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Social and Environmental Impact Assessment (SEIA) for GAC's Market Bauxite Samples Project, Guinea

Non-technical Summary

Guinea Alumina Corporation S.A. (GAC)

June 2016

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Guinea Alumina Corporation S.A. (GAC)

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Position: Partner

On behalf of ERM France SAS

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1 INTRODUCTION

This document is a Non-Technical Summary (NTS) of the social and environmental impact assessment (SEIA) study undertaken by Emirates Global Aluminium (EGA)/ Guinea Alumina Corporation (GAC) for the Market Bauxite Sample Project (MBS).

It provides an overview of the SEIA findings, focusing on the key social and environmental issues arising from the planned activities in the three study areas of the Project: the bauxite mine, the national road through which the ore will be transported, and the port of Kamsar. This summary also presents the approach that GAC proposes to adopt in order to manage these issues, and where possible enhance the Project's positive impacts.

The NTS is structured as follows:

- Section 2 is an introduction on GAC's commitment to health, safety and environment.
- Section 3 introduces GAC, the proponent of the Project. It also includes a summary of the Guinean regulatory framework and international standards that were considered in developing the SEIA.
- Section 4 describes the Project and key alternatives considered.
- Section 5 describes how the Project will translate in terms of employment.
- Section 6 provides a summary of the assessment of environmental and social impacts and benefits of the Project, and summarizes the measures that GAC proposes to implement to address them.
- Section 7 outlines end-of-mine-life closure and rehabilitation activities.
- Section 8 provides a summary of how GAC will implement environmental and social management measures, through a Project-specific Social and Environmental Management Plan (SEMP).

As stated in EGA/ GAC's Code of Business Conduct, "*A key Charter value is our overriding commitment to health and safety and our aspiration for Zero Harm to our people, the environment and the communities in which we operate*".

In application of this commitment, EGA has adopted a Health, Safety and Environment (HSE) policy that states:

"We at EGA are committed to Health, Safety and Environment of our stakeholders and society at large wherein we carry out our business, also committed to continuous improvement and sustainable development".

The GAC market bauxite samples project is being developed by EGA/ GAC in line with these HSEC commitments. This implies EGA and GAC's continuous attention to proactive and sound management of health, safety and environmental risks and impacts.

3.1 GAC

Guinea Alumina Corporation (GAC) is a Guinean registered company owned by Emirates Global Aluminium (EGA), a joint venture of Mubadala, an investment and development company established by the Government of Abu Dhabi, and the Investment Corporation of Dubai (ICD) established by the Government of Dubai. EGA acquired full ownership of GAC in June 2013.

Under previous ownership, in 2004, GAC signed a concession agreement with the Government of the Republic of Guinea to develop a bauxite mining and refining project in the sub-prefecture of Sangarédi, prefecture of Boké, in the north-west of Guinea. The agreement also includes a port concession in the coastal city of Kamsar, to allow for the shipping of product to the international market.

Firstly, GAC is currently developing a project for the export of high grade bauxite referred to as "GAC's bauxite export project". This project is expected to generate significant benefits for the country as described in detail in the 2015 SEIA Addendum report for the project. In short, GAC's bauxite export project will improve the positioning of Guinea on the bauxite world market and will generate an estimated incremental USD500 million per annum of GDP contribution and USD250-300 million to the Guinean trade balance. The project will also contribute to employment creation and to local and regional socioeconomic development.

The GAC project was subject to initial SEIA studies, carried out by GAC in 2004, 2005 and 2006, and subsequently submitted to and approved by the Guinean authorities. The results of these SEIA studies were compiled in an integrated SEIA in 2008. (*Knight Piésold, 2008).* The SEIA Addendum developed in 2015 specifically for the bauxite export project serves as an extension and update of the previous studies performed by GAC and has also been approved by the Guinean authorities in February 2016.

In order to promote financing of the bauxite export project and to demonstrate the value of marketing this bauxite, GAC proposes a pre-phase in which samples of bauxite would be extracted and brought to the international market. This would allow GAC's potential clients to commit to longer term contracts and thereby support the implementation of the main project.

This solution is referred to as the "GAC's Market Bauxite Samples initiative", or MBS project, which is the focus of this new study.

3.2 CONFIGURATION OF GAC'S BAUXITE EXPORT PROJECT

GAC's bauxite export project will include:

- greenfield bauxite mining activities in the southern part of the GAC concession with production capacity expected to start at 8 million tons per annum (Mtpa) of high grade bauxite (dry weight) around Q2 2018 before reaching potentially 17 Mtpa (dry weight) starting 2020, for a duration of at least 20 years;

- a bauxite ore crushing plant, stockyards and rail loading facility, to be located adjacent to the bauxite mine, within the concession area; and

- stockyards and loading and unloading facilities at the GAC port concession in Kamsar.

