement for Success

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Services and Products

- **Oil and Gas Specialist**
- **Specialist** (Government vs General)
- **Non-Specialist**
- **Supply Chain**
- **Multiplier Effect**

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Catalytic Projects

- Oil and Gas Sector Value Chain
- Services and Products
- **Catalytic Projects** - Catalytic projects were identified for both local and regional projects.
- Richards Bay, One-Stop-Shop
- Key Requirement for Success

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Catalytic Projects

- **Classification**

Game Changers	Major Enablers	Major Needs
• Port upgrades to allow for FSRU mooring • Port upgrade to accommodate rig repair facility • Construct a new crude oil refinery • Port upgrade for cape size dry dock facility • Explorations for oil and gas	• Barge LNG to South Africa • Extra Storage Capacity for white products • Convert Avon Power Plant to gas • Re-directing flow direction of Lilly Pipeline • Construction of 2000 MW gas-to-power plant • Re-using the DJP servitude • Construct gas spur lines	• Construct CNG filling stations • Convert heavy vehicles to operate on CNG

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Richards Bay, One Stop Shop

- Oil and Gas Sector Value Chain
- Services and Products
- Catalytic Projects
- **Richards Bay, One-Stop-Shop** - Assessed the One-Stop-Shop and listed the benefits.
- Key Requirement for Success

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Richards Bay, One Stop Shop

- **Services**
  - Company registration and CIPC services;
  - Business permits and Visa Facilitation Service;
  - Unemployment Insurance and Compensation Fund;
  - Environmental Impact Assessments;
  - SARS and Customs;
  - Mining Permits;
  - NRCS, ITAC and SABS;
  - Municipal facilitation;
  - State-owned enterprises;
  - Incentive facilitation;
  - Land zoning and transfer; and
  - Investment promotion and international investment missions.

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Key Requirements for Success

- Oil and Gas Sector Value Chain
- Services and Products
- Catalytic Projects
- Richards Bay, One-Stop-Shop
- **Key Requirement for Success** - Divided into government, business community, labour force and general society.

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Key Requirements for Success

- **Government**
  - Policy and strategy alignment (national, provincial and regional)
  - Environmental matters
  - Availability of land and bulk infrastructures
- **Business community**
  - Potential investors and their readiness
  - Technologies
  - Stakeholder mobilisation and readiness
- **Labour forces and general society**
  - Skills and human capital
  - Public participation

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THANK YOU

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Overview

- **Product Supply –** Potential Supply Markets for natural gas, crude oil and white products
- **Energy Demand –** Energy Demand for natural gas, crude oil and white products
- **Gap Analysis –** PESTEL and SWOT Analysis
- **Regulatory Framework –** Legal Framework Review

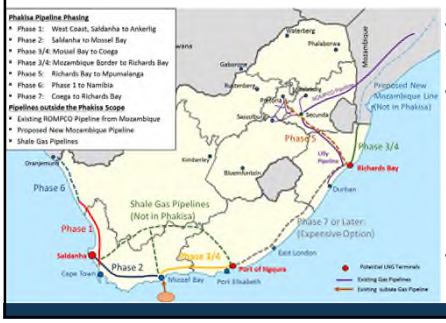
2

Product Supply Review

- **Product Supply –** Potential Supply Markets for natural gas, crude oil and white products
- Energy Demand
- Gap Analysis
- Regulatory Framework

3

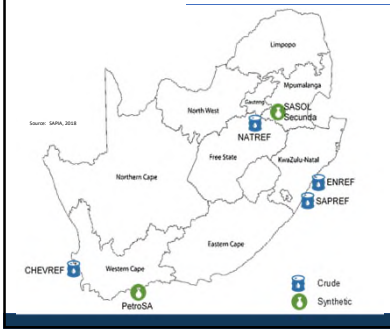
Natural Gas Supply Market



- Importation of LNG - most viable
- Potential Supply Markets:
  - Mozambique
  - Tanzania
  - Oman
  - Qatar
  - USA
  - International Suppliers
- Landed costs (US$/MMBtu)
  - 7.5 - 13.1

4

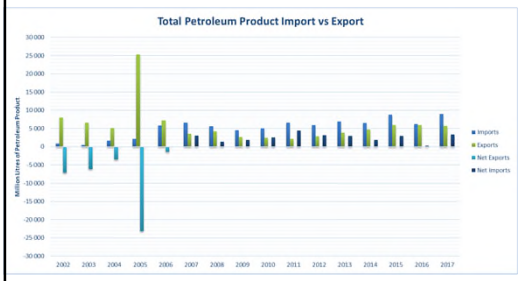
Crude Oil Supply Market



- SAPREF – largest refining capacity
- Shifting of supply market - unlikely
- Potential Supply Markets:
  - Angola
  - Saudi Arabia
  - Nigeria
  - International Suppliers

5

White Products Supply Market



- Net export to net import (2007)
- Potential Supply Markets:
  - UAE
  - India
  - Saudi Arabia
  - Netherlands
  - Singapore

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Energy Demand Evaluation

- Product Supply
- **Energy Demand -** Energy Demand for natural gas, crude oil and white products
- Gap Analysis
- Regulatory Framework

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Africa and Sub-Saharan Demand

LEAP Modelling Tool

User-specified assumptions were based on:

→ Varying population growth figures

→ Accompanying GDP forecasts

Develop 3 scenarios/ energy access alternatives:

1. Business as Usual Scenario
2. Moderate Energy Access Scenario
3. Accelerated Energy Access Scenario

Results

Energy Summary	2015	2020	2025	2030	2035	2040
Business as Usual	131.5	155.3	187.4	229.0	283.0	353.2
Moderate Energy Access	131.5	156.8	190.7	234.5	291.2	364.7
Accelerated Energy Access	131.5	396.0	606.5	651.6	716.1	796.7

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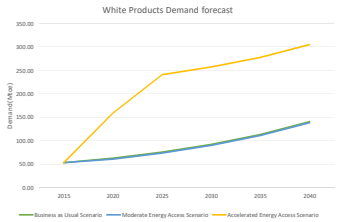
White Products Demand Forecast



	2015	2020	2025	2030	2035	2040
Business as Usual Scenario	52.96	62.72	75.37	91.75	113.01	140.62
Southern Africa	29.30	34.70	41.69	50.76	62.52	77.79
Petrol	10.35					
Diesel	13.02					
LPG	0.41					
Kerosene	2.94					
Residual Fuel Oil	2.58					
Eastern Africa	13.43	15.91	19.12	23.27	28.67	35.67
Middle Africa	8.18	9.69	11.65	14.18	17.46	21.73
Rest of SSA	2.04	2.42	2.91	3.54	4.36	5.43
	2015	2020	2025	2030	2035	2040
Moderate Energy Access Scenario	52.96	60.76	73.46	89.83	110.97	138.35
Southern Africa	29.30	33.03	39.93	48.83	60.33	75.21
Eastern Africa	13.43	15.74	19.03	23.27	28.75	35.85
Middle Africa	8.18	9.59	11.59	14.18	17.52	21.84
Rest of SSA	2.04	2.40	2.90	3.54	4.38	5.45
	2015	2020	2025	2030	2035	2040
Accelerated Energy Access Scenario	52.96	158.73	240.90	256.93	277.73	304.78
Southern Africa	29.30	86.29	130.96	139.67	150.98	165.68
Eastern Africa	13.43	41.13	62.42	66.57	71.96	78.97
Middle Africa	8.18	25.06	38.02	40.55	43.84	48.11
Rest of SSA	2.04	6.26	9.50	10.13	10.95	12.02

