TRANSNET

delivering on our commitment *to you*

SUSTAINABLE TRANSPORT AND LOGISTICS

Considerations and opportunities for infrastructure investment programmes

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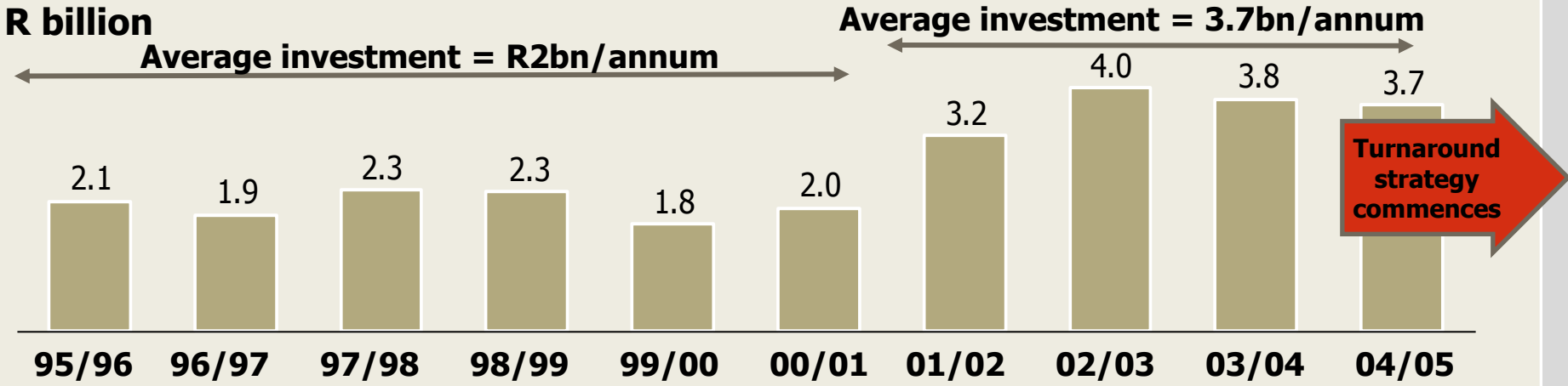
Overview

1. Turning around historic under-investment
2. Sustainable development: economic, social and environmental value
3. Environmental planning and management in capital projects
4. Examples of innovation in capital projects

Historic underinvestment

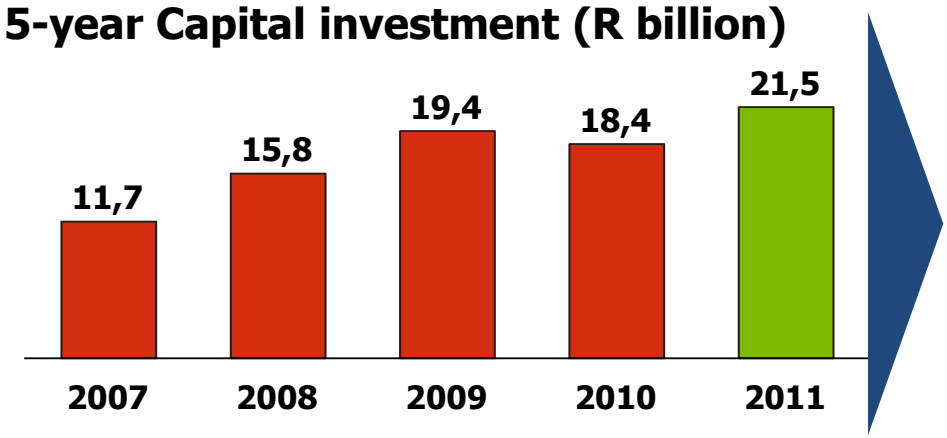
Transnet Historical Capital Investment in ports, rail, pipelines – Pre-turnaround strategy

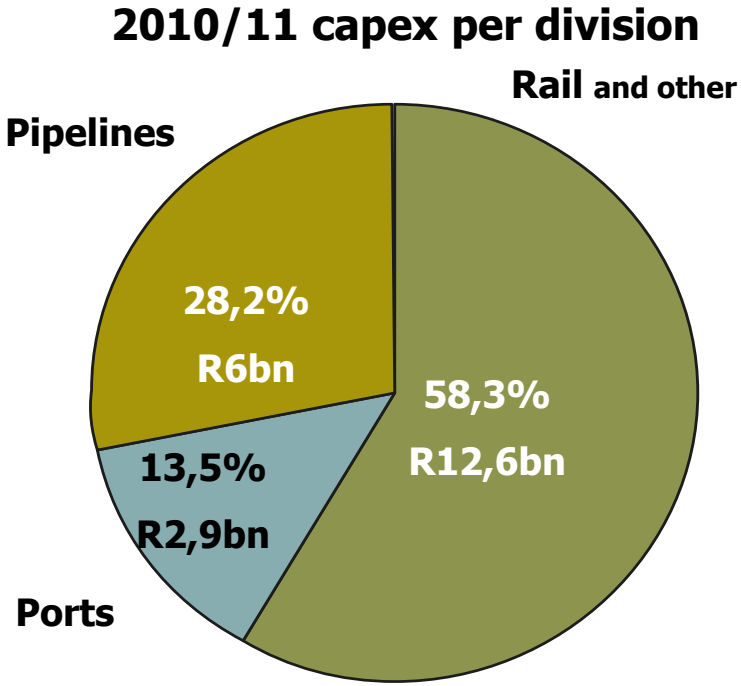


Annual Average Investment over 10-years = R2.7bn

- Average age of locomotive fleet exceeded 30 years (Class 1 railways average 15 years)
- Reduced rolling stock fleet
- Sub-optimal maintenance regime, including rail infrastructure
- Old generation and outdated equipment resulting in inefficiencies
- Inadequate capacity at ports and terminals to handle growing demand
- Inadequate investment to build capacity ahead of demand

Capital investment 2007-2011: R86.8bn





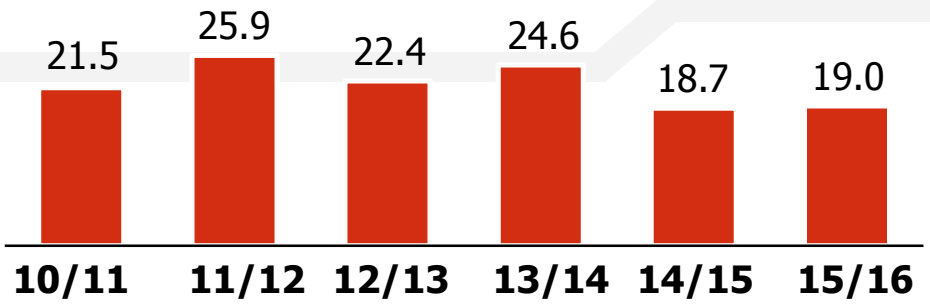
Total investment of R86,8 billion over past 5 years, funded without government guarantees, on the strength of Transnet's financial position.

