

SPECIALIST STUDIES

- **Socio-economic Impacts**

Social

Economic

Noise

Visual

Heritage and cultural resources

Waste

Tourism

Agriculture

Transport



SPECIALIST STUDY RESULTS

- **Seismic Risk**

Seismic studies indicate that the design basis for the respective sites in terms of peak ground acceleration values (PGA) are as follows:

- Duynefontein – PGA ~0.30 g
- Bantamsklip - PGA ~0.23 g
- Thyspunt - PGA ~0.16 g

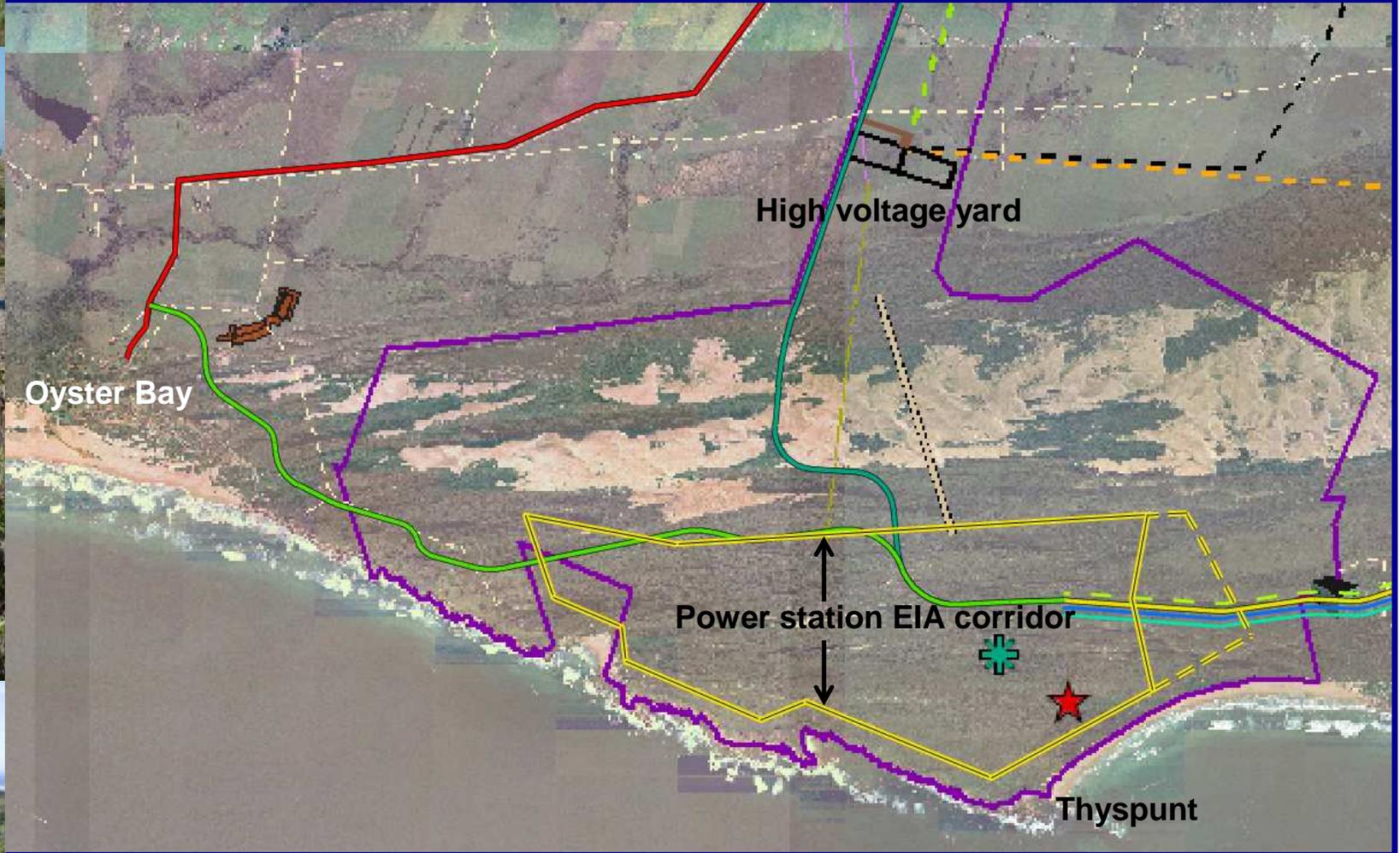


SPECIALIST STUDY RESULTS

- Impacts on Dune Geomorphology and associated geo-hydrology (landforms, sand and water movement)
 - Groundwater does not 'daylight' at **Duynefontein** and **Bantamsklip** sites: access roads and transmission lines can be built across the mobile dunes
 - The interaction between dune systems and wetlands is complex at **Thyspunt**, since groundwater 'daylights' in many inter-dune areas
 - Haul roads and conveyor belts through Oyster Bay dunefield at **Thyspunt** between the nuclear power station and the HV yard, may cause more significant dune geomorphology impacts than at the other two sites



Impacts on Dune Geomorphology



SPECIALIST STUDY RESULTS

- **Impacts on Flora (plants)**
 - **Bantamsklip** will experience the least potential negative impact on plant communities and species - the ecosystems on this site are fairly common along this section of coastline
 - **Thyspunt** has the greatest diversity of vegetation communities (nine), including extensive and highly sensitive wetlands (6 of the 9 communities)
 - 383 plant species and low rare species count
 - Low endemism
 - Habitat resilience low for dunes, limestones and wetlands
 - Important headland bypass dune system



SPECIALIST STUDY RESULTS

- Impacts on Wetlands

- Development of a nuclear power station at **Duynfontein** is unlikely to result in any unmitigable, highly significant negative impacts on wetlands
- Development of the proposed nuclear power station at **Bantamsklip** would not be associated with any unmitigable impacts to wetland systems
- **Thyspunt** wetland systems are complex and potential negative impacts could occur without appropriate mitigation
- Additional monitoring in process to confirm assumptions about groundwater impacts on wetlands





THYSPUNT WETLANDS



Eskom Proposed Nuclear-1 Power Station and Associated Infrastructure: Wetlands on site Thyspunt

Legend

-  HVY Corridor
-  EIA corridor
-  Wetlands



1:50,000



SPECIALIST STUDY RESULTS

- Impacts on Terrestrial Vertebrates (mammals and birds)