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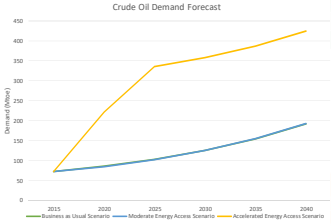
Crude Oil Demand Forecast



	2015	2020	2025	2030	2035	2040
Business as Usual Scenario	72.27	85.6	102.85	125.21	154.22	191.9
Southern Africa	38.46	45.55	54.73	66.63	82.07	102.12
Eastern Africa	19.19	22.73	27.31	33.25	40.95	50.96
Middle Africa	11.69	13.85	16.64	20.25	24.95	31.04
Rest of SSA	2.92	3.46	4.16	5.06	6.23	7.75
	2015	2020	2025	2030	2035	2040
Moderate Energy Access Scenario	72.27	84.7	102.4	125.22	154.7	192.86
Southern Africa	38.46	45.07	54.49	66.64	82.33	102.63
Eastern Africa	19.19	22.49	27.19	33.25	41.08	51.21
Middle Africa	11.69	13.70	16.56	20.25	25.02	31.20
Rest of SSA	2.92	3.42	4.14	5.06	6.25	7.79
	2015	2020	2025	2030	2035	2040
Accelerated Energy Access Scenario	72.27	221.28	335.82	358.17	387.17	424.87
Southern Africa	38.46	117.76	178.71	190.61	206.04	226.10
Eastern Africa	19.19	58.76	89.17	95.11	102.81	112.82
Middle Africa	11.69	35.79	54.32	57.94	62.63	68.72
Rest of SSA	2.92	8.94	13.57	14.47	15.64	17.17

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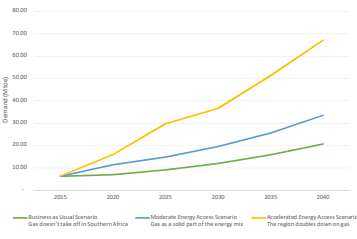
Natural Gas Demand Forecast



		2015	2020	2025	2030	2035	2040
Southern Africa	**Business as Usual Scenario**	6.33	7.03	9.21	12.07	15.81	20.72
	South Africa	5.20	4.88	6.40	8.38	10.99	14.40
	Mozambique	0.59	0.78	1.02	1.34	1.75	2.30
	Botswana	0	0	0	0	0	0
	Namibia	0	0	0	0	0	0
	Rest of SSA	0.54	1.37	1.79	2.34	3.07	4.03
		2015	2020	2025	2030	2035	2040
Southern Africa	**Moderate Energy Access Scenario**	6.33	11.38	14.91	19.54	25.61	33.56
	South Africa	5.20	6.82	8.93	11.70	15.34	20.10
	Mozambique	0.59	3.37	4.41	5.78	7.58	9.93
	Botswana	0	0.26	0.35	0.45	0.59	0.78
	Namibia	0	0.22	0.29	0.38	0.50	0.66
	Rest of SSA	0.54	0.71	0.93	1.22	1.60	2.10
		2015	2020	2025	2030	2035	2040
Southern Africa	**Accelerated Energy Access Scenario**	6.33	16.03	29.82	36.58	51.22	67.12
	South Africa	5.20	8.45	15.71	19.27	26.99	35.37
	Mozambique	0.59	2.77	5.16	6.33	8.86	11.61
	Botswana	0	0.37	0.68	0.84	1.17	1.53
	Namibia	0	0.21	0.39	0.48	0.67	0.88
	Rest of SSA	0.54	4.23	7.88	9.66	13.53	17.73

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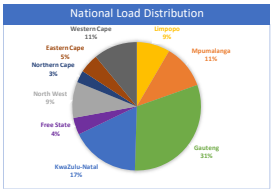
ELECTRICITY DEMAND

South Africa

- ± 37,000 MW
- 37 % demand growth forecasted (2019 – 2028)

National Load Distribution

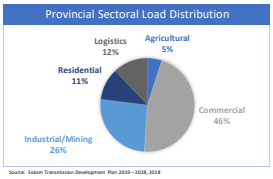


Source: Eskom Transmission Development Plan 2019 – 2028, 2018

KwaZulu-Natal

- ± 6,400 MW
- 18 % demand growth forecasted (2019 – 2028)

Provincial Sectoral Load Distribution



Source: Eskom Transmission Development Plan 2019 – 2028, 2018

Empangeni CLN

- Eskom Direct Customers + Municipality
- ± 2,200 MW
- 7.5 % demand growth forecasted (2019 – 2028)

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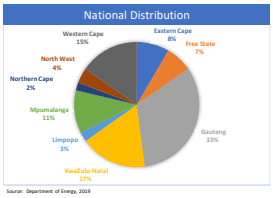
PETROLEUM PRODUCT DEMAND

South Africa
- ± 27,700 Megalitres

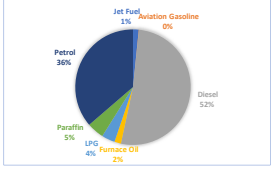
KwaZulu-Natal
- ± 4,700 Megalitres

National Distribution



Source: Department of Energy, 2019

Provincial Sectoral Distribution



Source: Department of Energy, 2019

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Gap Analysis

- Product Supply
- Energy Demand
- **Gap Analysis –** PESTEL and SWOT Analysis
- Regulatory Framework

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PESTEL Analysis

- **Political:** The current and potential influences from political pressures.
- **Economic:** The local, national and world economic impact.
- **Social:** The ways in which changes affect society and the project.
- **Technological:** How new and emerging technology affects project.
- **Environmental:** Local, national and global environmental issues and concerns.
- **Legal:** How local, national and global legislation affects the project.

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SWOT Analysis

STRENGTHS

- Good existing transport infrastructure supporting oil and gas hub (rail and road);
- Land availability for potential Anchor Projects;
- Job creation and improved living conditions;
- Political support from Government and Operation Phakisa Ocean Economy initiatives;
- Improved energy security and energy diversity mix;
- Close proximity to Mozambique;
- Environment and community initiatives;
- New technology, infrastructure, innovation and research.

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SWOT Analysis

OPPORTUNITIES

- New oil and gas infrastructure in SA;
- Would be able to service the East and West Coast of African market;
- Limited gas and oil pipeline infrastructure in the country presents an opportunity for hub to expand;
- No LNG import terminals in Richards Bay and South Africa as a whole;
- Strong domestic energy demand growth;
- Increase in global and national demand for natural gas;
- Government's policy on reducing coal usage due to pollution to boost natural gas production;
- Job creation.

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SWOT Analysis

WEAKNESSES

- Small local skills pool available to the oil and gas hub;
- Converting existing operations to be powered by gas entails high development and switching costs;
- Environmental issues and hazards;
- Bulk water demand requirements;
- Classification of land for expansion and industrialisation;
- Major hub and port competitors.