Current five-year capital investment plan: R110bn

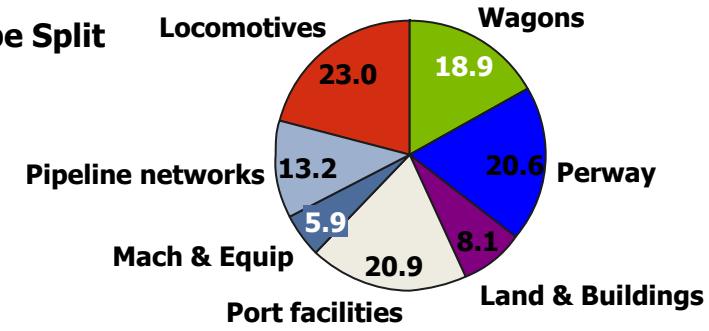
Capital investment (R billion)

R110bn (2011/12 – 2015/16)

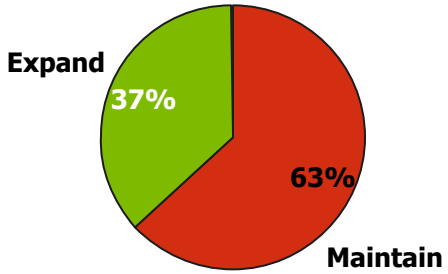
(Excl. capitalised borrowing cost)



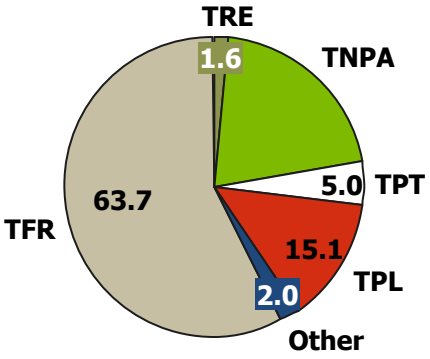
Asset Type Split (Rb)



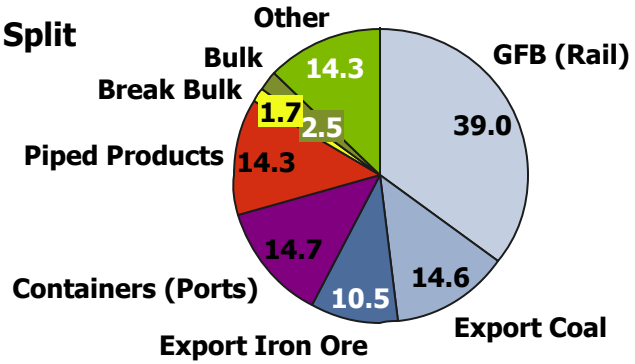
Maintaining vs Expansion (%)



Divisional Split (Rbn)

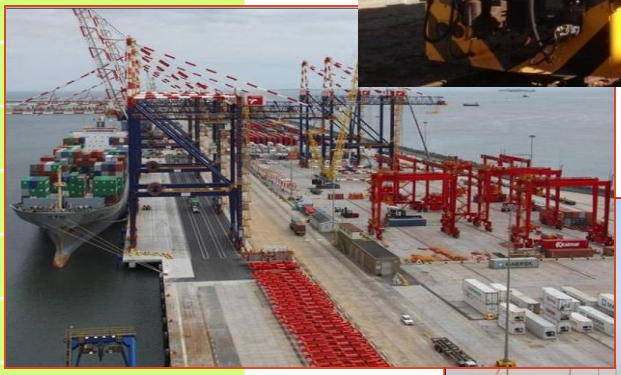


Commodity Split (Rbn)



