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ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE EKO ATLANTIC SHORELINE PROTECTION AND RECLAMATION PROJECT- A SUMMARY

The Eko Atlantic Shoreline Protection and Reclamation Project will provide approximately 1000 hectares (ha) of high quality land for development within the heart of Lagos, Nigeria and will offer a long-term solution to the shoreline erosion problems at Victoria Island, Lagos.



**Coastal Protection and the Development of a Future Modern City in Lagos,
Nigeria.**

Project Location

South Energyx Nigeria Ltd (SENL) was specifically created to undertake the development of the Eko Atlantic Project. Key elements of the management structure of SENL have a distinguished track record in Nigeria for the successful completion of major construction and engineering works.

The Project site is located adjacent to Bar Beach, at Victoria Island, Lagos, within the Eti-Osa Local Government Area.



The Need for the Eko Atlantic Project

Protection: The shoreline of Victoria Island has retreated significantly over the past century. The main cause for this erosion began with the blocking of coastal sediment transport after the construction of two moles or breakwaters (between 1908 and 1912) at the entrance to the Port of Lagos. Coastal protection activity was frequently commissioned to reduce the erosion

threat to Victoria Island, including several nourishment schemes. However, those attempts only temporarily mitigated the erosion and there continued to be intermittent flooding in this coastal area. The erosion culminated in 2006, when the protective beach disappeared with resultant flood damage to the road infrastructure along Bar Beach. The images presented below illustrate the situation in 2006. With no action, highly valued areas of residential and commercial property would continue to have been threatened by intrusion of sea water. As such, following the 2006 incident, the coastline was protected by a sea revetment consisting of concrete X-block armour units

Additional Land: With an increasing population and aspirations for greater economic development, there is a strong need to provide additional, strategically planned urban areas within Lagos. However, space for this within the central areas of Lagos is heavily restricted. In response to the need for land for future development SENL developed the Project proposal to further protect Victoria Island with land reclamation of the area previously eroded and to protect it with a second sea revetment a mile and a half offshore. The Project is anticipated to bring significant economic benefits to the region through direct investment in the local economy, knowledge sharing and publicity for the Lagos.



Project Description

The reclamation works will form approximately 1000 ha of land which will be for the future development of a modern city. The new land will be realised using approximately 90 million m³ of sand, dredged offshore from the coast of Lagos State from the sea-bed of the Atlantic Ocean.

The main reclaimed area will be approximately 7.5 km long, with a width of 2.3 km on the western end, tapering to 0.5 km on the eastern end.

The outer edge of the reclaimed area will be protected from the sea by an approximately 8 km long rock revetment to provide shoreline protection to the new land and to Victoria Island.



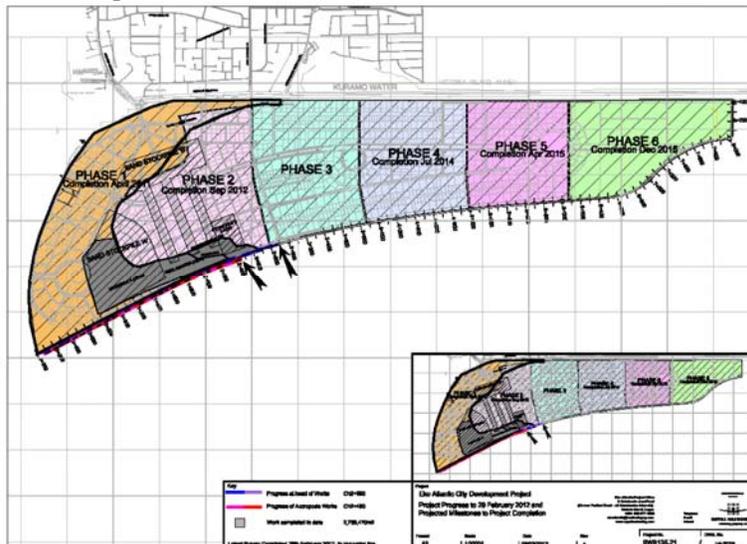


Project Development

The reclamation activities and associated works include the following tasks:

1. Dredging of sand for reclamation from offshore borrow areas;
2. Pre-construction – strengthening of the East Mole by quarry materials to enable use of the mole as an access road;
3. Construction of the sea defence, using several grades of quarry materials, geotextile fabrics and pre-cast concrete armour units; and sand placement for reclamation.