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SWOT Analysis

THREATS

- Government interventions and Environmental laws;
- Government planned nuclear power projects and Increasing focus on renewable energy;
- Oil and Gas Commodity price fluctuations and unpredictability;
- Increased stakeholder scrutiny and resistance to pipeline projects (pipeline incidents);
- High environmental compliance costs;
- Oil and Gas Commodity price fluctuations and unpredictability;
- Natural disasters.

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Regulatory Framework Analysis

- Product Supply
- Energy Demand
- Gap Analysis
- **Regulatory Framework –** Legal Framework Review

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Acts Considered

- Constitution of the Republic of South Africa
- BBBEE Act *
- Mineral and Petroleum Resources Development Act *
- National Energy Regulator Act
- Petroleum Pipelines Act
- Petroleum Pipeline Regulation
- The Gas Act, 2001 (Act No.48 of 2001)
- Electricity Regulation Amendment Act
- The National Environmental Management Act *
- The National Water Act, 1998
- Occupational Health and Safety Amendment Act and Labour Relations Act *

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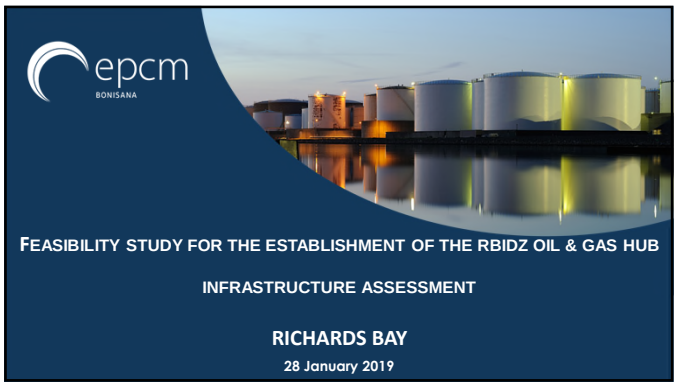

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INFRASTRUCTURE ASSESSMENT

3

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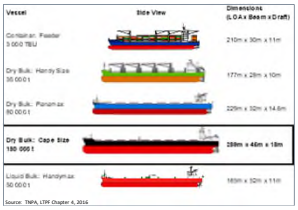
PORT NETWORK

4

EXISTING INFRASTRUCTURE

South African Ports:
- 13,000 ships call at ports every year
- 30,000 vessels sail along SA's coastline annually

Richards Bay's Port:
- Receives nearly 1,500 vessels per annum



Richards Bay Port Authority Services:
- **Anchorage**
  - → 3-5 nautical miles South-East of South Breakwater
- **Berthing**
  - → 23 berths
  - → Between -8m and -19m CDP
- **Pilotage**
  - → Compulsory from 3 nautical miles South-East of South Breakwater
- **Towing/Tug Assistance**
  - → Compulsory with 3 Tugs and NSRI's deep-sea rescue craft
- **Bunkering**
  - → Fixed bunkering at Berth 209 (-12.5m CDP, 225m length) and Berths 301/302 (-17.5m CDP, 350 m length)
  - → Barge bunkering via Smit Energy and Amber II
- **Ship Repair**
  - → Quayside facilities at Small Craft Harbour
  - → Professional divers for ship inspections
  - → Not conducive to servicing vessels associated with off-shore oil and gas industry

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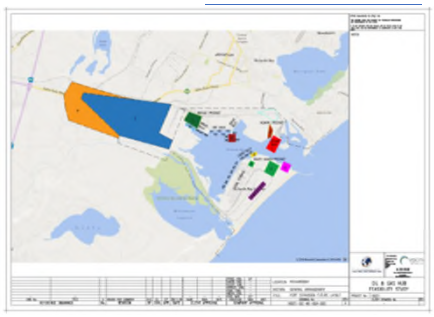
PLANNED UPGRADES



- **New Liquid Bulk Land**
  - → 34 ha (2017-2023)
  - → 40 ha (2024-2046)
- **LNG Import Facility**
  - → FSRU (2017-2023)
  - → Terminal (2024-2046)
- **Repair Facilities**
  - → Floating Dry Dock (2026)
  - → Dry Dock (2024 – 2046)

6

GAP ASSESSMENT

- **Channel Depths**
  - → Suitable for LNG tankers (Q-Flex @ 210,000 m^3 and Q-Max @ 266,000 m^3)
  - → Only suitable for Panamax Oil Tankers (@ 500,000 barrels)
  - → Deepening of channel depth to revised design depth of 21.1 m required to accommodate Aframax Oil Tankers (@ 800,000 barrels)
  - → SBM required to accommodate Suexmax (1,000,000 barrels), VLCC (2,000,000 barrels) and ULCC (4,000,000 barrels)
- **Liquid Bulk Handling Facilities**
  - → Currently available via Bidvest Tank Terminals
  - → Short- and long-term planned capacity increasing projects
- **Gas Bulk Handling Facilities**
  - → No facilities currently available
  - → New LNG berth planned for Berth 207 via a permanently moored FSGU (short-term)
  - → Permanent LNG terminal planned for South Dunes Precinct dig-out basin (medium-term)
- **Ship Repair Facilities**
  - → Currently only quayside facilities available
  - → Deepening of berth to -18m CPD, installation of floating dry dock and refurbishment of existing quay planned (short-term)
  - → New ship repair terminal and dry dock planned west of Small Craft Harbour (medium-term)
  - → First South African Port capable of servicing Cape Size vessels, Panamax oil, LNG Q-Flex and LNG Q-Max tankers

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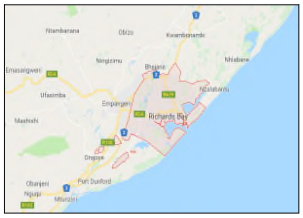
ROAD NETWORK

8

EXISTING INFRASTRUCTURE

Richards Bay Main Access Roads:

- N2
- R34 (John Ross Highway)
- R102
- R619



Port Servicing Roads:

- **R34**
  - → Provisional road, linking Richards Bay, Empangeni and the Port to the N2
- **West Central Arterial**
  - → Western entrance to Port, linking Urania Road (coal and liquid bulk terminals) and CBD
- **Harbour Arterial**
  - → R34 alternative link to the Port, providing access to Bayside Smelters, BTT, RBCT and Liquid Bulk Terminal
- **Medway Road**
  - → Eastern entrance to Port, recently upgraded to four-lane carriageway
- **Bayview Boulevard**
  - → Servicing the Small Craft Harbour

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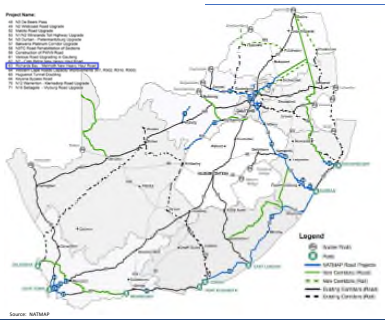
PLANNED UPGRADES



Main Access Servicing Roads:

- **New Heavy Haul Road**
  - → Between Richards Bay and Melmoth

10

GAP ASSESSMENT

There is no direct access road from Richards Bay to Gauteng, with established access only available via R34 or the N2.