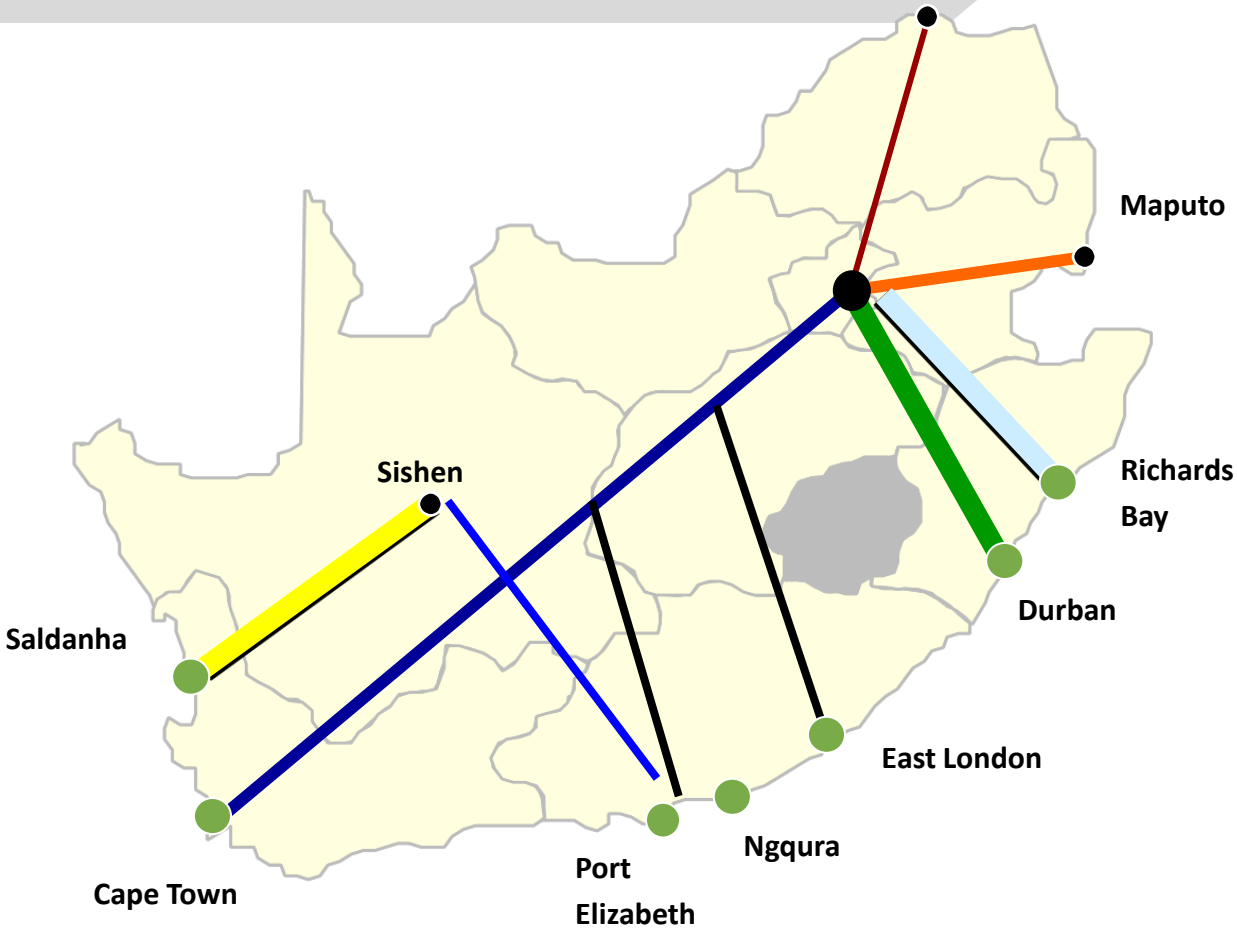
Current five-year investments - major projects

R110.6 billion investment
Iron Ore Line expansion to 60m tons per annum
Iron Ore Line: 76 Class 15E locomotives
New Multi-Product Pipeline
Coal Line expansion to 81 mtpa
Coal line: 110 Class 19E dual voltage locos
Durban Container Terminal Reengineering
Ngqura Container Terminal
Durban entrance channel sand bypass
Cape Town Container expansion
Acquisition of 100 Class 43 diesel locomotives
Acquisition of old Durban Airport site for new port
Reconstruction of quay walls at Maydon Wharf
Durban Container Terminal berth deepening
Pier 1 Phase 2 expansion into Salisbury Island



Corridor investments to build freight system density

30-year horizon Transnet Infrastructure Plan



Targeting Sustainability in all we do

Transnet is committed to delivering lasting economic, social and environmental value for both present and future generations.

Key sustainability focus points for Transnet capital investments:

- ❑ Getting more cargo on rail
- ❑ Local supplier industry development
- ❑ Skills development
- ❑ Energy efficiency
- ❑ Biodiversity protection and enhancement
- ❑ Safety
- ❑ Stakeholder engagement

In July 2011 Transnet published its first Integrated Annual Report and Sustainable Development Report, in line with King III and the Global Reporting Initiative. **www.transnet.net**

Localisation in locomotive acquisition programme

Project	Rm	%
	Total Contracted	Local Content Committed
100 Class 43 Diesel Locomotives	2,300	54%
GM Long Term Parts Agreement	1,359	12%
50 Like New Locomotives	481	67%
EMD Long Term Parts Agreement	543	39%
32 Class 15E new Locomotives	1,312	40%
44 Class 15E new Locomotives	1,980	39%
110 Class 19E new Locomotives	3,300	39%
Total	**11,279**	**41.00%**

Class 43 Diesel

Regenerative power opportunities in new locomotives on the ore line and the coal line

- In regenerative braking, the force required to turn traction motors is used as a train braking force. On down gradients, both mechanical and electrical braking power is needed to regulate speed. Electrical power consists of regenerative power and power dissipated in on-board brake resistors.
- Regenerative energy is fed back into the overhead track equipment via locomotive pantographs. This power can be used by other trains in the section.
- The quantum of potential electricity savings, and the operational requirements to achieve these, are currently being investigated.