Dredging and reclamation works are carried out under the supervision of Haskoning Nigeria Engineering Consulting Ltd.



Environmental and Social Impact Assessment (EIA)

EIA is a tool for systematically examining and assessing the impacts and effects of a development on the environment. The resultant EIA report contains:

- A description of the development, including any alternatives considered;
- A description of the existing environment at the site and surrounding areas;
- A prediction of potential impacts on the existing human, physical and natural environment at the site and assessment of subsequent effects;
- A description of mitigation measures to avoid or reduce such effects;
- A description of monitoring requirements;
- A Non Technical Summary.

Scoping and Consultation

A scoping exercise was carried out to identify the main issues that needed addressing as part of the EIA. Following this, a report was prepared and the Terms of Reference for the EIA was agreed with the Federal Ministry of Environment (FMEnv), which is the body with national regulatory authority over this Project. This process included a site visit by the FMEnv and official registration of the EIA.

Consultation has been carried out throughout the EIA process. Consultations started during the scoping phase with meetings with FMEnv, Lagos State Ministry of Environment (LASMOE) and the Nigerian Ports Authority (NPA). Following these meetings the consultations were expanded to cover a wider range of stakeholders and local community leaders. Consultation and liaison with relevant parties will continue.

Baseline information

Extensive baseline studies have been completed to collect relevant information for the EIA. In line with Nigerian and International EIA best practice. The study has encompassed all areas within the potential impact footprint of the Project. Based on the Project location and activities, the following environmental and social parameters have been investigated:

- Meteorology;
- Coastal and sediment processes;
- Water and sediment quality;
- Groundwater;
- Air quality;
- Noise environment;
- Marine ecology;
- Terrestrial ecology;
- Socio-economic environment;
- Navigation;
- Fisheries;
- Cultural heritage; and
- Landscape character.

The baseline studies comprised desk based literature research on the above parameters and where data gaps were identified, field studies have been commissioned. This process has

helped to ensure that a comprehensive baseline environment could be established and used to incorporate within the EIA process. The studies included:

- Marine and lagoon sediment quality;
- Marine and lagoon water quality;
- Marine and lagoon benthic ecology;
- Marine and lagoon plankton ecology;
- Terrestrial ecology;
- Social (local communities) studies; and
- Social (economics) studies.

Impact assessment and Mitigation

A comprehensive impact assessment was undertaken by qualified international specialists using standard methods and techniques. Significance levels were assigned to each impact in order to provide a consistent framework for considering and evaluating impacts. The assigned definitions are set out in Table 1.

Table 1 Terminology for classifying environmental impacts

Significance	Definition
Major Adverse	The impact is large scale, giving rise to great concern. It may be considered unacceptable.
Moderate Adverse	The impact gives rise to some concern, but it is likely to be tolerable in the short-term.
Minor Adverse	The impact is small scale and of little concern, being undesirable but acceptable.
Negligible	The impact is so small that it is barely noticeable and is of no concern.
Minor Beneficial	The impact is small scale and of slight significance, providing some benefit to the environment.
Beneficial	The impact provides positive gain to the environment.
Major Beneficial	The benefit is large scale, providing a significant positive gain to the environment.

Where potentially significant adverse impacts were identified mitigation measures have been considered and are described, either as part of the design or as a measure implemented during construction or operation. Mitigation measures help to avoid or reduce potential significant impacts to acceptable levels. In addition, good practice measures are discussed where relevant and will be undertaken throughout the project.

Coastal environment

An assessment of the impact of the Project on hydrodynamics and geomorphology looked at the changes that the reclamation could have on the local waves, currents and the sediment transport regime. The Project will provide a long-term solution to the coastal erosion at Victoria Island.

However historical records confirm that coastal retreat had been continuing unabated over the past century regardless of Eko Atlantic. Eko Atlantic will not further contribute to the overall erosion along the entire shoreline East of the project. It should be noted that the alignment of the Eko Atlantic sea defence was engineered in such a way to allow the flow of sand to minimize the possibility of any erosion down the coast.