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RAIL NETWORK

12

EXISTING INFRASTRUCTURE

Source: LTFP Chapter 3

Richards Bay Railway Lines:

- **"Heavy Haul" Coal Line**
  - → Connects Mpumalanga with RBCT
  - → 35 trains operated daily; 48 % theoretical capacity (74 trains)
  - → Complex and constraint
  - → 80 mt coal and 10 mt minerals and timber
- **Bulk Mineral System**
  - → Developing North-Eastern railway system
  - → Connects hinterland mineral mining with the Ports of Richards Bay and Maputo
  - → Allows for intermodal and general freight traffic

13

PLANNED UPGRADES

Source: Transport Infrastructure Chapter 6

- **New Waterberg/Botswana Heavy Haul Corridor**
  - → New railway line to accommodate 200-wagon trains from Richards Bay
- **South Africa - Swaziland Rail Corridor**
  - → Providing an alternative route to the Ports of Richards Bay and Maputo
  - → Additional general freight capacity of 15-million tons to Richards Bay
- **North-South Corridor**
  - → 4 000 km rail network from Kolwezi (DRC) to the Ports of Richards Bay and Durban
- **Upgrading the Ermelo-Richards Bay Railway Line**

14

GAP ASSESSMENT

Existing infrastructure and planned upgrades seem sufficient for immediate and future needs.

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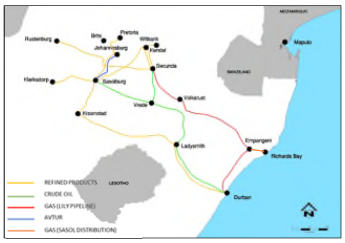
OIL AND GAS PIPELINE NETWORK

16

EXISTING INFRASTRUCTURE



Existing Oil and Gas Pipeline Networks:

- **ROMPCO Pipeline**
  → Mozambique to Secunda
- **Lilly Pipeline**
  → Secunda to Durban
- **NMPP**
  → Durban to Johannesburg
- **SASOL Distribution Pipeline**
  → Empangeni (Lilly Pipeline) to Richards Bay

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EXISTING INFRASTRUCTURE

Lilly Pipeline:

- **Capacity**
  → 23 GJ/annum @ 40 -53 bar
- **Utilisation**

Section	2018	2020	2022	2024	2026	2028	2030	2032	2034	2044	1–59 %
Secunda - New Castle											60–79 %
New Castle – Richards Bay											80–100%
Richards Bay - Durban											>100%

NMPP (incl DJP):

- **Capacity**
  → 148 ML per week
- **Utilisation**

Product	Utilisation	
	2018 Actual	2019 Target
Crude	65 %	70 %
Avtur	83 %	83 %
Gas	70 %	74 %

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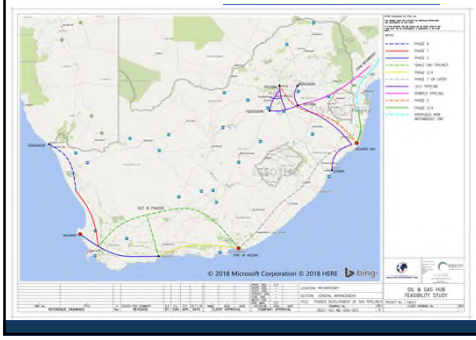
PLANNED UPGRADES



Initiative A1 of Operation Phakisa – Gas Pipelines:

- **Phase 3/4**
  → Mozambique to Richards Bay
- **Phase 5**
  → Richards Bay to Mpumalanga
- **Phase 7**
  → Coega to Richards Bay

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GAP ASSESSMENT

Oil Network:

- **NMPP**
  → Connection to existing infrastructure - New liquid pipeline from Richards Bay to Durban required
  → Spare capacity available for Crude, Gas and Avtur inland transport
- **Liquid Storage Facilities**
  → Additional liquid pipelines required from Berths 208 and 209

Gas Network:

- **Lilly Pipeline**
  → Spare capacity available for distribution along coast (Durban)
  → Inland distribution - Reversing the direction of pipeline or a secondary pipeline required
- **LNG Terminal (FSRU or Permanent)**
  → New gas pipelines required from Berth 207
- **SASOL Distribution Pipeline**
  → New spur lines required for local distribution

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ELECTRICAL TRANSMISSION NETWORK

21

EXISTING INFRASTRUCTURE

KZN Power Supply:
- Mpumalanga Province
- Drakensburg Pumped Storage
- Ingula Pumped Storage
- Avon OCGT

Empangeni LCN Substations:
- 5 400 MVA installed capacity
  → Athene - 2 000 MVA
  → Impala – 1 000 MVA
  → Invubu – 2 400 MVA

Richards Bay Municipality:
- 320 MVA installed capacity
- 230 MVA Notified Maximum Demand
- 197 MVA recorded peak
- 43 Substations
  → 12 x 132 kV
  → 31 x 11 kV

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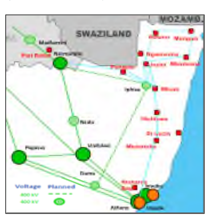
PLANNED UPGRADES

Ermelo-Richards Bay Coal Link Substations:
- **Madlanzini substation** loop into Camden-Normandie
- **Nzalo substation** loop into Normandie-Umfolozi
- **Duma substation** loop into Pegasus-Athene

Jozini and Umhlabuvalingana Municipalities Substations:
- **Iphiva substation** loop into Normandie and integration near Mkuze (Phase 1)
- **Iphiva substation** loop into Duma (Phase 2)



23

GAP ASSESSMENT

Planned electrical transmission network upgrades fall outside the boundaries of Richards Bay.

There is a clear need for additional sources of electricity in Richards Bay as well as country wide, with the maximum IPPs generation capacity available in the Empangeni CLN area limited to 3,700 MW

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COMMUNICATION NETWORK

25

EXISTING INFRASTRUCTURE

- **Fibre**
  - → Richards Bay and Empangeni
  - → Single Mode
  - → 96 Core
  - → ± 20 % Utilisation
  - → 6 Spare tubes installed (all civil work completed, only new fibre cables required to increase capacity)
  - → Back-up via Radio (insufficient infrastructure for total demand)
- **Telecommunication**
  - → Telkom
  - → Neotel
  - → Vodacom (LTE, 3G, EDGE, GPRS)
  - → MTN (LTE, 4G, EDGE, GPRS)
  - → Cell C (LTE, 3G, EDGE, GPRS)
  - → Mobile towers utilised during high-demand seasons to accommodate additional network traffic

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PLANNED UPGRADES

- **Fibre Route**
  - → Richards Bay and Empangeni via N2 (redundancy)
  - → Richards Bay and eNseleni (Phase 3)
  - → Richards Bay and Meerensee (Phase 4)
- **Tamper Detection**
  - → Early tamper detection for underground cables
- **Wi-Fi Broadband/Public Wi-Fi**
  - → Harbour area

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GAP ASSESSMENT

Existing infrastructure, available redundancy and planned upgrades seem sufficient for immediate and future needs.