3.3 CONFIGURATION OF THE MBS PROJECT (OBJECT OF THIS SEIA AND OF THIS NON-TECHNICAL SUMMARY)

In the context of the MBS Project, GAC considers starting the exploitation and export of several bauxite samples of 250,000 to 300,000 tons per year over a period of 2 to 3 years as of July 2016.

The bauxite resources to be exploited will only be those located north of Plateau 20, which is a plateau of bauxite located west of the GAC concession in the sub-prefecture of Tanéné. The transport of the bauxite to the Kamsar Container Terminal (KCT) at the port will be done by road and not by train, until the upgrade to the railroad infrastructure planned in the context of the multiuser agreement between ANAIM, CBG, GAC, and RUSAL is implemented. Port operations and offshore loading will also be simplified to 6 yearly shipments of bauxite via Supramax ore carriers (50,000 tons).

The MBS Project will therefore include:

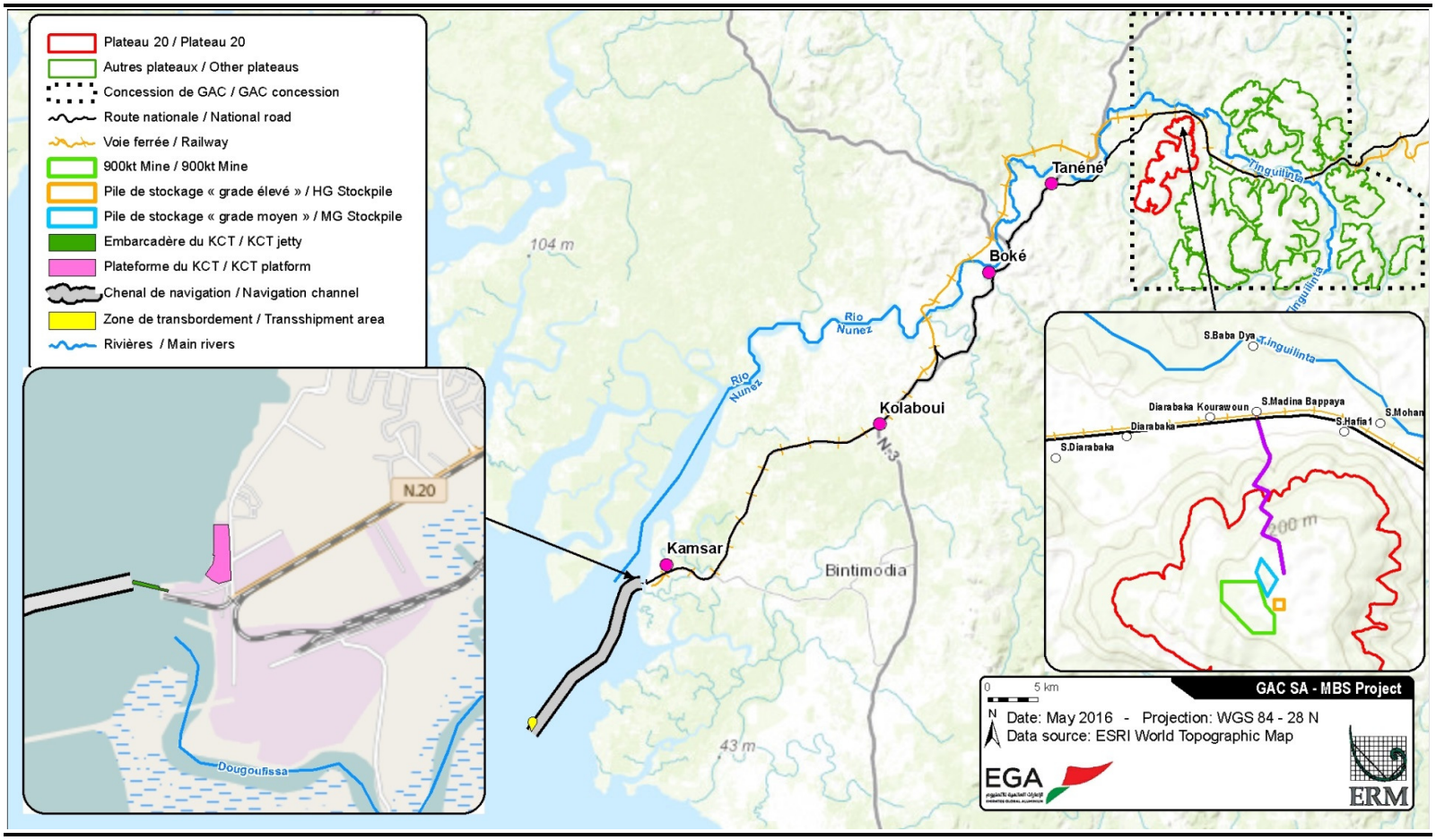
- the development and exploitation of a bauxite mine north of Plateau 20 of the GAC concession and set up of infrastructures necessary to the mining operations on Plateau 20 (haul roads, mobile ore crushing plant);

