PROJECT : SNIM PROJECT TO DREDGE THE NOUADHIBOU ORE PORT FAIRWAY
COUNTRY : MAURITANIA

SUMMARY OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

Project Team

<table>
<thead>
<tr>
<th>Position</th>
<th>Name</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Team</td>
<td>Ousmane FALL, Investment Officer, PISD1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fernando RODRIGUES, Investment Officer, PISD1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Pierre Hassan SANON, Social Development Officer, RDGN4/SNSC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Salim BAIOD, Consultant Environmental Specialist, SNSC</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Omotola AWOJOB, Consultant Modeler, PISD1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mouna DIAWARA, Credit Risk Officer, PGCR2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gilles Corneille YAMEOGO, Principal Legal Advisor, PGCL2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Olivia Mutambo MPATSWE, Consultant, PGCL2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sandrine Moriehnikey ALISSOUTIN, Economist, ECMR2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mansour HAMZA, Financial Analyst, FIST2</td>
<td></td>
</tr>
</tbody>
</table>

Director General

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mohamed EL AZIZI</td>
<td>RDGN</td>
</tr>
</tbody>
</table>

Sector Director

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kodeidja DIALLO</td>
<td>PISD0</td>
</tr>
</tbody>
</table>

Manager

<table>
<thead>
<tr>
<th>Name</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mahib CISSE</td>
<td>PISD1</td>
</tr>
</tbody>
</table>

August 2017
1 INTRODUCTION

The National Industrial and Mining Company (SNIM - Société Nationale Industrielle et Minière) has asked the African Development Bank Group to co-finance the Project to Dredge the Nouadhibou Ore Port Fairway in Mauritania.

In accordance with Mauritania’s environmental and social requirements and the AfDB’s Integrated Safeguards System (ISS), the project is subject to an environmental and social impact assessment. The project is classified under environmental and social category 1, and a summary of its Environmental and Social Impact Assessment (ESIA) must be published on the Bank’s website.

This document is a summary of the project ESIA written in June 2017. It includes: (i) the project description and justification; (ii) the country’s legal and institutional framework; (iii) a description of the project’s main environmental conditions; (iv) the options considered in terms of technical, economic, environmental and social feasibility; (v) identified inevitable environmental and social impacts during the preparation, construction and operation phases of the fairway; (vi) measures to increase benefits and/or prevent, minimise negative impacts; and (vii) the monitoring program. Public consultations are presented as well as additional initiatives related to the Project. The conclusion presents the project’s acceptability.

2 PROJECT DESCRIPTION AND JUSTIFICATION

SNIM has operated the ore port in Nouadhibou, the economic capital of Mauritania, located 465 km north of Nouakchott since 1961.

All ore mined by SNIM passes through this port and is transported by train from Zouérate. In 2014, this came to more than 13 million tons of ore, and SNIM aims to increase its exports to become a leader in iron production.

In 2012, SNIM built a new ore port with the nominal capacity of 10,000 T/h and the means to accommodate vessels up to 250,000 T. Access to ships to SNIM-operated ore ports and the oil platform is through a fairway, regularly maintained to allow the passage of vessels with draughts of up to 16.15 m.

The purpose of the access fairway dredging project is to allow vessels with capacities of up to 250,000 T to access the new loading dock. This project will require construction work to deepen and widen the existing access fairway and the turning basin at the SNIM ore port in Nouadhibou. This is vital for the operation of the port. It is an operation that involves dredging the seabed in order to improve access of vessels to the port. Therefore, this requires appropriate management of the extracted sediment. A 2015 feasibility study retained the solution of dumping (discharge) in the marine environment.

The estimated cost of the project is USD 130 million, i.e. EUR 110.65 million, with expected funding of USD 55 million from the EIB, USD 65 million from the AfDB and USD 10 million in equity financing.

3 APPLICABLE LEGAL FRAMEWORK

3.1 INSTITUTIONAL FRAMEWORK IN MAURITANIA

The Ministry of the Environment and Sustainable Development, in particular through the Directorate of Environmental Control (DCE) and the Directorate of National Parks (DPN), is charged with addressing environmental issues in Mauritania. The DCE includes the Environmental Assessment Service, as well as the Standards and Compliance Department.
Other entities involved in the project include: (i) the National Industrial and Mining Company (SNIM); (ii) the Ministry of Fisheries and Maritime Economy; (iii) the Ministry of Petroleum, Energy and Mines; (iv) the Ministry of Commerce, Industry, Handicrafts and Tourism; and (v) the Ministry of Economic Affairs and Development.

3.2 **Regulatory Framework Applicable in Mauritania**

Several laws, ordinances and other texts may be applied to the dredging project at the Nouadhibou ore port:

(i) Framework Law on the Environment No. 2000-045, adopted in July 2000, aims to establish the general principles that should underpin the national policy on environmental protection and serve as a basis to harmonise ecological imperatives with sustainable economic and social development requirements.

(ii) Decree 2004 - 094 of 04 November 2004 on Impact Assessment, amended and supplemented by Decree 2007 - 105. The decree is issued pursuant to the provisions of the Environmental Code with regard to the implementation of Environmental Impact Assessments (EIA). In Article 2, it defines the EIA as a document to assess, appraise and measure the direct, indirect and cumulative environmental effects of a project in the short, medium and long term.

(iii) Ordinance No. 2007-037 on the planning, protection, management and development of the coastline. Its purpose is to define the rules relating to the planning, protection, management and development of the coastline.

(iv) Law No. 2000-025 establishing the Fisheries Code - Management of the fishery resources of waters under Mauritanian jurisdiction considered national heritage.

(v) Law No. 95-009 on the Merchant Marine Code and Decree No. 99-05 on the conditions for the exercise of maritime professions and prerequisites to practice a maritime profession.

(vi) Decree No. 99-146 concerning seafarers - rules relating to work aboard ships (manpower, wages, organisation of work, etc.).

(vii) Decree No. 84-163 B regulating maritime traffic and the Council responsible for its supervision.

(viii) Law 2010-033 of 20 July 2010 on the Code on Crude, which lays down the regulations governing oil and gas exploration.


(x) Decree No. 2010-010 / PM of 28/01/2010 creating security areas at the Nouakchott and Baie du Lévrier ports in Nouadhibou.

3.2.1 **International Conventions**

Mauritania is signatory to many international conventions on the environment, including those on climate change and biodiversity, such as:

(i) The United Nations Framework Convention on Climate Change

(ii) The Convention on Biological Diversity

(iii) The Convention for Cooperation in the Protection, Management and Development of the Marine and Coastal Environment of the Atlantic Coast of the West, Central and Southern Africa Region

(iv) The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

(v) The International Convention for the Prevention of Pollution from Ships

(vii) The Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (MARPOL) and its annexes, prepared within the framework of the International Maritime Organization

(viii) Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR Convention)

Mauritania has also acceded to International Labor Organization (ILO) conventions that have an impact on SNIM's activities and the project.

Most of the conventions mentioned above do not include direct rules or standards for dredging work, but they are important in the context of SNIM's activities and the work envisaged.

3.2.2 AfDB Requirements and International Standards

To implement the dredging project for its port fairway, SNIM must meet the requirements of the Integrated Safeguards System (ISS) 2014 for the African Development Bank’s (AfDB) Environmental and Social Assessment Procedures (ESAP). The ISS comprises five operational safeguards (OSs) which are:

- **Operational safeguard 1 – Environmental assessment**: This operational safeguard is triggered by the fact that this investment project is de facto subject to an environmental and social assessment;

- **Operational safeguard 2 – Involuntary resettlement**: This operational safeguard is triggered by the fact that the project will lead to expropriations;

- **Operational safeguard 3 – Biodiversity, renewable resources and ecosystem services**: This operational safeguard is triggered by the fact that the project will take place in a marine environment, which in turn will affect the Itchkeul Park - a sensitive site in terms of biodiversity or ecosystem service;

- **Operational safeguard 4 – Pollution prevention and control, hazardous materials and resource efficiency**: This operational safeguard is triggered by the existence of a risk of pollution and various nuisances during the works;

- **Operational safeguard 5 – Labour conditions, health and safety**: This operational safeguard is triggered by the existence of risks to the health and safety of workers during the execution of work in connection with on-site operations.