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MUNICIPAL WATER AND SANITATION NETWORK

29

EXISTING INFRASTRUCTURE

- **Richards Bay Water Supply System (RBWSS)**
  - → Supplies City of uMhlathuze and large industries
- **Water Sources**
  - → Mhlathuze river
  - → Mflolozi river
  - → Lake Nhlabane
  - → Lake Mzingazi
  - → Lake Cubhu
  - → Portable desalination plant (10 ML/day)
- **Water Treatment Works**
  - → WSSA owned and operated
    - Mzingazi
    - Nqwelezane
    - eSikhaleni
  - → Mhlathuze owned and operated
    - Nsezi
- **Offshore Waste Disposal System**
  - → Operated by Mhlathuze Water
  - → Two pipelines (buoyant line and dense line)
  - → Transfer wastewater from
    - Richards Bay Industries
    - Nsezi WTP
    - uMhlathuze Municipality

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PLANNED UPGRADES

- **Mhlathuze Weir Structure**
  - → Provide redundancy
  - → New structure supplementing the existing weir
- **2.5 MVA Weir Standby Generator**
  - → Augment power supply in the event of an Eskom power outage
- **New Raw Water Pipeline**
  - → 1,500 m diameter
  - → From Mhlathuze river to the Shooting Range
- **New Effluent Treatment Plant**
  - → Treating industrial and domestic effluent
  - → Re-use effluent as water supply to industries
  - → 75 ML/d
- **Nsezi WTP Augmentation**
  - → Increase output from 205 ML/d to 260 ML/d
- **New Raw Water Pipeline**
  - → 1,500/1,200 mm diameter
  - → From Mhlathuze Weir to Nsezi WTW

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GAP ASSESSMENT

Planned upgrades seem sufficient for immediate needs.

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AIRPORT NETWORK

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EXISTING INFRASTRUCTURE

- **Type**
  - → Public domestic
  - → 100,000 Annual schedule arrivals
- **Operations**
  - → Air Cargo
  - → Recreational flying
  - → Commuter schedule
  - → Corporate and charter flights
  - → Flying training
  - → Aviation fuel sales
- **Runway and Taxiway**
  - → Code 3C with restrictions (1,500 m long and 22 m wide)
- **Aircraft Parking**
  - → 2 x Code C parking (24 m < Wingspan < 36 m)
  - → 1 x Freight
- **Terminal Capacity**
  - → 100 Passengers per hour

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PLANNED UPGRADES

- **Relocation**
  - → Required due to peri settlement increase
  - → Close proximity to N2
- **Airport Capacity**
  - → Upgrade to 0.3 MAP
- **Airport Runway and Taxiway**
  - → Upgrade to Code 4C (2,400 m long and 45 m wide)
- **Aircraft Parking**
  - → Upgrade to 4 Code 3C bays
- **Terminal Capacity**
  - → Upgrade to 250 passengers per hour

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GAP ASSESSMENT

Upgrading and relocation of the airport, to a suitable location between Richards Bay and Empangeni, is required. Establishment of an aviation maintenance company at the upgraded airport will be required.

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HIGH LEVEL ENVIRONMENTAL IMPACT ASSESSMENT FOR THE ESTABLISHMENT OF THE RBIDZ OIL & GAS HUB

RBIDZ

06 June 2019

1

Overview

- **Baseline studies conducted**
- **Proposed Sites and triggered activities under NEMA.**
- **Summary of triggered activities**
- **Proposed Specialist Studies**
- **Proposed Licences**
- **Full Scoping and EIA Timeline**

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Baseline studies conducted

3

Baseline studies conducted

The High Level Environmental Impact Assessment is based on the accuracy of the following Baseline studies already conducted:

- Environmental Management Framework for the Richards Bay Port Expansion Area and Industrial Development Zone: Supplementary Report (21 May 2010);
- Environmental Impact Assessment Process: Final Scoping Report for the Richards Bay Combined Cycle Power Plant (CCPP) and Associated Infrastructure near Richards Bay (Phase 1D);
- Land Evaluation and Guidelines to inform Future Industrial Development Planning in Richards Bay , Inception Report. Conducted by Thorn-Ex;
- Environmental Risk Evaluation and Guidelines for the Richards Bay Industrial Development Zone, Status Quo Report. Conducted by Thorn Ex;
- Environmental Risk Assessment of Richards Bay IDZ, 1A, 1B, 1C, 1D & 1F.Conducted by Thorn Ex;
- as well as relevant experience in the environmental management field.

The data supplied was evaluated and considered sufficient for the purposes of this high-level Environmental Impact Assessment.

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Proposed Sites and Triggered Activities

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Proposed Sites and Triggered Activities

Phase 1C - Determined to accommodate a light/medium industry type of operation such as a chemical storage facility.

Phase 1D - Identified to accommodate a heavy industry operation and a Gas to Power plant was proposed to be allocated in the site.

Phase 2A - Assessed to accommodate the proposed Oil refinery.

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Triggered Activities : Phase 1C

Proposed Site	Proposed Triggered Activity
Phase 1C	According to the opportunity analysis it is proposed that a storage facility with a capacity between 60 000m^3 – 100 000m^3 Be constructed on the site. In this case the following activities in terms of Listing Notice 2 will be triggered and this will lead to a Full Scoping and EIA. • ***Activity 4*** *-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.* *An MHI to be considered for the construction of this storage facility*

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Triggered Activities : Phase 1D

Proposed Site	Proposed Triggered Activity
Phase 1D	Phase 1D was earmarked by Eskom for a Gas to power station. In terms of the scope of work the following activities in Listing notice 2 would be triggered and lead to a full Scoping and EIA: ***Activity 5*** *- The development and related operation of facilities or infrastructure for the processing of a petroleum resource, including the beneficiation or refining of gas, oil or petroleum products with an installed capacity of 50 cubic meters or more per day, excluding 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 the National Environmental Management: Waste Act, 2008 applies.* ***Activity 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.*

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Triggered Activities : Phase 1D

Proposed Site	Proposed Triggered Activity
Phase 1D	***Activity 9*** *- The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —* *a) temporarily required to allow for maintenance of existing infrastructure;* *b) 2 kilometers or shorter in length;* *c) within an existing transmission line servitude; and* *d) will be removed within 18 months of the commencement of development.* ***Activity 7*** *- The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods —* ***I. in gas form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 700 tons per day;*** *II. in liquid form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 50 cubic metres per day; or* *III. in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons per day.*

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Triggered Activities : Phase 2A

Proposed Site	Proposed Triggered Activity
Phase 2A	It is proposed that this facility will generate between 200 000 – 600 000 barrels per day with a storage capacity of >100 000m³. If the storage capacity exceed 500m³ it requires a Full Scoping and EIA as per Activity 4 under the National Environmental Management Act (NEMA). ***Activity 4*** *-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.*

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Summary of Triggered Activities

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Summary of Triggered Activities

Number of relevant notice and Act No.	Description
GN R984, Activity 4:	*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.*
GN R984, Activity 5:	*The development and related operation of facilities or infrastructure for the processing of a petroleum resource, including the beneficiation or refining of gas, oil or petroleum products with an installed capacity of 50 cubic meters or more per day, excluding 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 the National Environmental Management: Waste Act, 2008 applies.*

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Summary of Triggered Activities

Number of relevant notice and Act No.	Description
GN R984, Activity 6:	*The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding–* *I. activities which are identified and included in Listing Notice 1 of 2014;* *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 the National Environmental Management: Waste Act, 2008 applies;* *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 2000 cubic metres or less; or* *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.*