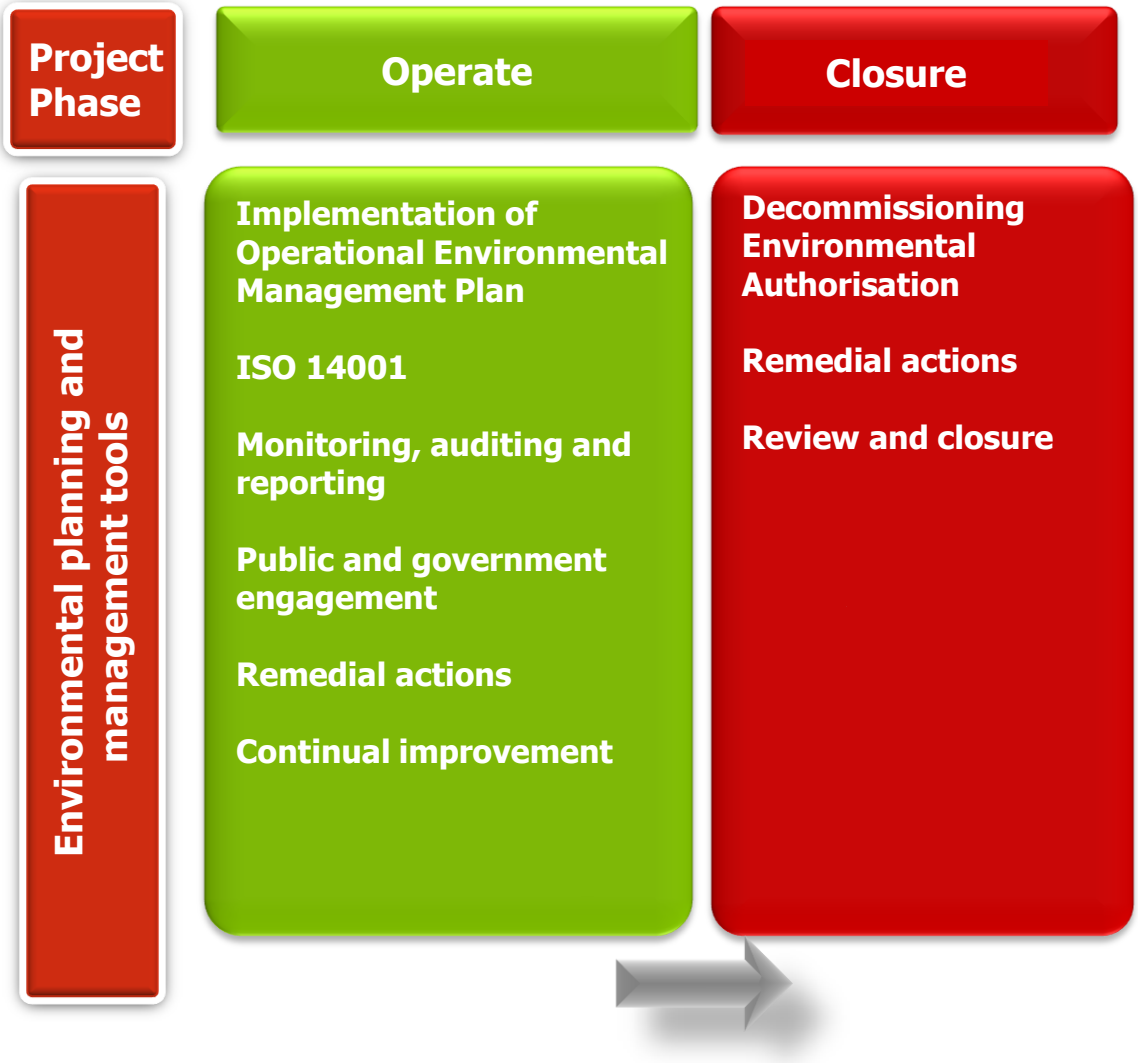
Class 19E 25kV on Coal line

Class 15E 50kV on Ore line

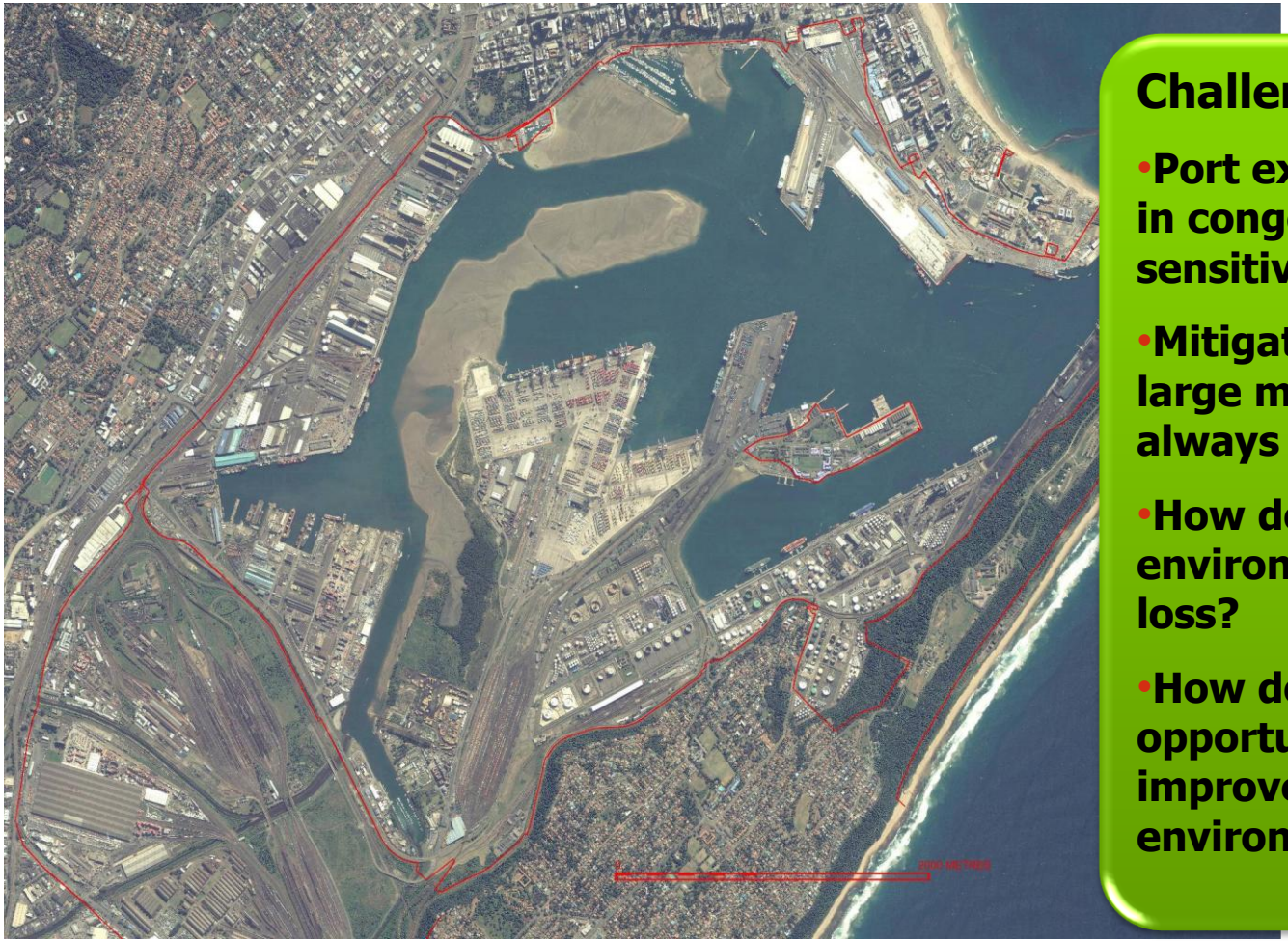
Capital projects life cycle process and environmental management tools (up to construction commencement)