Land environment

The majority of construction activity for the Project would be restricted to the marine environment and therefore the potential for impact upon the terrestrial environment is limited. The study predicted that given the urban nature of the project area and extent of planned activities, that the effects on terrestrial ecology would be very low or none at all.

Water and physical

The reclamation and associated activities may cause disturbance to the local water quality, such as through increased suspended sediments in the water column or pollution through accidental spillages. However, the assessment predicted that following the implementation of best practice measures on site, effects would only be of a minor nature. The study also identified that effects on marine and lagoon ecology will be low.

Noise and Air Environment

Construction activity has the potential to disturb through the generation of noise. However, the results of the noise study for this Project indicate that noise from the delivery of rock for the sea defence will not result in a significant impact along the transport route. Furthermore, noise disturbance to coastal properties from reclamation machinery will be low and only experienced temporarily. Engine exhaust emissions from marine vessels involved in dredging works and engine exhaust emissions from vehicles and site machinery such as excavators, bulldozers and front loaders have the potential to affect local air quality. The main pollutants of concern from these emission sources are likely to be those relating to fuel combustion. However, the assessment for air quality has predicted that the effects would be negligible or minor and of a temporary nature.

Human environment

The Project has the potential to generate positive economic effects to the local and national economy. Positive effects would arise from employment and via the supply chain. In addition, the sharing of international knowledge and expertise with local workers is considered a positive effect of the Project. Predicted impacts on the majority of communities and businesses located near the coastline are anticipated to be of minor significance. Those stakeholders that may be most affected include the Kuramo Business Cabinsand, the fishermen and shell collectors living in the Oni-Jegi (I) and Igboere Apese communities. In the operation phase, it is foreseen that these communities and make-shift businesses can resume normal operation and even benefit from increased tourism. The luxury hotels and offices on Adetokumbo Ademola Street and the businesses on Ahmadu Bello Way are predicted to benefit significantly from the reclamation activity in the operation phase as the real estate value of their properties will increase.

The landscape is defined in this Project as views from the land out to sea. Given the scale and extent of the Project, it is inevitable that effects upon the surrounding landscape would be incurred. The visual effects arising from the presence of the new land would be greatest for the coastal properties of Victoria Island. Overall, the likely landscape and visual effects arising from the Project varies from property to property. However, impacts of this nature should be considered in reference to the coastal protection value afforded to these properties by the Project and the relatively low value of landscape character in Lagos.

Cumulative effects

In order to assess the cumulative effects of the Project on the environment, all other relevant Projects within the Eko Atlantic area were identified. Those Projects which would potentially impact upon the same receptors as the Eko Atlantic Project within the same time frame were selected for review. The overall conclusion was that the Project would not significantly contribute to in-combination effects within the Study Area.

Environmental Management and Monitoring Plan

A comprehensive Environment Management and Monitoring Plan (EMMP) has been established. The purpose of the EMMP is to:

- Establish a comprehensive framework for environmental management during all Project phases;
- Describe roles and responsibilities of the various individuals and organisations involved in environmental management;
- Provide an implementation process for the mitigation measures;
- Provide a system for reporting and management of environmental data;
- Specify strategies to promote sustainable development, waste management, pollution control and reuse, recovery and recycling.; and
- Enable compliance with legislative requirements.

As part of the EMMP, monitoring programmes have been prescribed where necessary, which would take place either during or post construction, in order to verify predicted impacts and enable management actions where necessary.



Progress To Date

The Eko Atlantic Project has completed a full and comprehensive Environmental and Social Impact Assessment (EIA), as required under the Nigerian Environmental Impact Assessment (EIA) Act No. 86 of 1992. The EIA has been carried out in accordance with these regulations.

The EIA underwent several public consultations and was submitted to the Federal Ministry of Environment in November 2011. In January 2012 the Nigerian Federal Ministry of Environment gave EIA Approval to Eko Atlantic's submissions in combination with a number of agreed follow-up actions including implementation of the Environmental Management and Monitoring Plan.