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Summary of Triggered Activities

Number of relevant notice and Act No.	Description
GN R984, Activity 28:	***IF an AEL is required:*** *[Commencing of an activity, which requires an atmospheric emission license in terms of section 21 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), excluding -* *i. activities which are identified and included in Listing Notice 1 of 2014;* *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 the National Environmental Management: Waste Act, 2008 applies; or* *iii. the development of facilities or infrastructure for the treatment of effluent, wastewater or sewage where such facilities have a daily throughput capacity of 2000 cubic metres or less.]*

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Proposed Specialist Studies

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Proposed Specialist Studies

Environmental Specialist Studies
Air Quality Assessment (AQA)
Heritage Scoping Assessment (HAS)
Terrestrial Ecological Habitat Screening
Geohydrological Contamination Risk and Groundwater Assessment
Storm water Management Plan (SWMP)
Waste Management (WM)
Traffic Impact Assessment (TIA)
Heritage Impact Assessment (HIA)
Major Hazardous Installation (MHI)

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Proposed Licence Applications

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Proposed Licence Applications

Proposed License Applications
Air Emissions License (AEL)
Waste Management License (WML)
Water Use License (WUL)

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Proposed EIA Workplan

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Proposed EIA Workplan

The following work plan will become relevant should the application be listed as a full Scoping and EIA application.

Phase A: Pre-Application

Phase B: Submission of Application to competent authority

Phase C: Submission of Scoping Report and Plan of Study for EIA

Phase D: Public Meeting

Phase E: Compilation and Submission of Environmental Impact Assessment (EIA) Report

Phase F: Inform Interested and Affected Parties (I&APs)

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Full Scoping and EIA Timeline

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Full Scoping and EIA Timeline

Actions	Time	Department Time
Site Visit and initial project related discussions	1 week	-
First Phase Public Participation	30 days	-
Submission of Application to competent authority	1 week	10 days
Compile and submit Draft Scoping Report and Plan of Study (PoS)for EIA to I&AP's and the Department	14 days	Acknowledge of receipt of reports within 10 days
Amend reports and submit final Scoping Report and Plan of Study for EIA to the Department	1 week (depending on amendments required)	10 days of receipt Response within 43 days
Conduct EIA, compile and submit Draft EIA report and draft EMP	3 months	Acknowledge receipt of reports – 10days

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Full Scoping and EIA Timeline

Actions	Time	Department Time
Amend (if required), compile and submit final EIA report and draft EMP	1 month	Acknowledge of receipt of reports within 10 days of receipt. Decision - 107 days after acceptance of final EIA Doc.
Site Visit and initial project related discussions	Within 14 days of receipt of decision	-
Total Time	**± 10 - 12 months**	**± 12 - 18 months.**

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Water Use License Process

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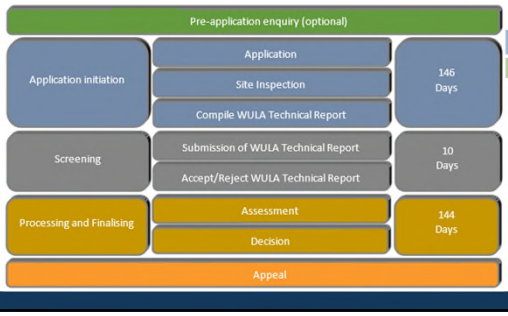
Water Use License Process



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Conclusion

The sites assessed will be recommended for each type of operation. It should be noted that the type of operation influences the project location as well as the natural environment to great extents.

In general, it is proposed that the selected sites will require a Full Scoping and EIA with the identified licences playing a major role in the duration of the process.

In order to determine exactly which licenses are needed, the exact amount of waste, emission and water present will be required to make an accurate conclusion, and this can only be determined after more detailed engineering has been completed.

The high level findings however indicate that the Richards Bay IDZ has great potential and the selected operations on the identified sites can feasibly be executed.

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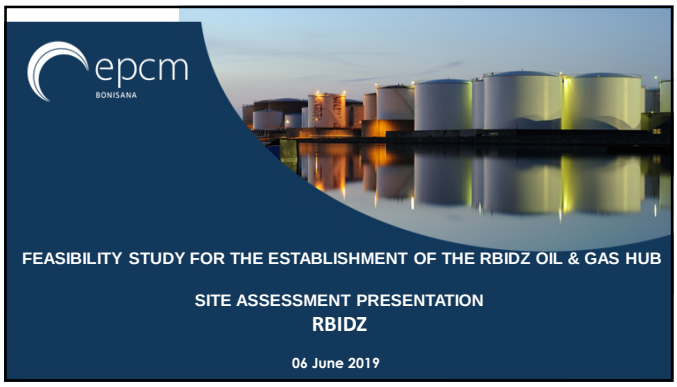
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FEASIBILITY STUDY FOR THE ESTABLISHMENT OF THE RBIDZ OIL & GAS HUB
SITE ASSESSMENT PRESENTATION
RBIDZ
06 June 2019

1


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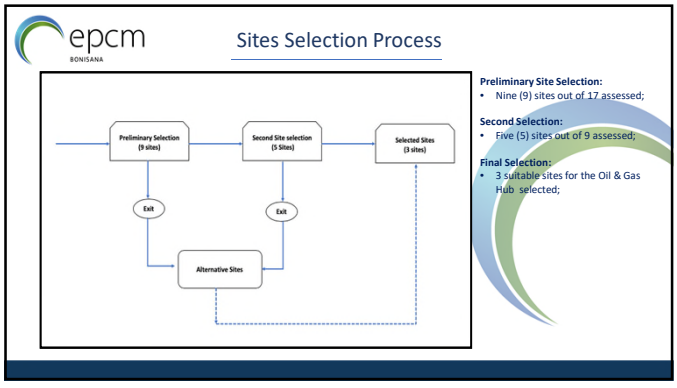
Overview
Site Selection Process
Preliminary Site Selection
Secondary Site Selection
Final Site Selection
Recommendations

2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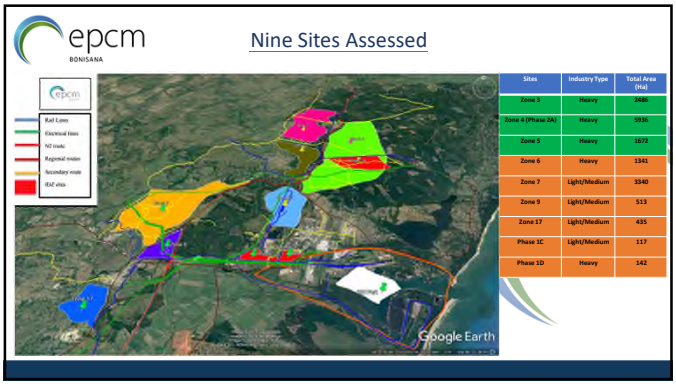
Sites Selection Process
Preliminary Selection (9 sites)
Second Site selection (5 Sites)
Selected Sites (3 sites)
Exit
Exit
Alternative Sites
Preliminary Site Selection:
Nine (9) sites out of 17 assessed;
Second Selection:
Five (5) sites out of 9 assessed;
Final Selection:
3 suitable sites for the Oil & Gas Hub selected;