Other relevant AfDB policies and guidelines remain applicable as soon as they are triggered under the ISS. These are, primarily:

- The Bank’s Gender Policy (2014);
- Framework for Enhanced Engagement with Civil Society Organizations (2012);
- Disclosure and Access to Information Policy (2012);
- Handbook on Stakeholder Consultation and Participation in AfDB Operations (2001);
- The Bank’s Policy on Population and Strategies for Implementation (2002);
- Environmental and social assessment procedures for Bank operations (2015).

Mauritania adheres to many international conventions on the environment, including those on climate change and biodiversity.

Mauritania has also acceded to International Labor Organization (ILO) conventions that have an impact on SNIM's activities and the project.
International best practices for sediment management are based on the OSPAR Convention for the Protection of the Marine Environment of the North-East Atlantic. It has defined the Guidelines for the Management of Dredged Materials, which mentions: (i) Complete analysis of dredged sediment; (ii) Establishment of reference thresholds to assess hazardous sediment; (iii) Management methods for material; (iv) Selection of the dumping site at sea.

Given the absence of reference standards in Mauritania for sediment quality (currently being prepared), French regulations and the French reference levels were used.

4 DESCRIPTION OF THE PROJECT ENVIRONMENT

4.1 PROJECT IMPACT AREA

The ESIA of the dredging project must cover all elements of the marine and coastal environment that may be affected directly or indirectly by dredging activities or fairway operations.

Accordingly, the project area includes: (i) the project’s Direct Right-of-Way, which corresponds to the mineral port, the 25-km long fairway and the dumping areas, (ii) a wide Impact Zone extending beyond the project’s direct right-of-way.

The project area therefore includes:

- To the North: the Cap Blanc Peninsula, including the area in the Western Sahara
- To the East: La Baie du Lévrier up to Nouadhibou (part of the Nouadhibou Free Zone)
- To the West: The boundary of the Mauritanian Exclusive Economic Zone
- To the South: The Northern part of the Banc d’Arguin.

Figure 1: Area covered by the study and National Parks.

4.2 CHARACTERISTICS OF THE AREA

Physical Environment

The Cap Blanc Peninsula has a desert climate (hot and dry). However, it is more moderate than in the continental zone thanks to sea winds and currents. This results in milder temperatures and lower thermal amplitudes. Temperatures vary on average between 14°C and 31°C depending on the seasons and years, with a daily variation of about 10°C.

The effects of climate change in Mauritania include prolonged periods of drought. In general, average air temperatures have increased in Mauritania over the past 30 years: Annual rainfall averages 42.4 mm in Nouadhibou for approximately 4.8 days. The zone is also typically windy. In the morning, winds come from the North and Northeast, steadily intensify and the direction gradually changes from North to Northwest. Intensity varies from 12 to 38 km/h.

Oceanic surface temperatures range from 18.10°C south of Cap Blanc to 25.80°C in the Baie du Lévrier. Cold waters (upwelling waters) were measured at four stations.

Three specific zones with respect to the swell are identified: (i) the inner fairway, ≤ 1.2 m, (ii) the passage of Cap Blanc and part of the outer fairway 0.75 m ≤ Hs ≤ 1.5 m, (iii) and the other part of the outer fairway up to 2.25 m.
The tide is semi-diurnal, with an amplitude in the range of 1.5m to 2.0m during spring-tide periods and 0.5 to 1.0 m in neap-tide periods. Salinity varies between 35.7 PSU within the Baie du Lévrier and 36.5 PSU south of Cap Blanc. The concentration of dissolved oxygen during the cold season in the northern zone of the Mauritanian Exclusive Economic Zone (MEEZ) varies between 5.02ml/l and 6.01ml/l. The pH at sea varies between 7.5 and 8.4, with an average of around 8.2. Recorded pH values range from 7.56 to 8.04.

As for currents, the zone is characterised by the presence of the coastal upwelling system of the Canary Islands. In this coastal zone, strong sea winds push surface waters further out to sea, causing upwelled, cold, nutrient-rich waters to surface. Upwelling allows for high biological productivity in these areas, making it one of the world's major fish stocks.

Although the seabed show sound ecological health, no particular rare species seem to inhabit these waters. On the other hand, reports show that marine resources are threatened by overfishing, industrial disturbances and climate change. IMROP has observed a consistent drop in the yields of some twenty commercial species in the coastal zone.

**Biological Environment**

In the waters of Cap Blanc, phytoplankton is very abundant with a predominance of diatoms (IUCN / BRAO, 2008). The slope is the site of a very high phytoplankton and microalgae production. Fishermen have called it the "nursery". Some toxic species (notably the Dinophysis genus) have been found in phytoplankton. Consumed by fish or filtered by molluscs and moving up the food chain to humans, they can be the cause of human health afflictions. The density levels of the species identified is under current standards and therefore do not pose a risk to human health. Most aquatic vegetation includes seagrass beds and marine algae. From an ecological standpoint, seagrass beds are higher-value habitats because they are sensitive to environmental variations and water turbidity, and serve as primary nursery habitats. A bank of commercially exploitable Venus clams (Venus verrucosa) at depths of between 3 and 10m on sandy bottoms was mapped in 1987 and are present in dumping area no. 2 as well as the fairway that will be dredged.

The Benthic fauna is rich and diversified. It consists mainly of polychaetes and molluscs with a majority of bivalves, and crustaceans. The density per square meter of the stations sampled shows high values (6,663 organisms/m2 compared to 1000 to 2000 individuals/m2 at the Banc d'Arguin and in the tropical zone).

Protected species: Loggerhead turtles (Caretta caretta) and Green turtles (Chelonia mydas) are listed as endangered by IUCN, Leatherbacks (Dermochelys coriacea) as vulnerable and Hawksbill turtles (Eretmochelys imbricata) are classified as critically endangered (CR). All four species are found on the Mauritanian coast. Several other species of marine mammals are present all year long in the area. The Mediterranean Monk seal (Monachus monachus) is one of the protected species found near the project dredging area. They are particularly threatened because their habitats are destroyed (notably by the urbanization of tropical coastal areas), they fall victim to epidemics and get entangled in fishing gear. The creation of zones classified as "marine protected areas" has already doubled their number since 1998. Today, about 180 individuals are present in the caves of Cap Blanc. The number of births also increased from 24 newborns in 1998 to 51 in 2009. The Atlantic Humpback dolphin (Sousa teuszii), in addition to the monk seal, is a large predator at the apex of the trophic chain generally found near the coast. They achieved notoriety by "collaborating" with the Mauritanian fishermen by pushing schools of mullet towards the nets, up to the shore.

**Human Environment**

Nouadhibou is the largest town in Dakhlet Wilaya (Governorate) and comprises an urban municipality, namely Nouadhibou, and four rural municipalities - Bou Lanouar, Inal, Chami, Tmeimchatt and Nouamghar. These rural municipalities, which have a total of 96 localities, are very remote from the project area, but some localities attached to them are located on the coast and are included in the human environment study area: Chami and Agadir (attached to Nouamghar). The rural municipality of Nouadhibou is in the extreme Northwest of Mauritania, at the end of the Cap
Blanc peninsula. It is the second largest city in terms of population (119,752 inhabitants in 2013, comprising 41.1% of women and 58.9% of men), after the capital, Nouakchott.

