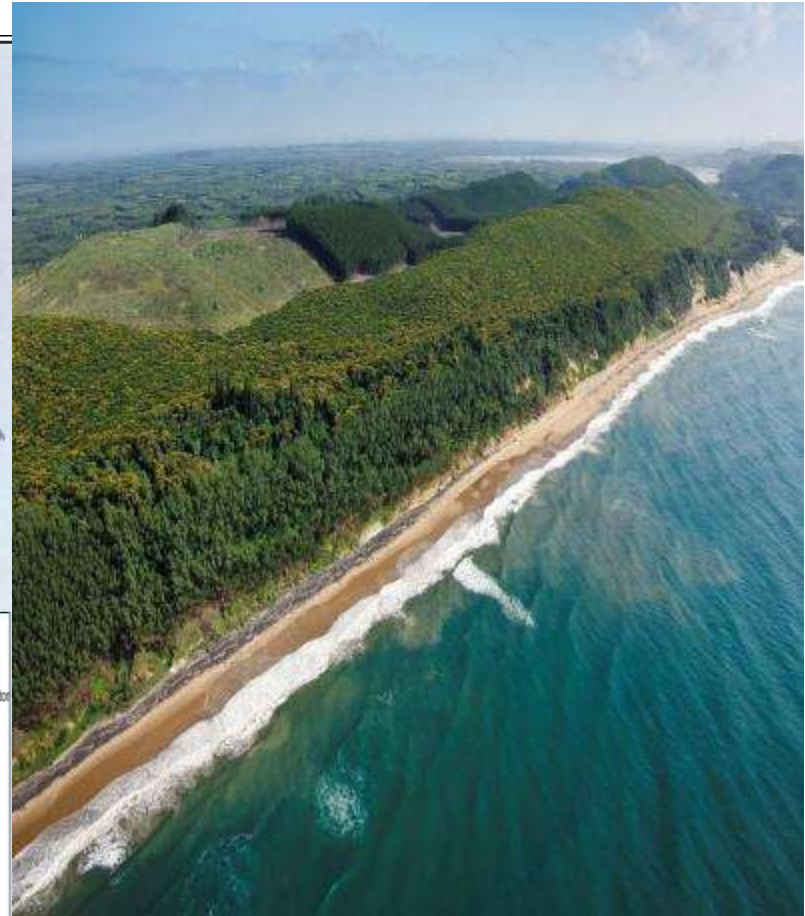
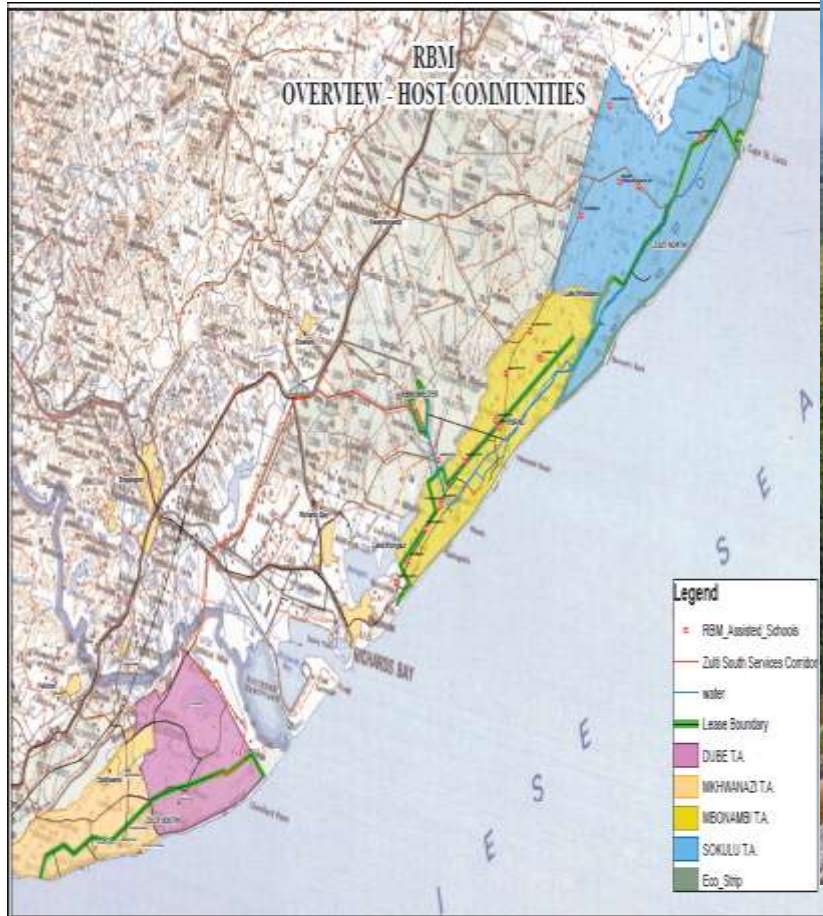


Mining in the Sand Dunes of Richards Bay, South Africa



Mineral Sands Overview

Formation of Dunes

- Presence of heavy mineral sands – 1920
- Detailed Exploration - 1971
- Weathering / transport of host rock inland
- Transport up coast
- Deposit on the beaches
- Blowing of sand onto dunes by onshore winds
- Complex ore bodies