3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Nine Sites Assessed
Google Earth
Sites
Industry Type
Total Area (Ha)
Zone 3
Heavy
2686
Zone 4 (Phase 2A)
Heavy
5936
Zone 5
Heavy
1672
Zone 6
Heavy
1341
Zone 7
Light/Medium
3340
Zone 9
Light/Medium
513
Zone 17
Light/Medium
435
Phase 1C
Light/Medium
117
Phase 1D
Heavy
142

4

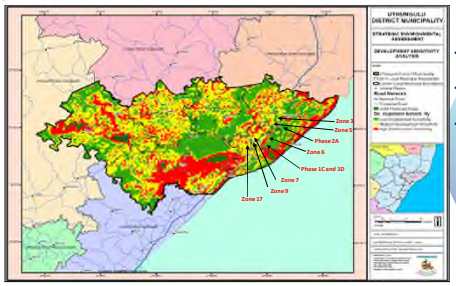
Preliminary Site Selection

Criteria Used

- Development Sensitivity developed by the KCDM;
- Geotechnical Constraints - Study conducted by Golder for the uMhlathuze LM;
- Groundwater Sensitivity - Study conducted by Golder for the uMhlathuze LM;

5

Preliminary Site Selection

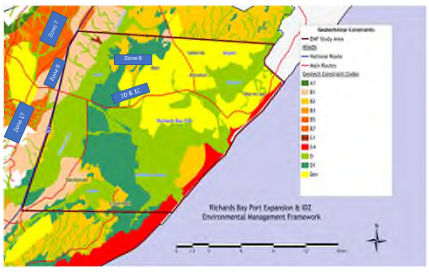


Development Sensitivity

- Category 1: High Development Sensitivity
- Category 2: Medium Development Sensitivity
- Category 3: Low Development Sensitivity

6

Preliminary Site Selection



Geotechnical Constraints:

A : Have no restrictions on development;

B : Are developable, but with minor geotechnical and/or development constraints;

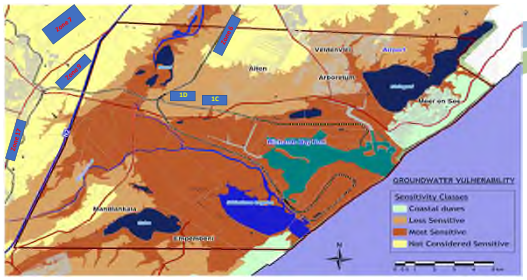
C : Is developable, but with costlier geotechnical and/or development constraints. More detailed geotechnical investigations may be required.

D : Recommends no development, or more detailed geotechnical investigations required.

7

Preliminary Site Selection

Ground-water Sensitivity



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Preliminary Site Selection: Findings

Zone/Site	Development Sensitivity	Geotech Constraints	Groundwater Sensitivity
Phase 1C	Low Development	D and Dev	Less Sensitive
Phase 1D	Low Development -	D1 and Dev	Less Sensitive
Zone 3	Medium Development Sensitivity	B5 ,B7 ,and D	Less Sensitive
Zone 4 (Phase 2A)	Low Development	B2 and D	Less Sensitive
Zone 5	Low Development	N/A	Less Sensitive
Zone 6	Low Development	B3 , B5 ,B7 ,D and D1	Less Sensitive
Zone 7	Medium and High Development Sensitivity	B5 ,B7 ,D and D1	Not Considered Sensitive
Zone 9	Medium Development Sensitivity	B5 and D	Not Considered Sensitive
Zone 17	Medium and High Development Sensitivity	B3 , B5 and D	Not Considered Sensitive

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Preliminary Results

Zone/Site	Sensitivity			Selected Sites
	Development	Geotechnical	Groundwater	
Phase 1C	3	3	2	√
Phase 1D	3	3	2	√
Zone 3	3	4	2	X
Phase 2A	2	3	2	√
Zone 5	3	4	2	X
Zone 6	3	3	2	√
Zone 7	4	5	1	X
Zone 9	3	3	1	√
Zone 17	4	3	1	X

Ratings (1- 5)	Sensitivity
1	low
5	High
Good	Acceptable
Fair	Fair
Bad	Not Acceptable

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Second Site Selection

Criteria Used: Proximity factor

- Proximity to Richards Bay Port;
- Proximity to Residential Areas; and
- Proximity to Water sources and Treatment Works;

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Second Site Selection

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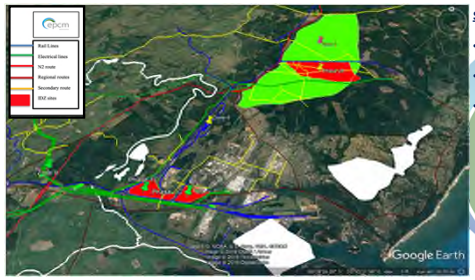
Second Selection Results

Zone/Site	Prox. To RB Port	Prox . to Residential Areas	Prox. To water sources/treatments	Selected Sites
Phase 1C	1	5	2	√
Phase 1D	1	5	2	√
Phase 2A	3	5	3	√
Zone 6	2	2	3	X
Zone 9	2	2	2	X

Ratings (1-5)	
1	Near
5	far
	Preferred
	Fair
	Not Preferred

13

Final Sites Selected



Selected Sites for the Hub:

- Phase 1C
- Phase 1D
- Phase 2A (Zone 4)

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Bulk Infrastructure

Phase 1C and Phase 1D: Existing Road, Rail and Electrical

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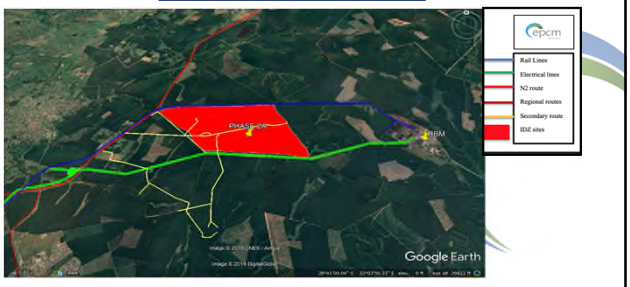
Bulk Infrastructure

Phase 2A: Existing Road, Rail and Electricity



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Bulk Infrastructure

Phase 1C , Phase 1D and Phase 2A

17

3 Sites Assessment Findings

Sites/Zone	Bulk Infrastructure			
	Road	Rail	Electrical	Water
Phase 1C				
Phase 1D				
Phase 2A				

Sites/Zone	Environmental Sensitivity			
	Wetlands	Geo-technical	Biodiversity	Air quality
Phase 1C				
Phase 1D				
Phase 2A				

Sites/Zone	Zoning		
	Light	Medium	Heavy
Phase 1C			
Phase 1D			
Phase 2A			

Ratings
Good
Fair
Bad

Ratings
Less Sensitive
Fair
Most Sensitive

Ratings
Accepted
Fair
Not Accepted

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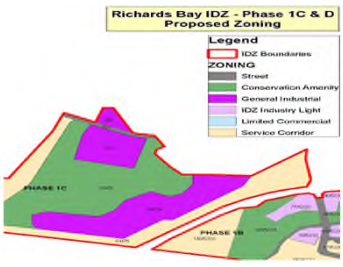
Recommendation

White Product Storage Facility/ Chemical Storage



- Current land use includes: open space with existing railway that links Alton with the port.
- Servitudes (gas pipeline and water)
- Infrastructure (water pipeline, sewer pipes, stormwater)

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Phase 1C

White Product Storage Facility/ Chemical Storage

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Recommendation

Gas to Power: Phase 1D

Phase 1D has its advantages

- The existing bulk infrastructure at proximity,
- Proximity to the port and related industries
- Less vegetation/plantation trees.