According to the Operational Planning Scheme, Nouadhibou City is divided into 4 main sectors: (i) **the northern sector**, the most recent, poorly structured, mainly devoted to housing, with virtually no businesses/shops. Some neighbourhoods grew following the resettlement of displaced populations after the destruction of precarious housing (such housing still exists in places). The sector is also subject to significant urban sprawl, with many parcels left unbuilt. This sector has a high potential for urbanization, through densification, or extension to the North. Part of its coastal fringe (Baie de l'Etoile) would be conducive to the development of relatively upscale seaside tourism; (ii) the downtown area, although still relatively recent, is densely structured around its paved roads, and primarily the National Road, which is the backbone of Nouadhibou, through which it runs. Housing is very predominant but often concurrent with a shop or business, especially along routes with the heaviest traffic. The area is well equipped with public facilities, and has become the social and economic heart of the city and logically the area with the highest population density; (iii) **the southern sector** is the **historic heart and administrative centre of Nouadhibou**. Both housing and industrial activities related mainly to fishing and other commercial port activities (excluding mineral activities) are found in the area; (iv) **Pointe de Cansado** contains a **built-up housing area** and at the southern-most point of the peninsula, the ore port and oil terminal, which provide jobs and wealth, both directly and directly, behind fishing-related activities of the South sector.

Current housing consists almost exclusively of individual dwellings. The few apartment buildings mainly comprise tourist rentals. Based on an average household size of 5.4 people and an existing population of 119,752, the housing stock can be estimated at 18,500 housing units.

Thanks to the development of the mineral sector and especially fisheries-related activities, the Operational Master Plan of the Nouadhibou Free Zone estimates the population at 400,000 by 2028, including a high number of young Mauritanian and foreign job seekers. The share of the potentially active population (population aged 15-64) represents 55.7%.

**Energy**: The main electricity producer in Mauritania is SOMELEC, generated primarily from a thermal plant (fuel oil and diesel). SOMELEC operates a 38.5 MW plant likely to cover local needs until 2020. This energy is used to supply Nouadhibou City (excluding SNIM and Cansado), which had 14,393 subscribers in 2013. At the same time, SNIM owns and operates its own power stations in Nouadhibou: a 4.5 MW wind power plant, and a 7 MW power plant associated with the refinery.

**Water supply**: The only drinking water resource in Nouadhibou City is currently the Bou Lanouar aquifer catchment area, located 90 km from Nouadhibou. It is located in the aquifer of the western basin, in more or less clayey sands and sandstones. It includes 19 boreholes, 16 of which are operational, for a daily production of 12,000 m3/d (SNDE data), and 3 pumps with a unit capacity of 450 m3/h, one of which is backup.

**Sanitation**: The inhabitants of Nouadhibou, except those of Cansado, do not have any sewage system for the evacuation of sewage. Sewage is poured into the street or into septic tanks in areas far from the sea. In districts close to the sea (Dragage and Tcharka), sewage is discharged into the sea. Homes are equipped with pit latrines, dug down to the level of the salt water table. This system prevents odours and allows the owner to use them for a very long time without having to resort to drainage.

**Health**: Nouadhibou City’s health infrastructure consists of a regional hospital, a health centre and 12 dispensaries. Overall, there is a positive trend in indicators, construction and equipment of health structures in the city. The following constraints were identified during the study: personnel shortage - all categories combined; six out of the 12 health centres currently functioning are no longer able to adequately ensure health coverage for the continually growing population (high growth); poor logistics; staff absenteeism; lack of work equipment and materials; insufficient means to meet the needs of the city.
Education: The 70 schools in the city employ 575 teachers, count 483 classrooms with 19,399 pupils (2013-2014). Gender parity has been exceeded at the primary school level with 50.90% of girls. At the secondary level, parity is almost within reach at 46.43%. The city has 26 establishments that dispense a secondary school education, with 8895 pupils, 359 teachers and 259 classrooms. Schooling in Nouadhibou City shows an enrolment level above the national level, whether it is boys or girls, gross or net rates. The city also has technical and vocational training institutions, the main ones being: the Mauritanian Institute of Oceanographic Research (IMROP); the naval academy; the Technical Education Centre (Centre d'Enseignement Technique de Nouadhibou – formerly called Centre Mamadou Touré which has been renovated, reorganized and equipped with high-quality educational facilities) and the maritime academy.

Economic activities: The economic infrastructure includes 4 ports; 85 processing plants for fishery products; the airport; 3778 shops; 449 workshops/garages; 18 service stations; 1 slaughterhouse; 336 restaurants; 4 hotels; 15 hostels; and a livestock market. Apart from the mining and port activities (basic port activities, fishing, fish conservation and processing, ship repair, etc.), other sectors have a nominal impact on the local economy, as a number of medium-sized companies (e.g. construction) operating in Nouadhibou are based in Nouakchott.

Fishing is the main activity throughout the area, followed by trade and the civil service, respectively: 25.92%, 18.51% and 12.96%. The activities carried out in the area are very varied.

Tourism is still only budding, due to lack of infrastructure (high-end hotels in particular). Nevertheless, Nouadhibou City possesses significant, recognized tourist potential which could generate considerable revenue.

Trade is a core activity in Nouadhibou. However, no study on the city’s commercial framework has been conducted. Currently, the city counts 7 markets (a large central market in the city centre and six neighbourhood markets in the northern zone) and numerous shops, mainly around major shopping areas and main thoroughfares. In addition to these major markets, Nouadhibou also houses a livestock market located at the entrance to the city, a slaughterhouse and an exhibition and handicrafts centre.

Rainfed agriculture (rainfall-dependent farming), particularly developed in sub-Saharan Africa, does not exist in Nouadhibou where the prevailing agricultural system is market gardening, with a total cultivated area 55 ha (2011). The development of market gardening in Nouadhibou is linked to the growth of the city and its demographic changes. Nouadhibou City has a large number of farmers - 450 out of nearly 600 in the entire Wilaya. The 450 farmers belong to 75 cooperatives headed by the Union des Coopératives des Maraichers (a farming cooperative).

Livestock is poorly developed and comprises small ruminants and camels, and a negligible number of cattle. There are about 100 head of camels, 1200 head of sheep/goats and 50 head of cattle in the region. Goat farming is mainly domestic, hence the concentration of it in the city. Camel breeding, however, is more extensive outside the city.

Transport Infrastructure: The peninsula is connected to the rest of the country by the RN2, which runs for 480 km from Nouakchott to Nouadhibou. It crosses the peninsula passing through the port area and ends at the mining and oil port. The SNIM railway line, carrying the ore extracted from the Zouerat mines to the Nouadhibou ore port, should come into operation soon. It will also transport passengers and drinking water in tank wagons to communities located along the 600 km of the line. The city also has an international airport, with direct regular connections to Nouakchott, Zouérate, Casablanca and Gran Canaria. It has four ports located in the southern and central parts: (i) the mineral port, (ii) the oil jetty, (iii) the artisanal fishing port, and (iv) the autonomous port.

The Nouadhibou Autonomous Port (PAN) is essentially a fishing port. It is particularly well equipped for the conservation of fish and seafood. It has a 700 m dock with three tunnels for ice delivery. Five factories deliver 10 tons of ice per day. Repair shops and fairing services with floating docks of 300 tons and 1000 tons provide a complete range of service to its users.
The priority of the Fisheries Strategy 2008-2012 and the main thrust of the PRSP III plan for the fisheries sector in recent years has been to promote the development of landing infrastructure to better control fishing quotas for enhanced management, and as a prerequisite for greater integration of the sector into the national economy. They are taken into account in the cumulative impact assessment in the same area.