Project Phase	Master Planning / Concept Dev FEL 0 - 1	Pre-feasibility Development FEL 2	Feasibility Engineering FEL 3	Implementation FEL 4
Environmental planning and management tools	Strategic environmental overview Environmental issues included in Transnet Infrastructure Plan Environmental Screening studies Strategic Environmental Assessments Public and government engagement Inform Government planning frameworks	Env Risk Assessments Public and government engagement during planning studies on env issues Poverty and Social impact studies Sensitivity studies Ensure alternatives selected during FEL2 meet env standards Cumulative impact assessment	Environ resource economics studies (natural capital and full cost accounting) Environmental Impact Assessments. Public & government engagements Environmental Management Plans Biodiversity Offsets Env friendly design Corporate Social Investments. Permits	Construction Environmental Management Plans Standards Environmental Specifications Project Environmental Specifications Method Statements Monitoring, auditing and reporting Public & government engagements to report on compliance during construction

Capital project life cycle process and environmental management tools (operations and closure)



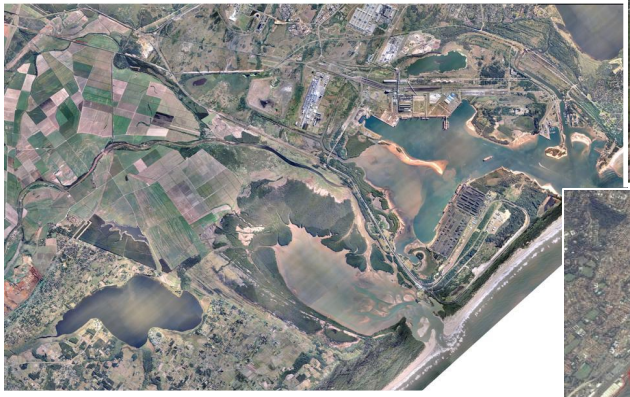
Innovative solutions for sustainability
Environmental Resource Economics studies of ecosystem services



Challenges

- **Port expansions needed in congested and sensitive port areas**
- **Mitigation of impacts of large mega projects not always possible**
- **How do we cost the environmental impact or loss?**
- **How do we explore opportunities for improvement to environment?**

Innovative solutions for sustainability
Environmental Resource Economics studies of ecosystem services



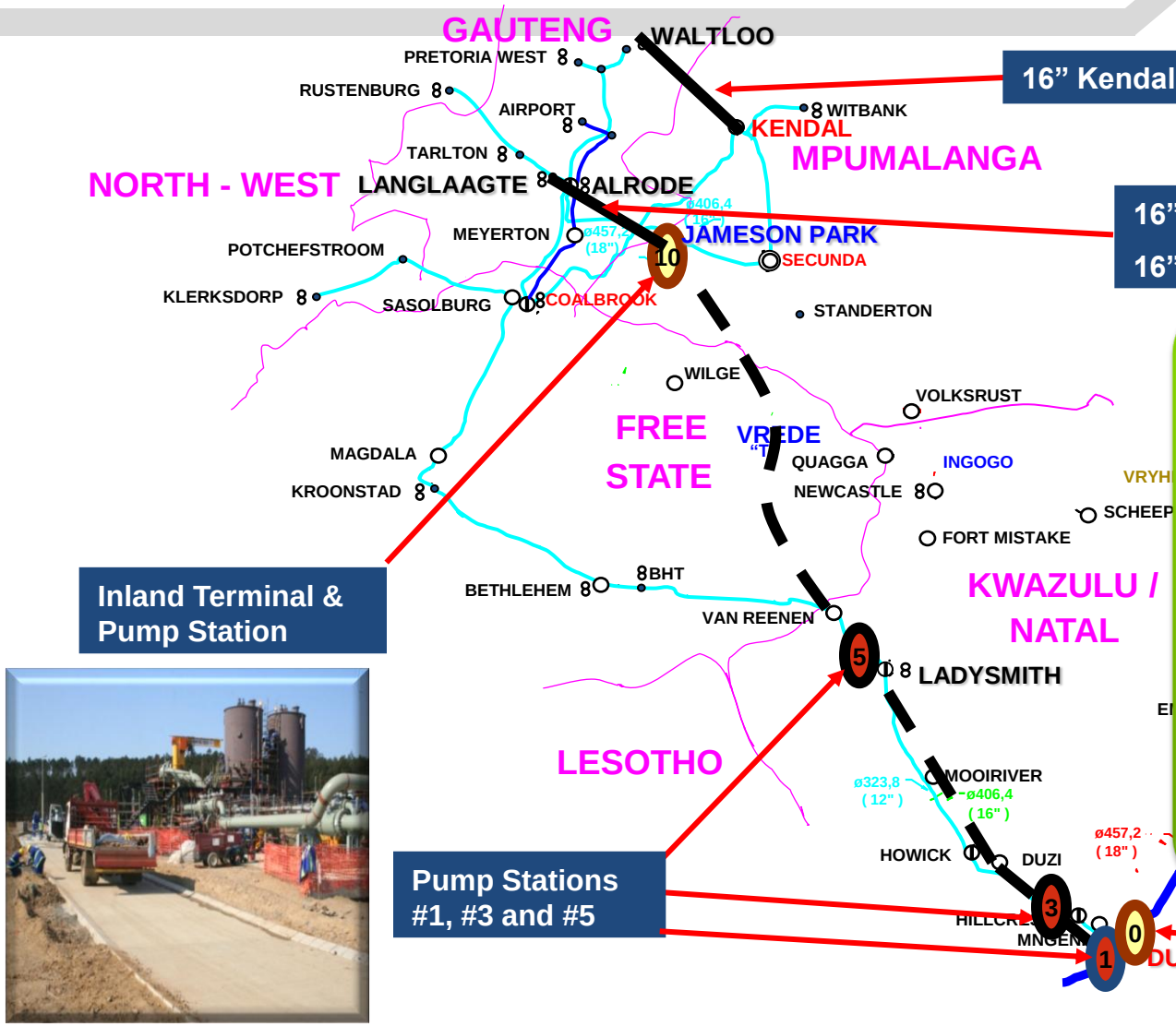
"Ecosystem services" as applied in the Millennium Ecosystem Assessment: ecosystems incorporate assets that yield a flow of services of benefit to people:

- **provisioning services (production of foods, fuels, fibres);**
- **cultural services (non-consumptive recreation, amenity, spiritual); and**
- **regulating services (absorption of pollutants, storm buffering, erosion control).**

