

“Where will our knowledge take you?”

Toliara Port Options Study and Pre-Feasibility Study

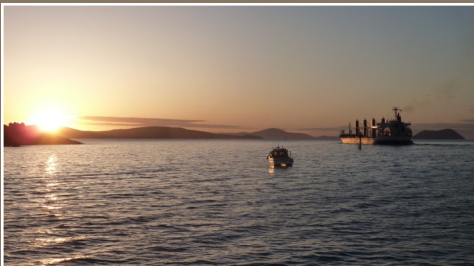
World Titanium Resources



“ For a proposed offshore shipping terminal in Madagascar for export of 500,000 tonnes of mineral sands per annum, BMT JFA developed concept engineering designs, project planning, and a feasibility study ”



The port options included concepts for direct material loading to handy size bulk carriers, as well as for transhipping the material from shore via barges to a geared vessel moored a short distance offshore.



With consideration of the local and historical met-ocean conditions and coastal processes, BMT JFA developed economical engineering solutions for jetty construction. The jetty options were designed in order to reach sufficient water depths for ship berthing and/or barge landing.



For transhipment feasibility and logistics, BMT JFA developed estimates of barge loading and transfer operations for comparison to direct loading options. While some capital cost savings can be achieved using transhipment options, the test is whether the increased annual costs and operational limits are acceptable to the project.

BMT JFA also undertook full project programming, investigated container-handling at the facility, identified minimum

ship navigation and manoeuvring dimensions, and liaised with local and regional contractors for provision of on-site investigations to identify geotechnical, met-ocean and bathymetric design conditions.

BMT JFA also developed capital and operational cost estimates for various options, undertook value engineering of the design to identify cost-saving solutions, and provided option-by-option projections of total expense over the life of the facility.

BMT JFA Role

- Facility siting and review of site geotechnical, met-ocean conditions
- Review of barging efficiency and operations
- Development of earthworks, jetty and wharf designs including trestles and armoured causeways
- Development of CAPEX and OPEX estimates with total cost projections

Services & Expertise Provided

- Barging and transhipment studies
- Concept engineering for ship wharf, barge landings, trestles and causeways
- Entrance channel and turning basin design
- Economic and operational assessments
- Identification of key project constraints and risks

Location

Madagascar

Date

2012—ongoing