4.3 IDENTIFIED SENSITIVITIES

The main sensitivities that emerged from this study are as follows:

a) The importance of fisheries, on which the local and national economy is significantly based, and in particular the vulnerability of small-scale fishermen to industrial fishing.

b) The vulnerability of the biological environment, specifically protected species near the dredging and dumping areas and disposal area No. 2, as well as the proximity of the Banc d’Arguin, which is protected.

c) Strong currents and swell in the area, which causes high turbidity in the area and can also facilitate the dispersion of sediments.

d) The proximity of the border with Western Sahara and the presence of the Dakhla National Park.

e) Potential disruption of activities in the vicinity of the project area, namely:
   - Oil and gas activities;
   - The development of a deep-water port;
   - Maritime traffic on the area.

5 PROJECT ALTERNATIVES

5.1 THE “NO PROJECT” SCENARIO

Failure to carry out the project would constitute a hindrance to SNIM’s development and its objectives to meet the needs of its ore production and exportable products.

This dredging of the access fairway to the ore port is part of the infrastructure lending access to the oil terminal and to the container terminal of the Nouadhibou Autonomous Port, and ultimately to the economy of Mauritania’s capital city. It will provide access to large vessels with 240,000 T capacity.

This would make transport costs more affordable and consequently, among other things, promote sustainable economic development.

5.2 PROJECT ALTERNATIVES

Marine navigation is fully regulated, and the access fairway has been registered and certified with international maritime authorities.

Only one choice has been made for the route of the fairway - the current route. Depths and widths per area were determined according to the standard vessel sizes.

The choice between dredging/dumping at sea and dredging/dumping on land was closely examined with various machinery options, assessment of deposit sites and the environmental consequences of those solutions.

The choice with lower environmental and social impact, shorter deadlines and lower cost was made.

5.3 DESCRIPTION OF THE DREDGING PROJECT SELECTED

The proposed project consists of widening and deepening the current access fairway to the Nouadhibou Ore Port. 25-km long, the port comprises several sections: (i) a turning circle enabling
vessels to manoeuvre and turn after loading, depth -17.5 m; (ii) an interior fairway in a sheltered site, depth -17.5 to -18.0 m; (iii) the passage from Cap Blanc between Cap Blanc and the Banc du Lévrier (exposed to strong tidal currents), depth -18.0 to -20 m; (iv) a "Zone 1" exterior fairway poorly protected by sand banks south of Cap Blanc, depth -18 to -20 m; (v) a "Zone 2" exterior fairway channel that is highly exposed to offshore waves, depth -20 to -22 m.

It will require material and human resources for a period of approximately eighteen months, to perform work which, by definition, will modify the existing conditions of the site.

Figure 1: zoning of dredging sections

Following the dredging work, these sections will have the following characteristics:

<table>
<thead>
<tr>
<th>Sections to be dredged</th>
<th>Length (approx.)</th>
<th>Width</th>
<th>Depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turning basin</td>
<td>1.6 km</td>
<td>Ø 800m</td>
<td>-20.3m</td>
</tr>
<tr>
<td>Interior fairway</td>
<td>4.2 km</td>
<td>288 m</td>
<td>-20.3m</td>
</tr>
<tr>
<td>Curve track No.3</td>
<td>1.9 km</td>
<td>582 m</td>
<td>-22.2 m</td>
</tr>
<tr>
<td>Exterior fairway Zone 1</td>
<td>2.8 km</td>
<td>410 m</td>
<td>-22.2 m</td>
</tr>
<tr>
<td>Curve track No. 2 - Zone 2</td>
<td>2.1 km</td>
<td>430 m</td>
<td>-23.3 m</td>
</tr>
<tr>
<td>Exterior fairway Zone 2</td>
<td>6.5 km</td>
<td>400 m</td>
<td>-23.3 m</td>
</tr>
<tr>
<td>Curve track No. 1 - Zone 2</td>
<td>1.8 km</td>
<td>430 m</td>
<td>-23.3 m</td>
</tr>
<tr>
<td>Fairway exit</td>
<td>4.5 km</td>
<td>400 m</td>
<td>-23.3 m</td>
</tr>
</tbody>
</table>

**CONSTRUCTION PHASE**

An expansion of the existing fairway is planned to allow larger vessels to access the new ore port, completed in 2012. The work includes:

- Transportation of all equipment and all necessary facilities for the construction work;
- Related activities: site preparation and site facilities;
- Bathymetric LIDAR surveys before and after construction;
- Dredging of materials on the fairway line;
- Dredging of materials at two disposal sites near the fairway; and
- The packing up of all the equipment and facilities used for the construction.

The volume of sediment to be dredged is **22 million m³** in total, including 33% of the interior fairway, 26% of the exterior fairway Zone 1 and 41% of the exterior fairway Zone 2.

**OPERATION PHASE**

Once the dredging is complete, activities in the fairway will include: (i) grounding of ore carriers until the fairway is opened, (ii) movement of ore carriers in the fairway, (iii) loading, (iv) fairway maintenance.

Figure 2: Location of the project area
### 6 ENVIRONMENTAL AND SOCIAL IMPACTS

The project will generate both positive and negative environmental and social impacts. The project impacts focus on the **construction phase** of the dredging operation and the **operation phase**, which involves vessels carrying the ore using the fairway.

They were identified by weighing project activities against the environmental and social components. Potential impacts were then assessed via a dispersion model and the analysis of effects on the basis of environmental sensitivity. Overall, no **major irreversible** environmental impact was identified for this project. No populations are affected by the project.

Regarding the impacts on fishermen, it is important to note that fishing is prohibited in the fairway area of the ore port. The limit of the prohibition ends at the level of Buoy 0 and is the subject of recent navigation regulations in Mauritania, dating back over a year. Buoys have been set up to bar the access of fishermen and measures are taken to penalize those who break the law. As a result, it cannot be said that fishermen are directly affected by this project since this prohibition provision existed before the project was implemented. However, close consultation with fishermen and their federations is strongly recommended to identify and implement suitable solutions to ensure that all parties are satisfied.

#### 6.1 POSITIVE IMPACTS

The objective of the Fairway Dredging Project is to increase the size in depth and width of the fairway. This project will have positive impacts on the human (economic) environment in particular, including (i) improving port infrastructure and thus secure the use of the infrastructure. The project will allow the exploitation of the new ore wharf and the development of other port infrastructure. Therefore, it will participate indirectly in the development of local infrastructure; (ii) reduce maritime traffic related to ore transport ships and thus decrease interactions with other users of the zone. Beginning in 2020, it is estimated that traffic will be reduced by nearly 20%, which is significant; (iii) create jobs for local populations: dredging and port operations upon completion of the works will be a source of employment, especially for labourers, i.e. some 60 local hires for the duration of the work or an estimated 18 months. The development of port activities will mean that SNIM will need to increase its workforce. The increase is estimated at 230 jobs, i.e. 12% of the current workforce by 2021; (iv) increase SNIM’s export capacity and therefore boost revenue for the country’s largest company. The 50% increase in sales will significantly impact SNIM's bottom line. With its facilities and the development of ore production in Zouérate, SNIM aims to become one of the world's five largest exporters of iron ore. Improvement of port infrastructure is necessary to achieve this result.