Heavy Mineral Concentrate in Sands



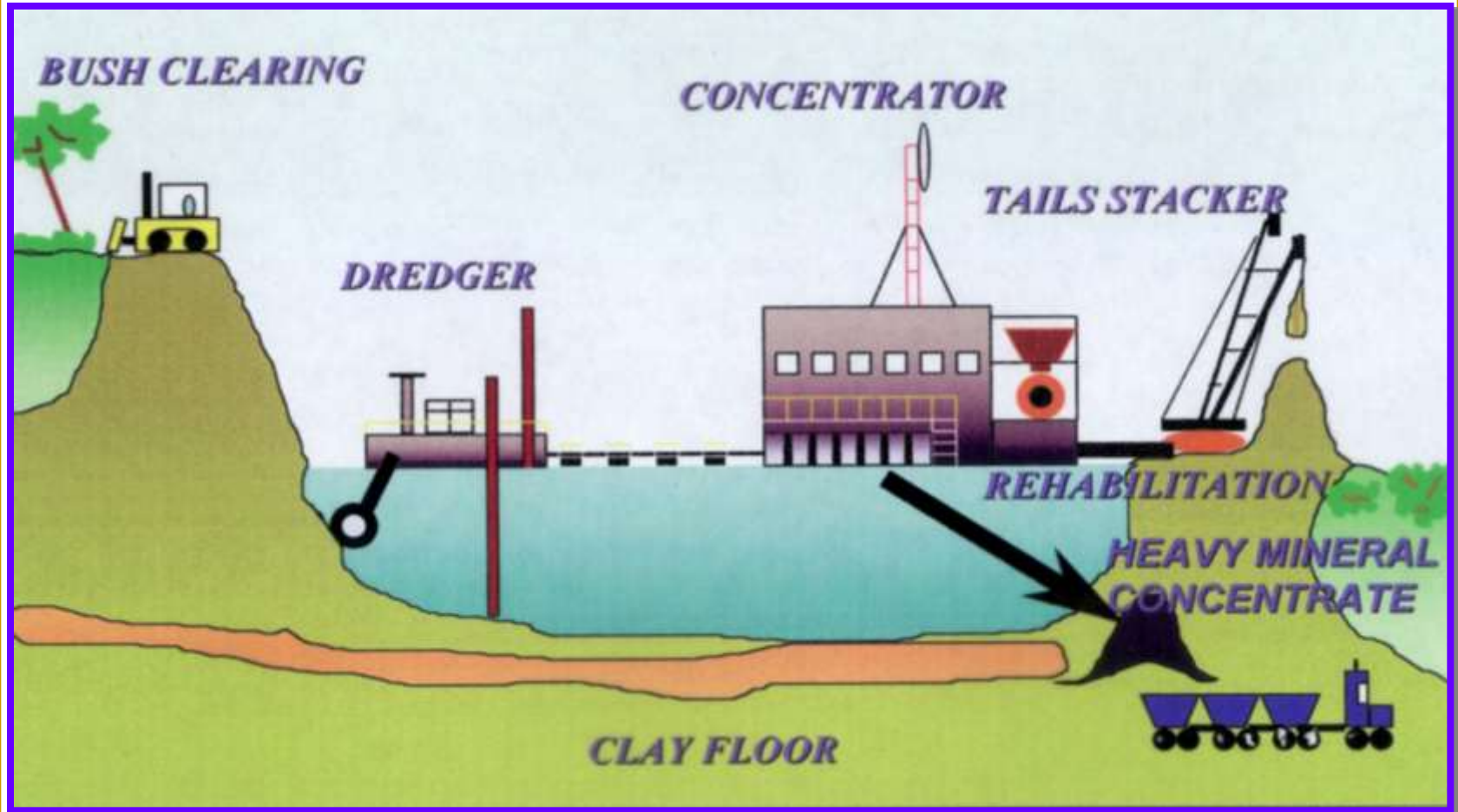
Richards Bay Minerals (RBM)

- RBM operations started in 1977 followed by staged expansion
- 4200 employees
- Low cost, high volume producer ~ 40 million tonnes of ore
- Produces two million tons of product a year
 - 25% of the world's titanium slag
 - 33% of the world's zircon (~250 000 tons)
 - Rutile
 - 25% of high purity iron

RBM Products

Titanium Slag	Rutile (titanium metal)	Zircon Zirconium	Pig Iron (smelting)
Brilliance and opacity	Welding rod fluxes	Ceramic tiles	Raw material for foundries
Paints, plastics, paper	Aerospace/aviation industries	Sanitary ware	Ductile iron castings
Luminescence to Smart phones, tablets	Artificial hip joints	Jewellery	Brake callipers
Kitchen appliances	Pace makers	Refractories Electronic Application	Steering knuckles cars/trucks

RBM Mining Process



RBM Mining Ponds



Mining Pond E

Mining Pond D

Mining Pond C

Mining Pond A

Infra Structure and Support Services

Water – Supply and Seepage Control



Roads, Power



Environmental Management

Rebuilding/Reshaping Dune



Rehabilitation New Plantation



Processing and Beneficiation



- Mineral separation
- Roasting
- Smelting
- Slag and iron processing
- Shipping Logistics

Lessons Learnt

- Strongly unionised work force
- Strong community relations – impacts of mining and
- Integration into local community
- Safety of paramount importance
- Enjoy the experience

Thank you



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