- the transport of the bauxite ore by road from Plateau 20 to the KCT at the port of Kamsar via trucks with 40 ton carrying capacity; and

- the configuration of the KCT at the port of Kamsar to allow for the stockpiling of the bauxite ore and its loading on barges. These barges will then transit to the loading point of the ore carriers located at the northern end of the navigation channel of the port.

The regional setting of the Project is shown in *Figure 3.1*.

Figure 3.1 Overview of GAC's MBS Project in the Boké Prefecture



Note: The area planned to be exploited in the context of the MBS Project is shown in green in the bottom right box of the figure.

3.4 PURPOSE OF THIS SEIA

The SEIA developed for GAC's MBS Project is intended to assess the potential environmental and social impacts associated to the Project; in particular with respect to the road transport of the bauxite ore and the utilization of the KCT.

The exploitation of the mine on the Plateau 20 has been covered in the 2015 SEIA Addendum and is subject to all environmental and social mitigation and monitoring measures already identified in the Addendum.

Applicable information gathered during the social and environmental baseline studies in the context of the SEIA Addendum of 2015 were taken into account in the preparation of this supplementary study for the MBS Project. Specific information relative to the Project was also gathered through field studies undertaken by ERM and INSUCO between March and April 2016.

3.5 THE GUINEAN REGULATORY FRAMEWORK

Regulations on environmental impact assessments (EIA) in Guinea are defined by *ordonnance N°045/PRG/87 du 28 Mai 1987, modifiée par l'ordonnance N°022/PRG/89 du 10 Mars 1989, portant Code de la protection et de la mise en valeur de l'environnement (Order N°045/PRG/87 of 28 May 1987 modified by Order N°022/PRG/89 of 10 March 1989 defining the code for protection and valorisation of the environment)*. In addition, the *décret présidentiel 199/PRG/SGG/89 du 8 novembre 1989 codifiant les études d'impact sur l'environnement* (*Presidential decree 199/PRG/SGG/89 of 8 November 1989 defining the rules for environmental impact assessments*) defines projects subject to an EIA and its approval by the ministry in charge of environment. Lastly, *arrêté ministériel 990/ MME/SGG/90, du 31 mars 1990, définissant le contenu, la méthodologie et la procédure de l'étude d'impact sur l'environnement (Ministerial act 990/MME/SGG/90 of 31 March 1990 defining the content, methodology and process for environmental impact assessments)*, establishes the content, methodology, and procedures to be complied with when carrying out an environmental impact assessment.

The General Guide for Impact Studies, published in February 2013 has clarified the approval process of the SEIA. The entire submission and permitting procedure is managed by the *Bureau Guinéen d' Etudes et d'Evaluation Environnementale* (BGEEE – the Guinean environmental directorate). Formal review of the permitting documentation is undertaken by the *Comité Technique d'Approbation Environnementale* (CTAE), an ad-hoc multi-disciplinary team composed of representatives of various ministries relevant to the Project. The final environmental compliance certificate is issued by the Ministry in charge of environment. Final approval is under the responsibility of the ministry in charge of the Project – in the case of GAC, the ministry of mines. The Guidelines for Environmental and Social Impact Assessment for Mining Operations of February 2013 (*Directive de réalisation des études d'impact environnemental et social des opérations minières*) sets out specific guidelines with

regards to the procedure and the content of and environmental and social impact assessment for mining projects.

3.6 GAC'S APPROACH TO SOCIAL AND ENVIRONMENTAL RESPONSIBILITY

GAC has developed key operating principles that include protecting the health & safety of its employees, contributing to sustainable development and conducting business with integrity. GAC aims to work closely with host countries and communities, respecting their laws and customs and ensuring a fair share of benefits and opportunities. This defines the way GAC manages the economic, social and environmental challenges of its operations and are important to fulfilling the company's commitment to contribute to sustainable development.