 - Amount of land that is not of high faunal sensitivity at **Duynfontein** is more than sufficient for the nuclear power station
 - At **Bantamsklip** the nuclear power station could have significant negative potential impacts, without mitigation, because of the impacts on faunal habitats within the footprint
 - At **Thyspunt** a nuclear power station would have significant potential negative impacts, without mitigation, because of the potential impacts on faunal habitats within the footprint, the development of two access roads and proposed infrastructure across the dunefield



SPECIALIST STUDY RESULTS

- Impacts on Terrestrial Invertebrates (insects)
 - Potential impacts on terrestrial invertebrate communities are similar for all alternative sites, with site-specific differences
 - **Duynefontein:**
 - None of the butterflies are endangered or endemic
 - Low to very low overall insect sensitivity
 - New species of ant found is regarded as a generalist (likely to be found on other areas of the site)



SPECIALIST STUDY RESULTS

• Impacts on Terrestrial Invertebrates

- **Thyspunt** has the highest butterfly diversity and conservation value of the alternative sites
- From the viewpoint of potential positive impacts of the nuclear power station, **Duynefontein** already positively benefits under the management of Eskom, which means that it would experience the least improvement in conservation status
- **Bantamsklip and Thyspunt** would benefit substantially from formal protection status, resulting in a net positive impact on insect communities
- Additional site visits carried out in summer season



SPECIALIST STUDY RESULTS

- **Economic Impacts**

- Positive macro-economic impacts will be greatest at **Bantamsklip** and **Duynefontein** as the sites are situated in a province with a larger, more diversified economy. Nuclear-1 would result in less dislocation of economic activities if located at Duynefontein than at either of the other two sites
- Macroeconomic indicators favour **Duynefontein** and **Bantamsklip**
- Cost-effectiveness analysis indicates that **Thyspunt** is slightly favoured relative to **Duynefontein** and more favoured relative to **Bantamsklip**.
- The differences between the alternative sites are slight, and all the sites would have positive economic impacts both on the local area and the province in which they are situated
- The economic impact assessment gives greater weight to the cost-effectiveness analysis, which favours **Thyspunt**