Solutions

- **Determine value of ecosystem services**
- **Determine loss due to development/ project**
- **Determine value of the discounted net benefits of each development option**
- **Explore options for habitat improvements and creation: invest in these.**

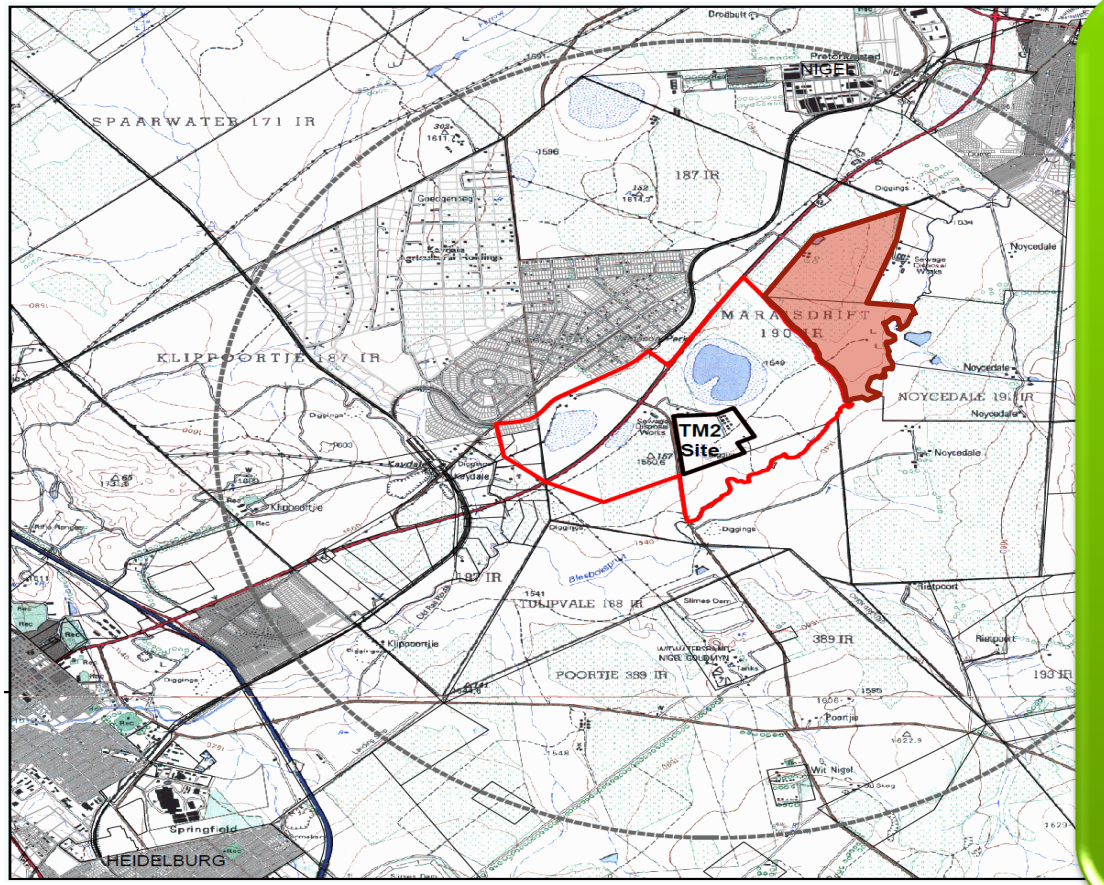
Innovative solutions for sustainability
New Multi Products Pipeline



Context

- DJP being replaced
- 555km of new 24” pipeline
- 160km of new 16” pipeline
- Pump stations along route and at each terminal
- Coastal Terminal
- Inland Terminal

Innovative solutions for sustainability
New Multi Products Pipeline



Challenges

- **Environmental Authorisation required biodiversity offset for Terminal 2. In absence of mitigation, impact on fauna & flora will be highly significant, especially for:**
- **endangered veld types**
- **two critically important species (frogs and owls)**

Recommended that a Conservation Offset be established

Innovative solutions for sustainability
New Multi Products Pipeline

- **Biodiversity offs**
  - conservation
    - intende
      develop
    - so as to
  - measurable
    - that res
      impacts
    - after ap

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- **The need to con**
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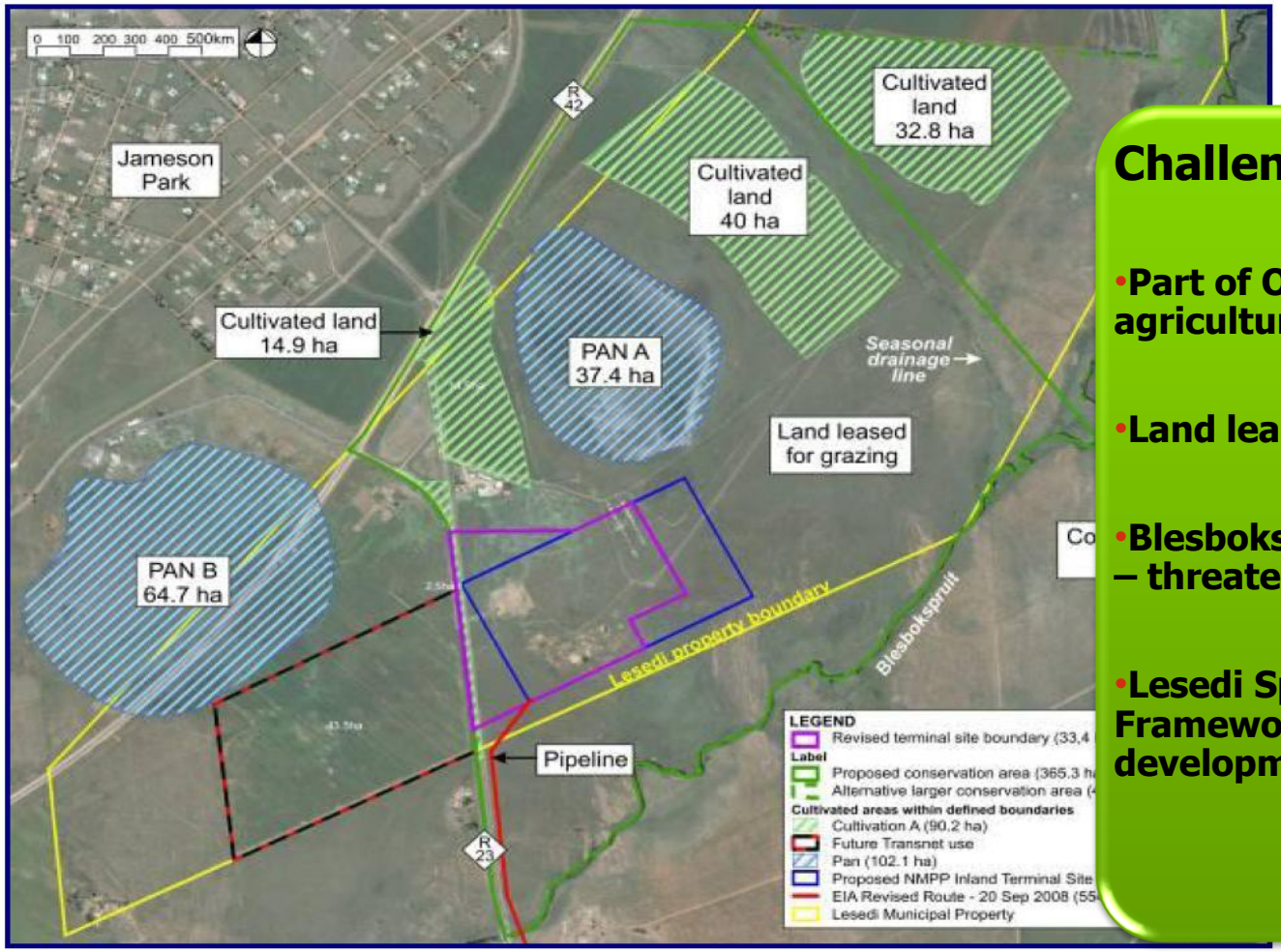
esidual biodiversity