The key HSSEC policies developed by GAC will be applicable to the Project. Key GAC policies that will be enforced throughout the Project lifecycle include:

- GAC Code of Business Conduct;
- GAC Environmental Policy;
- GAC Community Policy;
- GAC Health & Safety Policy;
- GAC Drug & Alcohol Policy; and
- GAC Procurement Policy.

3.7 INTERNATIONAL NORMS FOLLOWED BY GAC

Although GAC is not considering any financial support from international financial institutions (IFIs), GAC wishes to ensure that all the activities it performs comply with the Environmental and Social Performance Standards of the International Finance Corporation (IFC PS) as well as with the African Development Bank (AfDB) Integrated Safeguards System (ISS) and Operational Safeguards (OS).

The IFC Performance Standards (PS) relevant to the Project are:

- PS1: Social and Environmental Assessment and Management Systems.
- PS2: Labor and Working Conditions.
- PS3: Resource Efficiency and Pollution Prevention.
- PS4: Community Health, Safety and Security.
- PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources.
- PS8: Cultural Heritage.

The AfDB Operational Safeguards (OS) relevant for the Project are:

- OS 1: Environmental and social assessment;

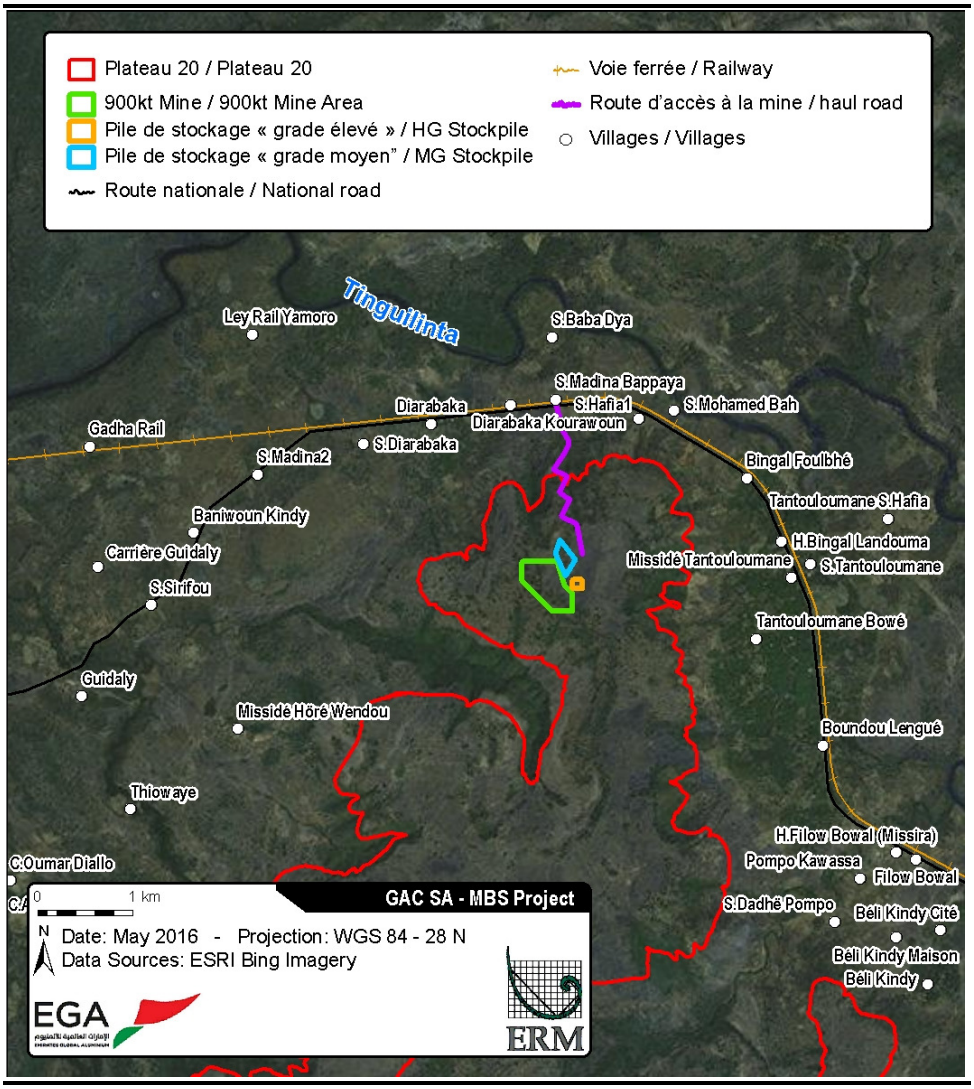
- OS 3: Biodiversity and ecosystem services;
- OS 4: Pollution prevention and control, hazardous materials and resource efficiency; and
- OS 5: Labor conditions, health and safety.