#### 6.2 NEGATIVE IMPACTS

The non-negligible impacts are:

- Degradation of water quality due to an **accidental fuel spill**; The likelihood of this impact is low but its significance is potentially **moderate**;
- Disruption of fishing activities in the dredging area due to the **physical presence of the dredging machines** considered to be of minor importance as these activities are not officially authorized but are still practised by artisanal fisheries and have been the subject of concern for the population;
- Encounters with megafauna and potentially protected species, linked to the **physical presence of dredging machines**, estimated to be **minor** because of low probability;
- Pollution of the underwater sound environment due to the **noise produced by vessels and dredging activities**, deemed **moderate**;
- Disturbance of pelagic fauna, megafauna and protected species due to **underwater noise pollution**, and indirect impact on fisheries.

These impacts are considered **minor**;
Also, the degradation of the ambient sound environment has been deemed **moderate** in the vicinity of the **dredging vessels**, and noise pollution which could affect the **health** of the crew, has been assessed as **minor**;

Minor modification of the bathymetry and increased sedimentation in the fairway due to **sediment removal**, which will also involve the temporary destruction of the benthic fauna on the fairway route, considered to be **minor** given the resilience of benthic communities;

The sediment dumping will lead to increased turbidity in the water column within a radius of 50 to 60 km, representing a **moderate** impact and may also cause disruption or even the death (**minor** impact), and the disturbance of benthic fauna (**moderate** impact);

The **sediment deposits** on the seabed will result in the destruction of benthos at the dumping areas, which is considered to be a **moderate** impact, because of the high volume, but with a limited duration as the benthic community regenerates; lastly

The impacts of **waste and wastewater discharges**, as well as light pollution are considered negligible.

Figure 3: Concentration of suspended solids 12 h

Figure 4: Concentration of suspended solids 15 days after dredging begins - Balance

### 6.2.1 Negative Impacts during Fairway Operation

During the operation of the fairway, which includes operations at the loading dock and the movement of vessels in the fairway, the non-negligible impacts will be:

- The degradation of air quality by the **exhaust emissions from ships**, considered **moderate**;
- Also the degradation of air quality due to **dust deposits** during the loading of the ore, assessed as **moderate**;
- **Noise pollution related to the operation of the new wharf** is considered **minor**;
- Unlike the dredging phase, an impact on water quality is has been included in the event of an uncontrolled discharge of sewage and ballast water from ore carriers.

### 7 MITIGATION MEASURES

The proposed measures are associated with the impacts identified during construction and those during the operation of the fairway. They are considered to be non-negligible before implementation
of the prevention or mitigation measures. The majority of these measures for the most part fall under the responsibility of the company in charge of the dredging works or measures within the framework of the SNIM’s EMS or government-led measures.

7.1 MEASURES ADOPTED

Measures identified at the construction and operation phases are presented in table xx:

<table>
<thead>
<tr>
<th>Sensitivity</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase of works</td>
<td></td>
</tr>
</tbody>
</table>
| Management of hydrocarbons | • No spillage at sea  
|                     | • Regular maintenance of equipment                                      |
|                     | • Secure storage of products                                             |
|                     | • Preparation of an anti-pollution plan and a plan to manage accidental spillages |
| Physical presence of vessels | • Number of vessels reduced to a minimum: 2 dredgers (including one self-propelling vessel, no barges) |
|                     | • Definition of a traffic plan - validated with the harbour master and Free Zone Authority and communication protocols |
|                     | • Provisions for the safety and security of all users                  |
|                     | • Establishment of a complaints registry                                |
| Noise pollution     | • Selection of low-noise equipment, installation of mufflers on impact tools and sound screens to absorb noise from engine rooms, compressors, generators and pumps |
|                     | • Maintenance of dredging vessels, engines, hydraulic winches etc. to avoid squeaking noises |
| Sediment removal   | • Limiting the speed of the self-propelled suction cutter dredger       |
|                     | • No water injection dredging into rock or sediment (Jetsed)            |
|                     | • A passage corridor through which the pirogues can cut through the fairway safely, without the need to circumvent |
| Dumping            | • The dredging company must implement measures limiting the disposal of sediment in the water column (e.g. Green Valve, dredging without overflow, environmental dredging, etc.). |
|                     | • Establish a dialogue with the Free Zone Authority to discuss sediment reuse for the deep-water port (depending on project progress and quantity of sediment) |
|                     | • Limit dredging during the high season for fishing and promote moratoria (periods to be confirmed) |
| In the operation phase |                                                                         |
| Physical presence of vessels | • Respect of the traffic management plan                  |
|                     | • Observation of underwater fauna                                       |
|                     | • Stopping engines in the event of megafauna sightings                  |
| Management of hydrocarbons | • Shutdown of ore carrier engines during loading (SNIM manages electricity requirements) |
| Unloading the ore   | • Installation of a tube with pouring spout on the loading arm           |
|                     | • Installation of a water spray system coupled with the loading arm      |
|                     | • Protective equipment provided to wharf operators                      |
| Wastewater and ballast water | • No spill within 4 to 12 nautical miles (impact is intrinsically negative but relatively positive) |
|                     | • On board, vessels must carry and implement a ballast water management plan |
|                     | • Vessels must have a Ballast Water Register                           |
| Maintenance dredging | • Systematic fairway maintenance to reduce dredging quantities each time |
|                     | • Complete analysis of sediment prior to dredging                       |
|                     | • Implementation of a plan to monitor bathymetry, turbidity and the concentration of suspended solids |

7.2 SPECIFIC MEASURES

During the works, specific management plans will be developed by the dredging company.

(i) A risk management program, which will include at least the following plans: (i) Waste Management Plan; (ii) Pollution Prevention Plan; (iii) Risk Analysis; (iv) Emergency Management Plan with sufficient number of life-saving appliances and readily available in case of emergency, as well as a maintenance programme and firefighting equipment.

(ii) In agreement with the Harbour Master's Office, the Contractor shall draw up a traffic and beaconing plan to guide ships and other users. This plan will specify: (i) the location of the area of operation according to the different phases and the different points of intervention, clearly showing the distance from the existing structures and
traffic corridors; (ii) the lane or corridors which may be used by ships and other users or prohibited by installing markings as planned. This plan will be provided to the harbour master for validation.

(iii) Specific beaconing and GPS coordinates of the passage are provided to enable pirogues to cross the fairway. This provision is made for the safety and security of all users. However, the fairway is not supposed to be crossed by pirogue users nor used as a fishing zone as this would pose a great risk to fishermen and compromise ore carriers.

(iv) An adequate lighting plan for night activities in the area of operation. SNIM may request a measurement survey to monitor the proper lighting arrangements.

The minimum illumination levels are defined in the following ILO standards:

<table>
<thead>
<tr>
<th>Activity / task</th>
<th>Minimum illuminance (lux)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Movement of people, machines and vehicles (land)</td>
<td>5</td>
</tr>
<tr>
<td>Movement of people, machines and vehicles in hazardous areas (considered applicable for work at sea)</td>
<td>20</td>
</tr>
<tr>
<td>Work requiring limited perception of detail</td>
<td>50</td>
</tr>
<tr>
<td>Work requiring perception of detail</td>
<td>100</td>
</tr>
<tr>
<td>Work requiring perception of fine detail</td>
<td>200</td>
</tr>
</tbody>
</table>

7.3 **RESIDUAL IMPACTS**

The residual impacts after application of the recommended measures are of minor importance and are inherently reversible. They are summarised as follows:

- Regeneration of the benthos at the dumping the site, which would take almost two years after the end of the dredging operations.
- Risk frequency of collision with large marine fauna reduced by the limited presence of large vessels in the area.
- Less frequent maintenance dredging operations.
- The permanent establishment of extended HSE procedures.