- **Biodiversity offsets are a last resort impact mitigation option; and**
  - **only considered as a mechanism for compensating for residual biodiversity impacts, after a developer has proven that reasonable and responsible actions have been taken to avoid, minimise and mitigate biodiversity impacts resulting from a proposed development.**

Innovative solutions for sustainability
New Multi Products Pipeline



Challenges

- **Part of Offset area utilised for agricultural purposes**
- **Land leased for grazing**
- **Blesbokspruit Highveld Grassland – threatened ecosystem**
- **Lesedi Spatial Development Framework and future development pressure**

FIGURE 7-8: *Proposed land acquisition for conservation offsets*

Innovative solutions for sustainability
New Multi Products Pipeline

Layout of mitigation dykes and drift fence to protect migratory bullfrogs

Solutions

- **University of the North West appointed to develop the proposal for this offset**
- **Engagement with:**
  - **Local municipality**
  - **Local communities**
  - **Environmental authorities**
  - **NGOs**
- **Studies on frogs' migratory routes**

Innovative solutions for sustainability
New Multi Products Pipeline

Solutions

- **Mitigation measure used on site to protect the giant bullfrog from entering the construction site: fence constructed.**

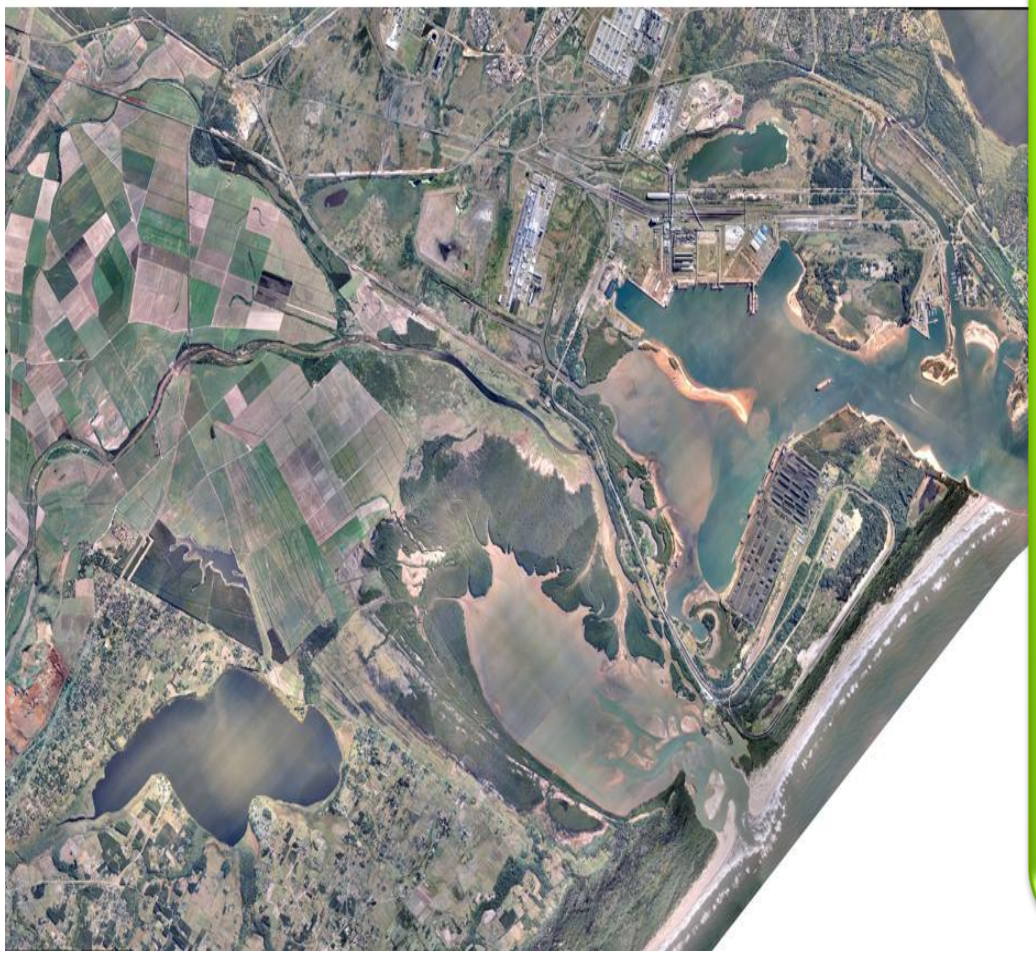
- **Fence is closely monitored daily. Should any frogs get around the obstacle, they are safely relocated from the construction area.**