In addition, the World Bank Group / International Finance Corporation (IFC), Environmental, Health and Safety (EHS) Guidelines of April 2007 and AfDB relevant keysheets were used to provide specific guidelines on effluents and wastes management, and supplement Guinean regulatory standards, where the IFC standard or AfDB keysheets were found to be more stringent than the national standard.

4.1 OVERVIEW OF THE MINE

The location of bauxite resources to be mined north of Plateau 20 of GAC's concession, as well as the location of the proposed mining infrastructure, is shown in *Figure 4.1*

Figure 4.1 Mine site location north of Plateau 20 and stockpile locations



GAC intends to mine and export up to 300,000 tons (dry) of bauxite per year as of the second quarter of 2016 for a proposed Project life of 2 to 3 years.

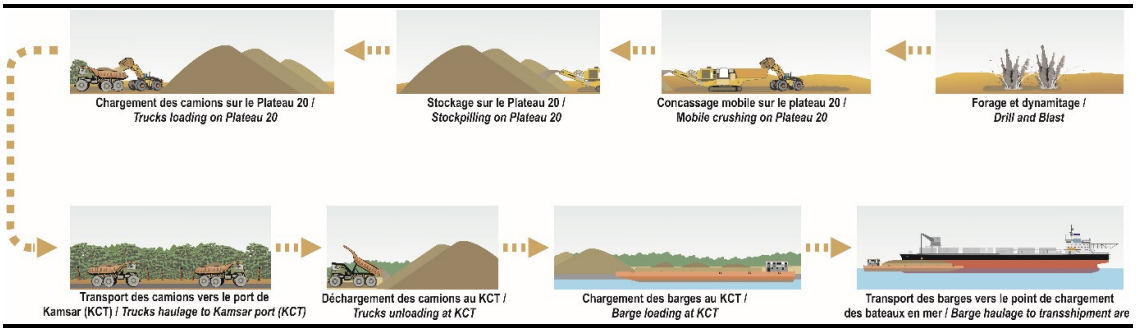
The actual duration of the Project may be less if long term contracts are successfully established beforehand.

The ore will be mined on the mine site north of Plateau 20 in an open pit. The ore will be loaded onto tipper trucks and taken to the mobile crushing plant where it will be crushed, sized, and then stocked on stockpiles before being loaded again onto trucks for transportation to Kamsar by road.

The indicative mining plan for Plateau 20 for the MBS Project is shown at *Figure 4.2*

The thin layer of topsoil covering the bauxite plateau will be removed and stockpiled in dedicated areas for future use as soil cover during mine closure and restoration activities. Overburden, which will be extracted in small quantities from the bauxite plateau, will be stored in a storage emplacement adjacent to the pit or less than 1 kilometer from the mining area, to be used during the concurrent rehabilitation of the pit.

Figure 4.2 ***Key stages in the mining process***



The mine will operate 10 to 12 months per year, depending on the intensity of the rains during the rainy season. Activities will take place on the basis of a 10 h day, 6 to 7 days a week (drilling bauxite excavation, loading and hauling, crushing, and loading on trucks for transportation to Kamsar). Blasting activities (to fracture the bauxite before extraction) will only occur during daytime and at a low frequency.

The mine site north of Plateau 20 will be connected to the national road RN22 via a 3 km haul road along the top of the plateau.

The Project does not expect mining activities to generate any significant quantity of mine water, since most of the bauxite reserves are located above the saturated zone.

4.2 *MINE INFRASTRUCTURE*

The mine infrastructure area at Plateau 20 will consist of a transportable administrative building built with containerized modules as well as a fit for purpose maintenance and reparation workshop for the mobile equipment fleet. The infrastructure area will also include a mobile crushing plant, ore

stockpile areas, and a truck loading zone. It will be located north of Plateau 20 outside the mined area.

In addition to the main facilities, the mine will also include:

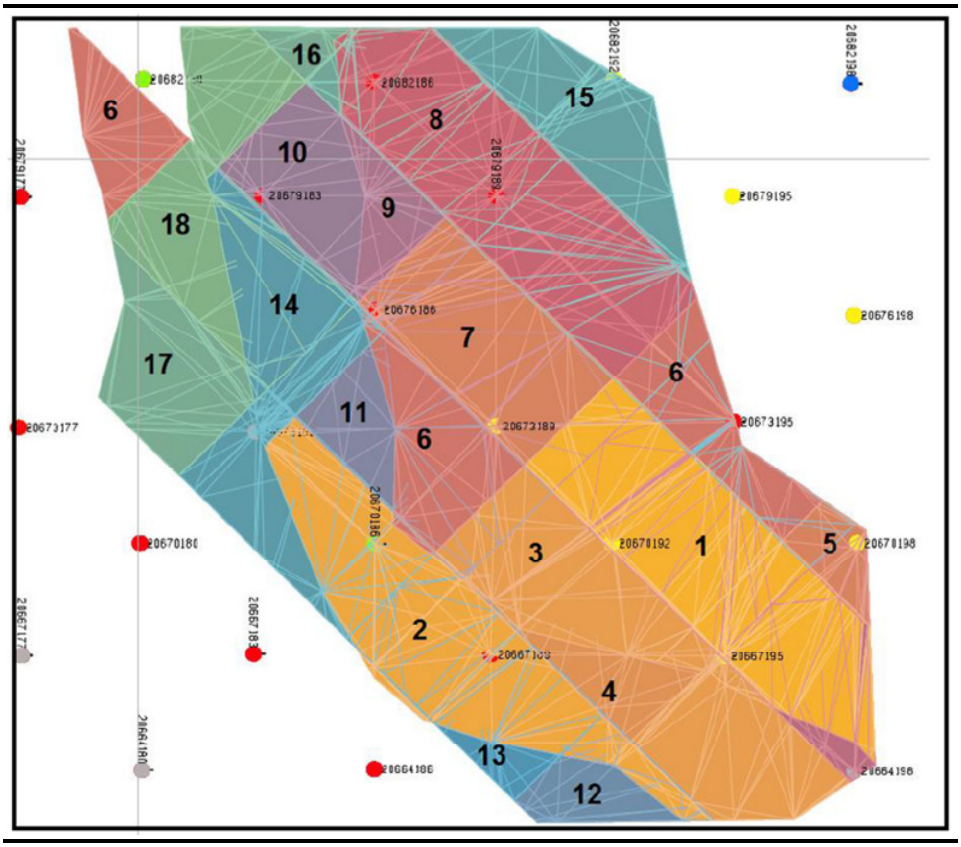
- a diesel-fueled power generator (500 kVA) to supply power to the infrastructure area of Plateau 20;
- a bulk fuel storage facility (10 to 50 m^3 above ground storage tank);
- an explosives storage area, already developed and permitted, and located in the northern half of GAC's concession;
- a fire system and associated water tanks;
- water storage facilities;
- wastewater and storm water collection and treatment facilities; and
- offices.

4.3 *PROGRESSIVE REHABILITATION AND MINE CLOSURE PLANNING*

The Plateau 20 mining plan for the MBS Project is based on grade control drillings in order to ensure adherence to product quality specifications suitable for export.

An outline of the indicative mining plan is shown in *Figure 4.3* below.

Figure 4.3 Outline of the indicative mining plan of Plateau 20 for the MBS Project



It is expected that mining activities on Plateau 20 under the MBS Project will be overtaken and significantly expanded as part of GAC's main bauxite export project. However, GAC reserves the possibility to temporarily cease activities should its commercial objectives for the MBS initiative be achieved sooner than expected. Under this scenario, the rehabilitation measures for Plateau 20 under MBS would be implemented gradually for the mined areas that are not expected to be reopened during the main bauxite export project, following the principles of the Mine Closure and Rehabilitation Plan developed in the 2015 SEIA Addendum. The rehabilitation would therefore consider aspect such as safety, drainage, and reinstatement of soils and ecosystems in a manner consistent with the natural environment and the land use plans agreed through the stakeholder engagement process.

4.4 BAUXITE TRANSPORT BY ROAD

Once the bauxite ore is crushed and sized, the fit-for-export bauxite will be loaded by front end loaders onto 40 ton capacity trucks. The loaded trucks will then take the haul road connecting the stockpile area to the existing national road. The trucks will then follow the national road over 90 km approximately, passing by the agglomerations of Tanéné, Boké, and Kolaboui, before reaching the Kamsar Container Terminal where the bauxite is to be exported by sea.

A haulage company will be contracted to load the bauxite onto trucks at the mine, transport the ore by road, and unload it at the KCT.

The road transport will take place during night time between 6 in the afternoon and 7 in the morning in order to limit the interference with the economic activities of the villages located along the road. The movement of trucks will be organized in 2 convoys of 8 to 10 trucks each performing 2 rotations per night. The number of trucks per night will be of 25 on average (1000 tons of carried ore) but could reach up to 40 during peak time.

A full Traffic Management and Risk Assessment Plan will be developed and implemented in order to ensure safe operation at all times through adequate logistics, in particular around the cities of Boké and Kamsar.