Current land use includes: open space with a road and associated stormwater infrastructure.

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Phase 1D

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Recommendation

Oil Refinery

Phase 2A has its advantages

- Close proximity to the port and economic hub (Gauteng)
- Recent indication by ENI/Sasol to explore the coast of KZN
- Eucalyptus tree plantation.

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Phase 2A

Oil Refinery

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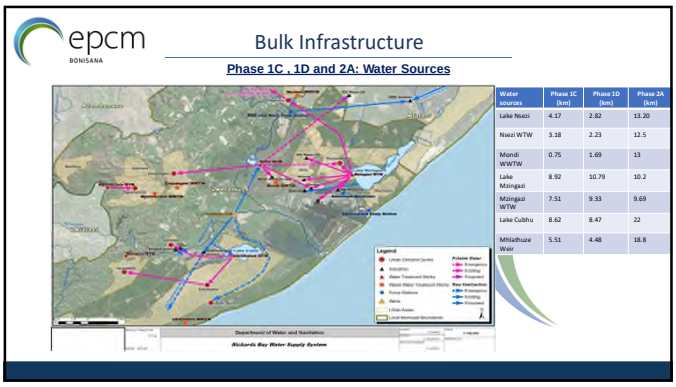
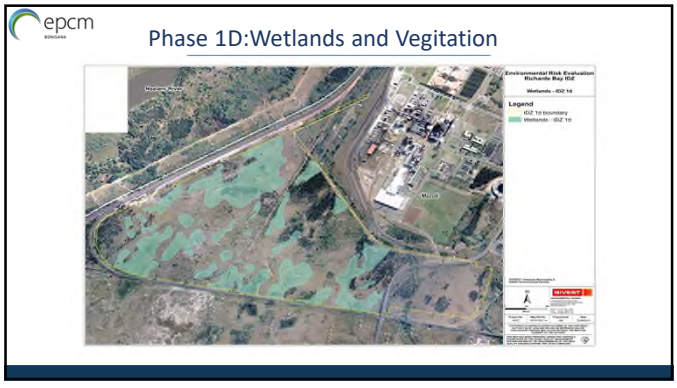
epcm
BONISANA
THANK YOU

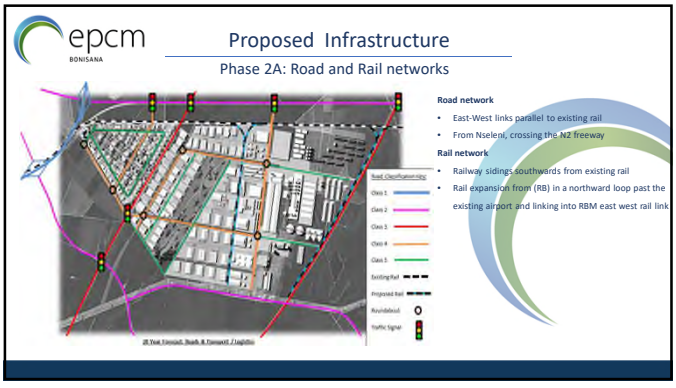
25


epcm
BONISANA
Bulk Infrastructure
Phase 1C , 1D and 2A: Water Sources
Water sources | Phase 1C (km) | Phase 1D (km) | Phase 2A (km)
Lake Nsezi | 4.17 | 2.82 | 13.20
Nsezi WTW | 3.18 | 2.23 | 12.5
Mondi WWTW | 0.75 | 1.69 | 13
Lake Mzingazi | 8.92 | 10.79 | 10.2
Mzingazi WTW | 7.51 | 9.33 | 9.69
Lake Cubhu | 8.62 | 8.47 | 22
Mhlathuze Weir | 5.51 | 4.48 | 18.8

26


epcm
BONISANA
Phase 1D:Wetlands and Vegitation

27


epcm
BONISANA
Proposed Infrastructure
Phase 2A: Road and Rail networks
Road network
East-West links parallel to existing rail
From Nseleni, crossing the N2 freeway
Rail network
Railway sidings southwards from existing rail
Rail expansion from (RB) in a northward loop past the existing airport and linking into RBM east west rail link

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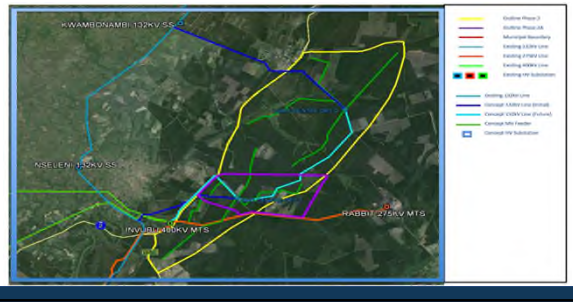
Proposed Infrastructure

Phase 2A: Electrical networks



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Bulk Infrastructure

Phase 1C, 1D & 2A: Existing Airport

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Bulk Infrastructure

Phase 1C , 1D and 2A: Rail Network

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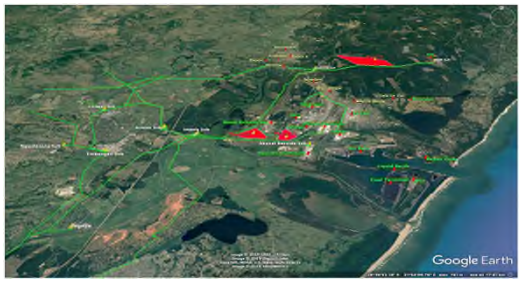
Bulk Infrastructure

Phase 1C , 1D and 2A: Electrical Network



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Bulk Infrastructure

Phase 1C: Water Sources and Treatments

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Bulk Infrastructure

Phase 1D: Water Sources and Treatments

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Bulk Infrastructure

Phase 2A: Water Sources & Treatments

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Proposed Infrastructure

Phase 2A: Road and Rail networks

Road network

- East-West links parallel to existing rail.
- from Nseleni, crossing the N2 freeway.

Rail network

- Railway sidings southwards from existing rail.
- Rail expansion from y(RB) in a northward loop past the existing airport and linking into RBM east west rail link

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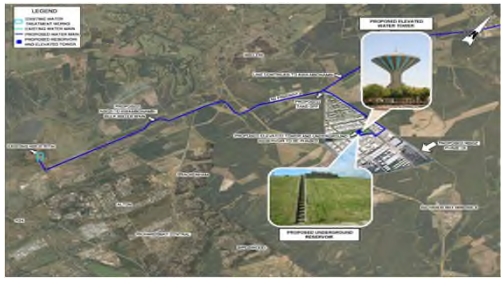
epcm

Proposed Infrastructure

Phase 2A: Water



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