7.4 **CUMULATIVE IMPACTS**

In this context, a certain number of infrastructure projects have been developed, namely the completion of the extension of the Nouadhibou Autonomous Port (PAN):

- Extension of 660-m long platforms equipped with water supply systems and docking and mooring facilities;
- An area of 121,000 m² of storage space in the container terminal;
- Two ramps (roll-on/roll-off (RoRo)), 41.50 m wide, capable of accommodating vessels over 100 m in length;
- Dredging at 800 m from the turning basin and at the foot of the wharves;
- Removal of wrecks in the wharf area.

8 **ENVIRONMENTAL RISK MANAGEMENT AND CLIMATE CHANGE**

8.1 **NATURAL AND ENVIRONMENTAL RISKS**

The companies and SNIM will need to implement and adjust their risk management plans to account for dredging and channel operations. Companies involved in the dredging and SNIM will have to meet minimum recommendations for Mauritanian law and those defined in the International Convention for the Safety of Life at Sea (SOLAS).
The following elements provide the points that should be integrated and adhered to in the Operational Plan.

(i) Occupational Health and Safety
- Overall organization of occupational health and safety issues
- Access to vessels
- Organization of collective security (risks of falls)
- Personal protective equipment (PPE), i.e. helmets, safety shoes or boots, high-visibility vests (or equivalent) must be worn permanently by any person present on the site: both permanent and temporary workers, supervisory staff or occasional visitors.

During specific work: gloves for handling heavy or sharp objects and chemicals, dust mask and toxic products; goggles for welding work; noise protection, flotation devices (life jackets), protective impermeable clothing.

(ii) Early warning system and prevention of risk of electrical shocks and protection of electrical connections, as well as protection against fire.

(iii) The risk of an emergency situation and falls, by the establishment of appropriate measures (at minimum):
- Man overboard
- Medical Evacuation
- Firefighting
- Abandonment of the ship
- Collision and material damage
- Accidental leak or spillage (hydrocarbons or other).

(iv) The handling conditions for various materials and equipment.

(v) Use of hazardous products: list of products used. The dredging company should keep the list of dangerous products up to date, as well as their purpose and place of use. This list will be accompanied by a register of the Safety Data Sheets (SDS). The SDS-defined requirements must be implemented. Exposed workers will be trained in their use and in responding to an accident.

8.2 CLIMATE CHANGE-RELATED RISKS

The rise of oceanic waters, which is likely to alter tidal and swell patterns, is the phenomenon prevailing in the project area and in the Baie des Lévriers.

Swell heights depend on the value of the depths and may result in significant erosion on the coasts immediately in the vicinity of the project fairway. The prevailing winds are likely to amplify it. The risk is related to the coast adjacent to the Atlantic coast of the Cap Blanc peninsula. The control of coastal erosion will be the subject of a more general examination in the Baie des Lévriers and falls under the purview of the Ministry of the Environment and Sustainable Development.

Concerning the project, the design took into account the preventive measures of adaptation to climate change. (i) the slopes of the channel are 5\(u\) in length and 1\(u\) in height, allowing the flow of tidal currents without constituting an obstacle, (ii) excluding fairway dredging, infrastructure has taken into account minimum safe distance of the loading arm of the ore carrier (1 m) taking into account the highest swells combined with the highest tides as well as the long-term rise in sea level.
The probability of this combination occurring is extremely low, (iii) by accommodating large ore carriers, the carbon emissions generated by maritime traffic per tonne transported are minimal in comparison to road traffic. The global trend is drastically reduced for new generation ships (0.5g EC/t) equipped with particle filters at the outlet nozzle.

9 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

9.1 INSTITUTIONAL ORGANIZATION

The ESMP defines the actors involved in the dredging project and their respective roles and responsibilities: (i) SNIM; (ii) the dredging company; (iii) fairway users; (iv) local authorities;

9.2 SURVEILLANCE PROGRAM

Monitoring refers to supervision activities and dredging controls to ensure that the ESIA and ESMP commitments and recommendations are effectively implemented. Surveillance should include the definition of non-conformities and a plan of action to remedy or even directly solve problems encountered. It requires the inclusion of provisions in the contract documents signed with the dredging company (and clients of the ore port), thus making environmental and social mitigation measures defined in impact assessment mandatory.

9.3 MONITORING PROGRAM

Monitoring objectives include the following additional concerns: (i) ensuring the project's environmental quality by verifying that the temporary/permanent, direct/indirect impacts of the project are in line with the impact assessment forecast, (ii) verifying the effectiveness of the implemented mitigation measures and recalibrating mitigation measures if they are insufficient/inadequate to counter incidents observed; (iii) retaining lessons learned for future dredging and disposal operations, including improvements in site operation or extraction and disposal.

The proposed monitoring includes:

<table>
<thead>
<tr>
<th>Construction phase</th>
<th>Operation Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Monitoring the volumes of materials extracted and reintroduced into the natural environment</td>
<td>- Measurement of air quality at the port</td>
</tr>
<tr>
<td>- Bathymetric LIDAR surveys: progress reports to monitor construction work and its effect on the seabed</td>
<td>- Bathymetric LIDAR surveys to assess the status of the dredged area and the stability of the sedimentary discharge area</td>
</tr>
<tr>
<td>- On-site monitoring of the physical quality of water at different depths (sub-surface, mid-distance, bottom)</td>
<td>- Assessment of sediment quality before maintenance dredging</td>
</tr>
<tr>
<td>- Monitoring mammalian movements</td>
<td>- Monitoring of accidents with animals and coastal deaths</td>
</tr>
<tr>
<td>- Monitoring animal-related accidents</td>
<td>- Long-term monitoring by integration: use of bio-integrators to assess the impact of long-term sediment immersion and target the risk of bio-contamination</td>
</tr>
<tr>
<td>- Monitoring fishery outputs (to be validated, under external oversight)</td>
<td>- Benthos monitoring: (study of the recolonization process)</td>
</tr>
<tr>
<td>- Monitoring noise levels</td>
<td>- Establishment of specific monitoring of monk seals, whales and dolphins</td>
</tr>
<tr>
<td>- Monitoring mammalian movements</td>
<td>- Maritime traffic monitoring</td>
</tr>
<tr>
<td>- Measurement of illuminance indices at night workstations</td>
<td>- Monitoring of fishing outputs</td>
</tr>
</tbody>
</table>

This monitoring will be carried out in addition to the environmental supervision, which will consist of ensuring that the mitigation measures are effectively implemented.

9.4 MANAGEMENT OF COMPLAINTS AND GRIEVANCES

SNIM will set up a grievance management system (register of grievances and complaints), managed by representatives of the local authorities, i.e. the Free Zone Authority. This will be monitored internally by the SNIM Environmental Management System Manager. To ensure external monitoring for the grievances, the Hakem (district representative) of Nouadhibou will be informed periodically of the nature of the grievances appearing in the register.
In the absence of an amicable settlement between the parties with grievances/complaints and the SNIM, these persons will be able to address the Hakem. He will attempt to resolve the grievance/complaint at the local level. The SNIM General Management representative will be involved throughout the process to assist with the resolution of complaints. In the absence of an agreement between the complainant and SNIM, a recourse procedure before a conciliation board will be established. In addition to the district representative, the commission may, depending on the nature of the grievance, include the following representatives of the Administration:

- The Free Zone Authority Director
- The Regional Delegate of the Ministry of Environment
- The Regional Delegate of the Ministry of Fisheries and Maritime Economy
- The Regional Delegate of the Ministry of Social Affairs, Childhood and Family
- The Regional Labour Inspector
- The Mayor of Nouadhibou.

9.5 IMPLEMENTATION SCHEDULE

Implementation is entirely based on the project implementation schedule. Implementation of the construction site ESMP, the HSE plan and the various management and measurement plans will be ongoing. The construction and manoeuvring areas will be marked.

The operations schedule is outlined below.