On arrival at the KCT at Kamsar, the contract hauler will off-load the bauxite ore into the designated storage bin or stockpile area. After off-loading, the empty trucks will return to the mine to be loaded again.

4.5 ROAD MAINTENANCE FOR MBS PROJECT ACTIVITIES

Based on the results of the ongoing road condition study for the national road connecting the mine site to Kamsar, and after consultation with local and regional authorities, GAC will undertake maintenance or road improvement

works as needed throughout the entire period of utilization of the road by the haul trucks under the MBS Project.

GAC also commits to rehabilitating the road at the end of the Project to mitigate any damage caused by its activities, while taking into account the use of the road by other heavy goods vehicles not related to GAC which could also have an impact on the conditions of the road.

4.6 PORT ACTIVITIES

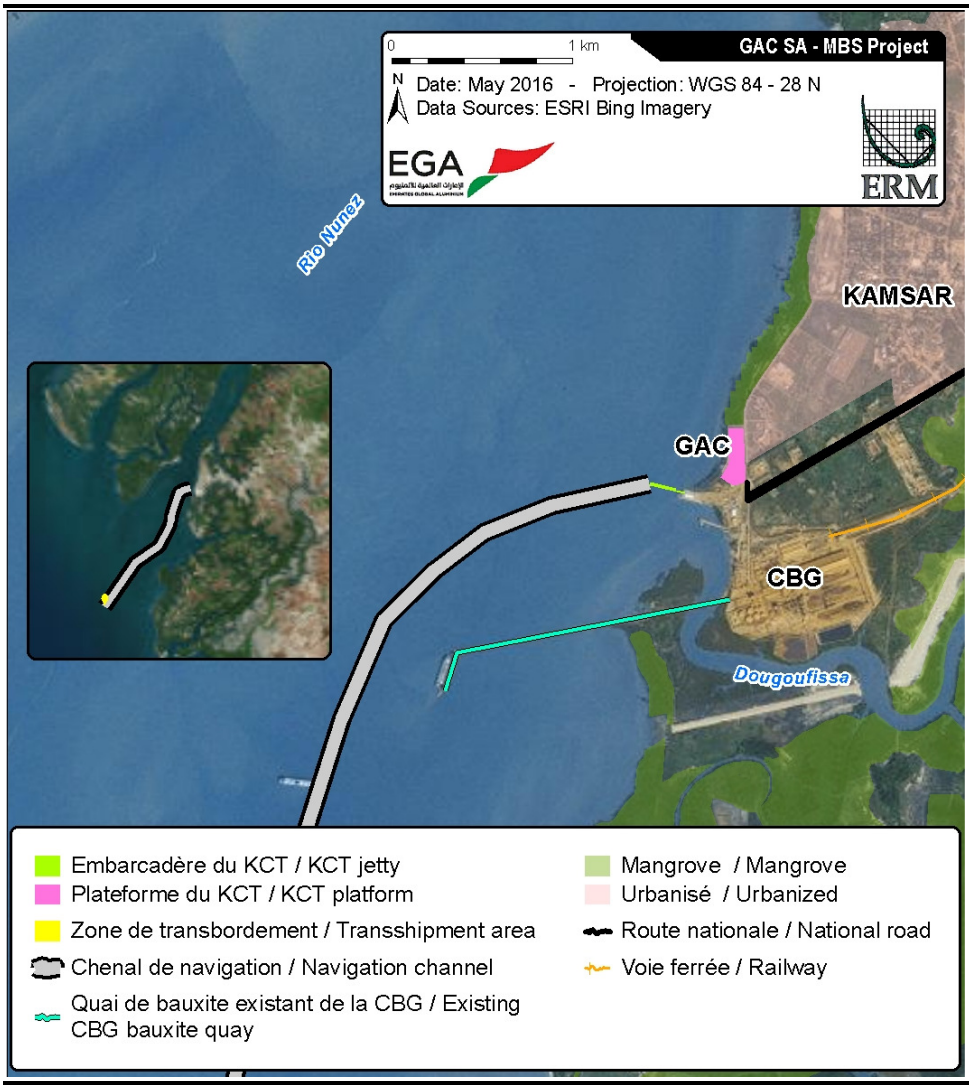
Port operations and bauxite loading activities for the shipment by sea will be carried out at the KCT area with a frequency of one shipment every 2 months, or 6 shipments per year, by 50,000 ton Supramax ships.

The ore transported by trucks from the mine will be off-loaded and stored at the KCT and will then be loaded on barges which will transit through the Rio Nuñez navigation channel to the transshipment location of the Supramax ships.