Innovative solutions for sustainability
New Multi Products Pipeline

Solutions

- **Measures taken to protect wetlands during construction**
- **Measures taken to protect topsoil for re-use**

Innovative solutions for sustainability
Erosion control at Berth 208, Port of Richards Bay



Context

- **Port of Richards Bay is a sensitive environment**
- **Expansion of port required**
- **eChwebeni Natural Heritage site site next to new bulk liquid berth (Berth 208)**
- **Few places in country where white, black and red mangroves co-exist**

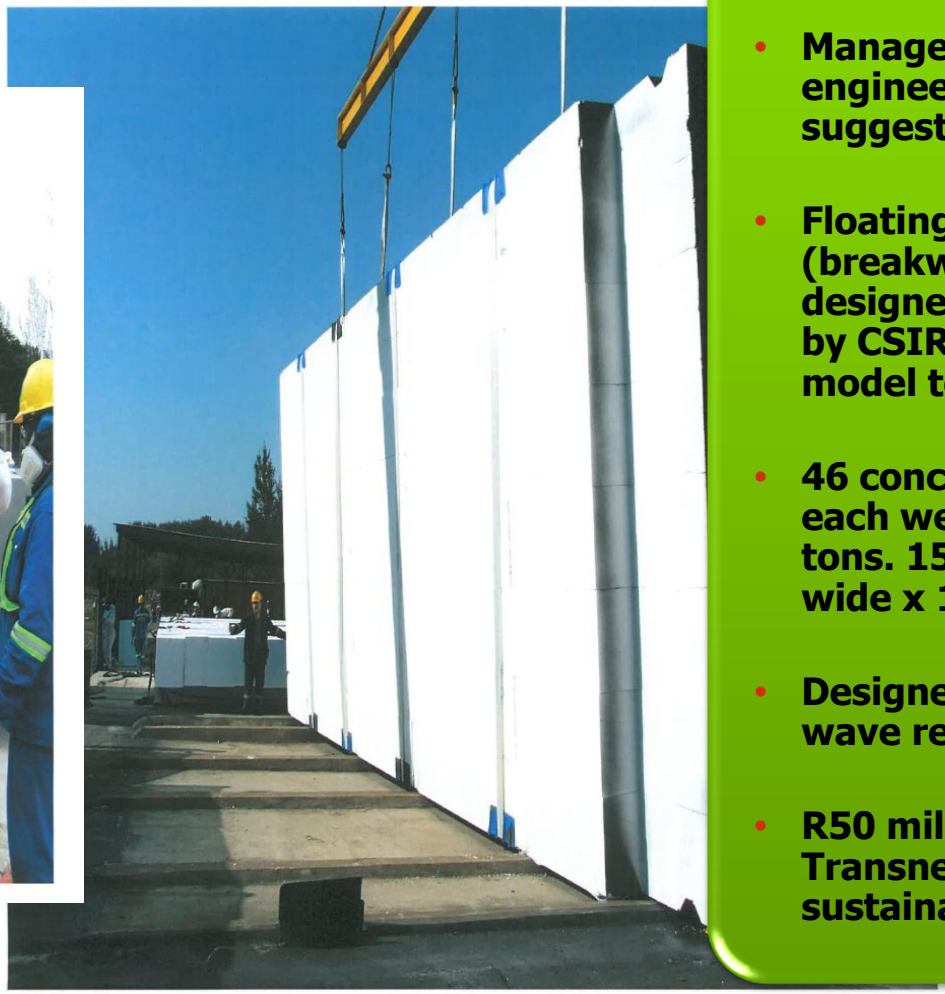
Mangroves: Woody plants that grow at the interface between land and sea in sheltered and lagoonal waters in tropical and sub-tropical latitudes

Innovative solutions for sustainability
Erosion control at Berth 208, Port of Richards Bay

Challenge

- **Shoreline erosion an existing problem**
- **Tug movement contributes significantly to erosion at ecologically sensitive heritage site leading to loss of mangrove area**
- **Environmental Authorisation suggests that solution be found – not prescriptive**
- **To develop a solution to mitigate the impact of wave energy along Berth 208 and allow tidal interchange**

Innovative solutions for sustainability
Erosion control at Berth 208, Port of Richards Bay



Solutions

- **Management and engineering solutions suggested**
- **Floating Pontoons (breakwater system) designed after studies of by CSIR and WSP and model tested**
- **46 concrete pontoons each weighing about 63 tons. 15m long x 5m wide x 1.5m deep**
- **Designed for 70–80% wave reduction**
- **R50 million invested by Transnet to ensure sustainability**

Innovative solutions for sustainability
Erosion control at Berth 208, Port of Richards Bay

Lessons learnt

- **Environmental risk assessment up front essential**
- **Project must budget for environmentally friendly solutions**
- **Best solution not always cheapest**
- **Go beyond compliance**
- **Best practice integral to project management and each phase of project life cycle**

Innovative solutions for sustainability
Port of Ngqura

Context and Challenge

- **Port of Ngqura is located in some of the most sensitive environments in South Africa and is surrounded by large undisturbed natural areas.**
- **Various naturally occurring raptors and other predators, including some Red Data species are present.**
- **Environmental Authorisation required that rodents (from incoming ships etc) be controlled.**
- **Rodents are plague carriers affecting human health; considered to be predators posing a threat to the existence of endangered bird species inside the Port and on the nearby Jahleel Island**

Innovative solutions for sustainability
Port of Ngqura

Solutions

- **Transnet implemented the first ever poison-free system for monitoring and controlling rodents inside an international Port of Call in 2008.**
- **Transnet appointed the Urban Raptor Project to implement this rodent monitoring and control system.**
- **Since commencement, 12 Spotted Eagle Owls, eight Rock Kestrels, one Peregrine Falcon and ten Barn Owls have been reintroduced to the Port area by the Urban Raptor Project.**
- **In this time, rodent population numbers have dropped to natural state.**

Thank you.

Targeting Sustainability in all we do.