<table>
<thead>
<tr>
<th>Task Name</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site set-up</td>
<td>4 weeks</td>
</tr>
<tr>
<td>Construction survey</td>
<td>1 week</td>
</tr>
<tr>
<td>Establish the QAP and the Individual Health and Safety Protection Plan</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Transportation of all equipment and all necessary facilities for the construction work</td>
<td>3 weeks</td>
</tr>
<tr>
<td>Bathymetric LIDAR survey prior to dredging</td>
<td>1 week</td>
</tr>
<tr>
<td>Dredging of the interior fairway</td>
<td>1 month</td>
</tr>
<tr>
<td>Trailing suction hopper dredger</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Self-propelled suction cutter dredger</td>
<td>1 week</td>
</tr>
<tr>
<td>Dredging of the exterior fairway - Zone 1</td>
<td>1 month</td>
</tr>
<tr>
<td>Trailing suction hopper dredger</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Dredging of the exterior fairway - Zone 2</td>
<td>1 month</td>
</tr>
<tr>
<td>Trailing suction hopper dredger</td>
<td>2 weeks</td>
</tr>
<tr>
<td>Post-dredging works</td>
<td>3 days</td>
</tr>
<tr>
<td>Bathymetric LIDAR survey after dredging</td>
<td>1 day</td>
</tr>
<tr>
<td>As-built drawings</td>
<td>2 days</td>
</tr>
<tr>
<td>Pack-up of all equipment and all facilities necessary for the construction work</td>
<td>1 week</td>
</tr>
</tbody>
</table>

9.6 BUDGET FOR SURVEILLANCE AND MONITORING PROGRAM

The overall budget for the environmental and social management plan for the channel dredging project is estimated at close to **EUR 273,000** (excluding taxes). It represents almost **0.25%** of the total budget of the project (EUR 110.65 million),
<table>
<thead>
<tr>
<th>Phase of monitoring</th>
<th>Frequency</th>
<th>Locations</th>
<th>Costs in Euro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring the volumes of materials extracted and reintroduced into the natural environment</td>
<td>Ongoing</td>
<td>Dredging areas</td>
<td>Integrated as part of Dredging Company services</td>
</tr>
<tr>
<td>Bathymetric LIDAR surveys: progress surveys must be carried out to monitor the progress of the construction and changes in the seabed: verification of the depth objectives in the dredging area and verification of the size of the deposit zone to see if it is consistent with the area originally defined</td>
<td>Pre-construction</td>
<td>Dredging areas</td>
<td>Integrated as part of Dredging Company services</td>
</tr>
<tr>
<td></td>
<td>During construction</td>
<td>Fairway</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-construction</td>
<td>Immersion areas (and beyond a distance of 500 m, to be adjusted depending on the deposits actually recorded)</td>
<td></td>
</tr>
<tr>
<td>On-site monitoring of the physical quality of water at different depths (sub-surface, mid-distance, bottom):</td>
<td>Ongoing</td>
<td>Off Cap Blanc, northward</td>
<td>25,000</td>
</tr>
<tr>
<td></td>
<td>Bathymetric</td>
<td>Ongoing</td>
<td>120,000</td>
</tr>
<tr>
<td></td>
<td>LIDAR surveys: progress surveys must be carried out to monitor the progress of the construction and changes in the seabed: verification of the depth objectives in the dredging area and verification of the size of the deposit zone to see if it is consistent with the area originally defined</td>
<td>Pre-construction</td>
<td>Dredging areas</td>
</tr>
<tr>
<td></td>
<td>During construction</td>
<td>Fairway</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-construction</td>
<td>Immersion areas (and beyond a distance of 500 m, to be adjusted depending on the deposits actually recorded)</td>
<td></td>
</tr>
<tr>
<td>On-site monitoring of the physical quality of water at different depths (sub-surface, mid-distance, bottom):</td>
<td>Ongoing</td>
<td>Fairway</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bathymetric</td>
<td>Ongoing</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LIDAR surveys: progress surveys must be carried out to monitor the progress of the construction and changes in the seabed: verification of the depth objectives in the dredging area and verification of the size of the deposit zone to see if it is consistent with the area originally defined</td>
<td>Pre-construction</td>
<td>Dredging areas</td>
</tr>
<tr>
<td></td>
<td>During construction</td>
<td>Fairway</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Post-construction</td>
<td>Immersion areas (and beyond a distance of 500 m, to be adjusted depending on the deposits actually recorded)</td>
<td></td>
</tr>
<tr>
<td>Monitoring of beacons marking suspended solids at Cap Blanc</td>
<td>Ongoing</td>
<td>Off Cap Blanc, northward</td>
<td>50,000</td>
</tr>
<tr>
<td>Maritime traffic monitoring</td>
<td>Fairway and port</td>
<td>No cost</td>
<td></td>
</tr>
<tr>
<td>Monitoring mammalian movements</td>
<td>Surveys</td>
<td>Extraction and immersion areas</td>
<td>50,000</td>
</tr>
<tr>
<td>Monitoring fishery outputs (to be validated, under external oversight)</td>
<td>Surveys</td>
<td>Fairway and discharge areas</td>
<td>18,000</td>
</tr>
<tr>
<td>Monitoring noise levels</td>
<td>Fairway and discharge areas</td>
<td>Annual survey</td>
<td>4,000</td>
</tr>
<tr>
<td>Measurement of illuminance indices at night workstations</td>
<td>Workstations and living quarters</td>
<td>Pre-project</td>
<td>2,000</td>
</tr>
<tr>
<td>In the operation phase</td>
<td>Fairway - dredging area</td>
<td>Annual survey</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Areas around immersion areas</td>
<td>Survey every five years</td>
<td>Costs to be defined with IMROP (Mauritanian Oceanographic and Fisheries Research Institute)</td>
</tr>
<tr>
<td></td>
<td>Coastal mortalities</td>
<td>Annual survey</td>
<td>Costs to be defined with IMROP (Mauritanian Oceanographic and Fisheries Research Institute)</td>
</tr>
<tr>
<td></td>
<td>Marine mammals</td>
<td>Annual survey</td>
<td>Costs to be defined with IMROP (Mauritanian Oceanographic and Fisheries Research Institute)</td>
</tr>
<tr>
<td></td>
<td>Coastal mortalities</td>
<td>Annual survey</td>
<td>Costs to be defined with IMROP (Mauritanian Oceanographic and Fisheries Research Institute)</td>
</tr>
<tr>
<td>Maritime traffic monitoring</td>
<td>Fairway and port</td>
<td>No cost</td>
<td></td>
</tr>
<tr>
<td>Monitoring of fishing outputs</td>
<td>Fairway and port</td>
<td>No cost</td>
<td></td>
</tr>
</tbody>
</table>

**Total construction work** 245,000

**Total works and two years of operation** 273,000
9.7 REPORTS SUBMITTED TO THE MINISTRY OF ENVIRONMENT

Decree 2007-105 requires that the promoter (SNIM) send semi-annual reports to the supervising ministry to demonstrate the implementation of the environmental and social management plan. On the basis of the ESMP, it should include: (i) the registry; (ii) a summary of the activities carried out during the past period (based on the reports of on-site visits and meetings); (iii) data from environmental monitoring operations performed during the period; (iv) action plan identifying non-conformities and implementation of resolution measures; (v) the incident log; and (vi) the complaints register.

10 CONSULTATION AND PUBLIC INFORMATION

During the preparation of the ESIA, the inclusive approach was adopted. This entailed a series of public consultations attended by representatives of the main institutions involved in the project. As a result of the public meetings, individual interviews and focus groups were carried out by the social survey teams in June 2016. The interviewees, who constituted almost 70% of the total number of fishermen, expressed their fears about environmental impacts. The interviews not only collected opinions but also provided additional information on socio-economic data. The civil society representatives interviewed voiced their approval of the positive benefits of the dredging project in terms of the development of port facilities in the free zone, increasing SNIM's export capacity and reducing unemployment by creating new jobs.