SPECIALIST STUDY RESULTS

- Heritage Impacts (archaeological sites, cultural history and fossils)
 - All alternative sites contain significant heritage resources
 - **Duynfontein** is palaeontologically highly sensitive, but has less Stone Age heritage than **Bantamsklip** or **Thyspunt**
 - **Thyspunt** more sensitive than **Bantamsklip** in terms of its heritage richness – sites mostly along coast at all sites. 200 m setback line recommended to protect heritage sites
 - Cultural history issues – Gamtkwa Community



SPECIALIST STUDY RESULTS

Marine Biology Impacts

- Potential impacts similar at all sites and the impacts can be mitigated if the proposed designs are implemented as planned
- Potentially the most significant impacts are:
 - Disruption of the marine environment through the offshore disposal of sediment
 - Release of warmed cooling water
- Spoil disposal will have a potentially highly significant long-term negative impact on the marine environment within a localised area (3 km² initially to 6 km² [2 x 3 km] after 5 years) – acceptable impact according to marine specialist



SPECIALIST STUDY RESULTS

Marine Biology Impacts

- Impacts on Chokka fishing industry:
 - Chokka spawn at depths less than 50 m
 - Recommended that spoil must be released in depths more than 50 m (1.4 - 1.8 km offshore) and medium pumping rate
- Warm water release recommendations to aid heat dissipation:
 - tunnelled design
 - multiple release points
 - high flow rate
 - above sea floor



SPECIALIST STUDY RESULTS

Marine Biology Impacts

- Radionuclides such as Cesium (Cs-137) and Strontium (Sr-90) present in oceans alongside other elements since 1940s
- Background Cesium has been recorded at Koeberg before the power station was established - detected in mussels, sand mussels and fish below levels at which further investigation would be required
- Strontium not recorded in marine organisms at Koeberg
- Due to few organisms in which Cesium has been recorded, low concentrations and lack of Strontium, these nuclides have no detectable potential impact on marine organisms



SPECIALIST STUDY RESULTS

Social Impacts

- Potential negative impacts relate to accommodation for temporary workers during construction
- Potential positive impact is the provision of electricity and related benefits to the broader national and regional economies
- Perceived risks associated with nuclear incidents could potentially lead to a change in attitude and behaviour – reliable information is important
- Need for Eskom to agree with authorities on responsibility for infrastructure provision



SPECIALIST STUDY RESULTS

Tourism Impacts

- Communities at **Thyspunt** and **Bantamsklip** have expressed opposition to the proposed power station
- **Thyspunt** community highlighted the premium nature of the top-end coastal vacation destination
- **Bantamsklip** community emphasised the new and fragile nature of the developing tourism product and the local dependence thereon
- Some **Duynefontein** tourism stakeholders have personal objections to another power station, however they recognise the potential for increased business and promote a generally positive outlook for tourism



SPECIALIST STUDY RESULTS

Tourism Impacts

- Assessment takes account decline in nature-based tourism as well as an increase in business-related tourism associated with the proposed nuclear power station
- **Duynefontein** – limited potential impact during construction; potential 1.4% improvement during operation
- **Bantamsklip** - potential 5% positive impact during construction; a potential 8.6% improvement during operation
- **Thyspunt** – potential 7.9% negative impact during construction; 0% impact during operation



SPECIALIST STUDY RESULTS

Agricultural Impacts

- Agriculture around **Thyspunt** is based mainly on milk production (2008: R150 m per annum)
- Fynbos farming prevails at the **Bantamsklip** although there is some dairy as well as grape, beef, sheep and game farming (2008: R29 m per annum)
- **Duynefontein** is based on mixed farming (2008: R75 m per annum)



SPECIALIST STUDY RESULTS

Agricultural Impacts

- **Duynefontein** – no impact on agriculture during construction and operation
- **Bantamsklip** – negative potential impact of dust (construction). Potential of less than 5% increase in local market due to water limitations that restrict expansion
- **Thyspunt** – negative potential impact of dust (construction). Potential for 15% positive impact on production due to increased local market



PROJECT ALTERNATIVES

- **Location of the power station (i.e. site selection)**
- Forms of power generation
- Nuclear plant types
- **Layout of the nuclear plant**
- **Fresh water supply and utilisation of abstracted groundwater**
- Management of brine
- Intake of sea water
- **Outlet of water**
- Management of spoil material
- Access to Thyspunt
- **Waste**
- **No-development (i.e. 'No-Go')**