The opinions and perceptions gathered point to the following:

- Fears that dredging operations will have negative impacts on the population and fisheries, including artisanal fishing, which constitutes the livelihood of the majority of the population
- Disruption of vessel traffic and the risk of collision
- Increase in fuel costs to reach fishing grounds
- Contamination of fish by foreign species that can be transported by vessels docking at port
- Disruption of sport fishing
- Increase in the poverty rate (traditional fishermen)
- Probability of migration of fish from the usual artisanal fishing zones due to the noise pollution produced by the dredging company during dredging
- Reduction of the contribution of the fisheries sector to the state budget and support to food security (malnutrition of women and children in the project area)
- Pollution of fauna and flora, problems caused by project activities on maritime traffic
- Probability of foreign vessels introducing other harmful species
- Pollution of protected areas (fauna and flora), etc.

Expectations and grievances:

- Clear request to pay attention to the protected areas, in particular the PNBA (Banc d'Arguin National Park) so that the fauna and flora species of this area are not impacted
- Accompanying measures expected, ranging from awareness raising to the compensation of possible risks caused by the project and coordination between the project and the maritime traffic operators with a view to avoiding accidents and easing navigation for artisanal fishermen. Specifically, it was requested that maps and beaconing of the fairway entry area be established to secure maritime traffic
• Need to coordinate with the deep-water port project that may require the use of dredged sediments
• Need to comply with the new free zone regulations, in particular with regard to traffic and the environment.

In particular, the following suggestions were made: (i) stop or limit the project; (ii) adapt the project to environmental decrees and regulations; (iii) assist fishermen financially; (iv) raise awareness among fishermen.

The specific consultation with the Nouadhibou Fishing Federation

On 20 July 2017, SNIM presented the subject, scope and results of the Environmental and Social Impact Assessment of the dredging project for the access fairway to the ore port. It provided details of the progress and conclusions of the Environmental and Social Impact Assessment of the dredging project.

The concerns that emerged from this consultation are: (i) concerns such as the risk of the water body being overrun by dredging equipment throughout the duration of the project, the preservation of the marine environment and the disruption of the ecosystem during the construction phase, (ii) expectations focused on the positive impact on SNIM’s export capacity that will benefit the country, the installation of beacons to cordon off the work area, the information to the Federation on the start and end of construction, SNIM’s contribution in the form of infrastructure or other.

SNIM explained that even if the work period exceeds one year, the entire body of water will not be occupied. The dredging of the fairway will be accomplished in phases and over three areas. The work phases have been designed such that each time an area is occupied, the other two remain free. SNIM reminded the Federation of its willingness to cooperate with all stakeholders involved in the project and in particular with the National Fishing Federation, and that it plans to dedicate hotlines to the project which will be communicated to all to encourage communication. The project head is already in contact with stakeholders and is available to respond to their needs and questions.

At the end of the presentation session, the Federation expressed its satisfaction with the information received and was able to express its concerns to SNIM, which are: (i) to be informed at the start of the work, (ii) to be assisted in raising the awareness of fishermen on the project, (iii) SNIM must beacon the fairway and provide the GPS coordinates of its periphery, (iv) SNIM must compensate the fishing community for losses arising from the need to circumvent the work area during the implementation phase (in the form of a donation of fishing gear, infrastructure, etc.)

Communication during the implementation phase of the project. The following are expected: (i) a special consultation with the fishermen in the area in consultation with the federations on site, (ii) a system of information, awareness raising and education for the local population in collaboration with local authorities.

Public disclosure

The mandatory public enquiry was opened on 14 July 2017 and for one month, in accordance with the Mauritanian public disclosure regulations, with the support of the notices published in two national dailies, and a register open both at the Moughata (district) level and at the Nouadhibou City Hall. The ESIA is also available on the SNIM website: http://www.ndbfreezone.mr/index.php/media-room/communiqu%C3%A9%20avis-d%E2%80%99ouverture-d%E2%80%99enqu%C3%A9e-publique-etude-d%E2%80%99impact-environnemental-et-social-du-projet-de-dragage-du-chenal-du-port-%E2%80%93snim-%E2%80%93nouadhibou.html

No major observations were recorded. As a result, the validation was pronounced and the project holds a favourable environmental opinion, pronounced on 14 August 2017.

The AfDB will disseminate this summary on its website at least 60 days prior to the Board of Directors’ meeting.
11 ADDITIONAL INITIATIVES

Support for fishermen

In terms of social improvement measures, SNIM will very likely provide support for fishermen through: (i) the protection of the coastal area that is considered a nursery, (ii) reinforcement of beaconing, so that they are visible to pirogue users, (iii) management of turbidity risks beyond Buoy 0 towards the high seas.

CSR Actions

As part of this specific project, SNIM will:

(i) In terms of employment, promote the employability of young graduates by including them in a training course within the project team, the supervisory office and the company charged with the work. In this regard, SNIM must determine the number and profile of trainees. (ii) In the area of sustainable development, ensure protection at sea and on land in the project area.

To this end, a program must be drawn up by SNIM in close consultation with the relevant state and local authorities.

12 CONCLUSION

The main issues arising from the environmental assessment and analysis have been addressed, and identified impacts are associated with appropriate measures to offset or mitigate them.

The impacts are essentially in the maritime public domain of the Mauritanian state. From the compensation and resettlement standpoints, the inquiry has concluded that no persons shall be affected by the project insofar as the occupied area is strictly forbidden to fishermen and forms part of SNIM’s land, and all the provisions have already been made to ensure this (boarding of boats/pirogues, penalties, marking of the restricted area, etc.). Taking into account the identified impacts and measures, this project is considered environmentally and socially acceptable. The project received a favourable opinion of environmental feasibility from the Environment Department of the Nouadhibou Free Zone Authority.

13 REFERENCES AND CONTACTS

13.1 References

The main references to the study documents (in French) are:

- EIES Dragage chenal SNIM_Volume 2_Projet et Réglementation (ESIA Fairway Dredging SNIM_Volume 2_Project and Regulation)
- EIES Dragage chenal SNIM_Volume 3_Etat Initial (ESIA Fairway Dredging SNIM_Volume 3_Initial status)
- EIES Dragage chenal SNIM_Volume 4_Impacts (ESIA Fairway Dredging SNIM_Volume 4_Impacts)
- EIES Dragage chenal SNIM_Volume 5_PGES (ESIA Fairway Dredging SNIM_Volume 4_Impacts)
- EIES Dragage chenal SNIM_Volume 6_ANNEXES compiles (ESIA Dredging channel SNIM_Volume 6_compiled ANNEXES)

13.2 Contacts

For any additional information, please contact:

(i) SNIM
- Yahya Ould Mohamed Beiba, Director of Research, Development and Modernisation. Email: y.m.beiba@snim.com
El Hilal Ould Baba, Head of Treasury and Finance Department. Email: elhilal.baba@snim.com
Diallo Mohamed Habib, Head of Civil Engineering Department - Project Leader. Email: Dmhabib@snim.com
Moulay Ismail Ould Sidaty, Head of the Environment Department. Email: i.sidaty@snim.com

AfDB
Ousmane FALL, Investments Officer, PISD1. Email: O.FALL@AFDB.org
Pierre Hassan SANON, Social Development Officer, RDGN4/SNSC. Email: H.SANON.AFDB.ORG
Salim BAIOD, Consultant Environmental Specialist, SNSC. Email: S.BAIOD@AFDB.ORG