The ships will be loaded using barges of 7,000 to 10,000 ton capacity transiting through the navigation channel up to the transshipment location outside the channel.

The KCT location is shown at the *Figure 4.4*

Figure 4.4 KCT location



GAC had previously developed an expansion of the KCT and dredged the navigation channel in the area near the KCT quay to a depth of 6 to 8 m in order to facilitate navigation. The KCT is currently comprised of a terrestrial platform and a jetty, which GAC has also extended recently.

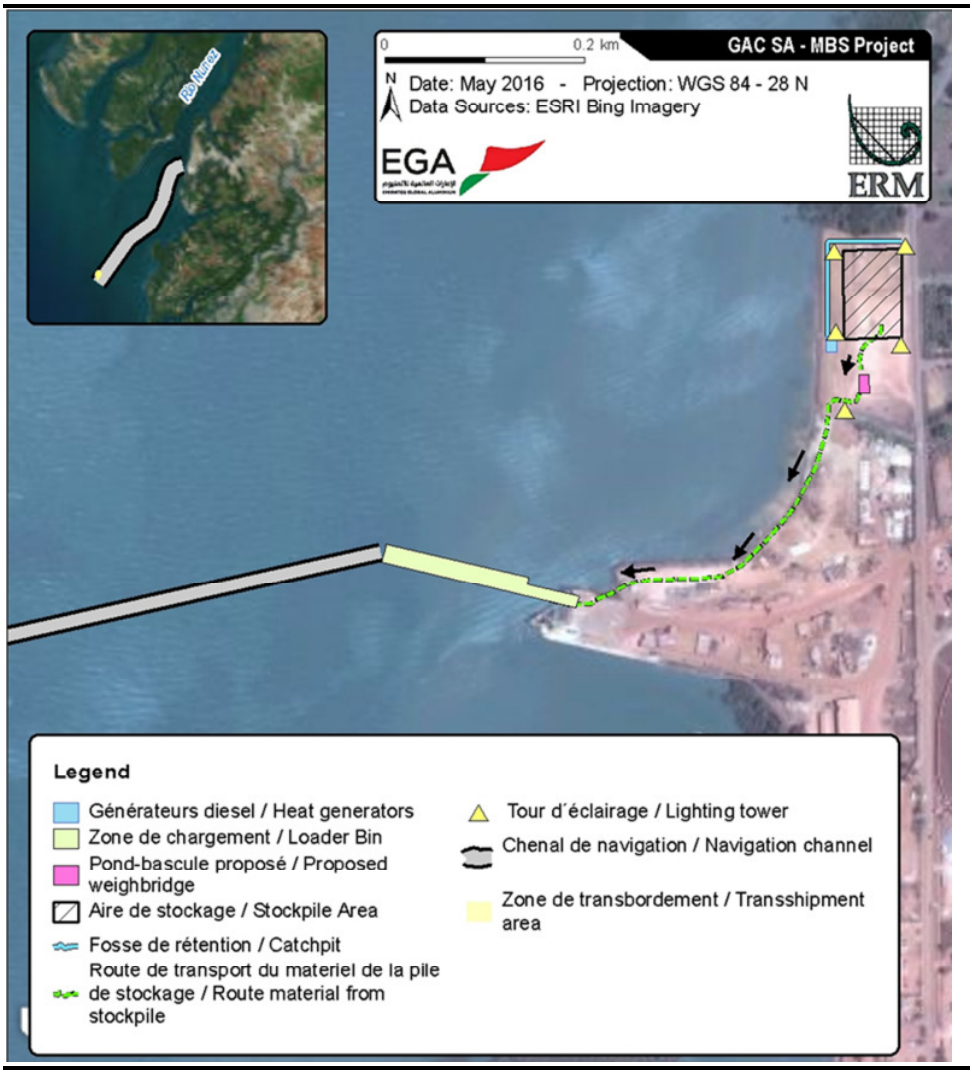
For the purpose of the MBS Project, the KCT platform will include a haul terminal with truck discharge facilities, a weighbridge to weigh the trucks on arrival at the KCT, a bauxite stockpile area, and a reclaiming and haul operation system to transport the bauxite to the jetty where it will be loaded on barges using a telescopic barge loader.

The jetty will also be equipped with a berth with mooring facilities for the tugboats and 7,000 to 10,000 ton barges for the transfer of the bauxite to the transshipment location where the ore vessels will be loaded. The

transshipment location is located at an approximate 25 km distance at the end of the channel.

Supporting equipment and auxiliary facilities, including diesel generators and fuel storage stations will also be installed on the KCT platform.

Figure 4.5 General overview of the KCT layout



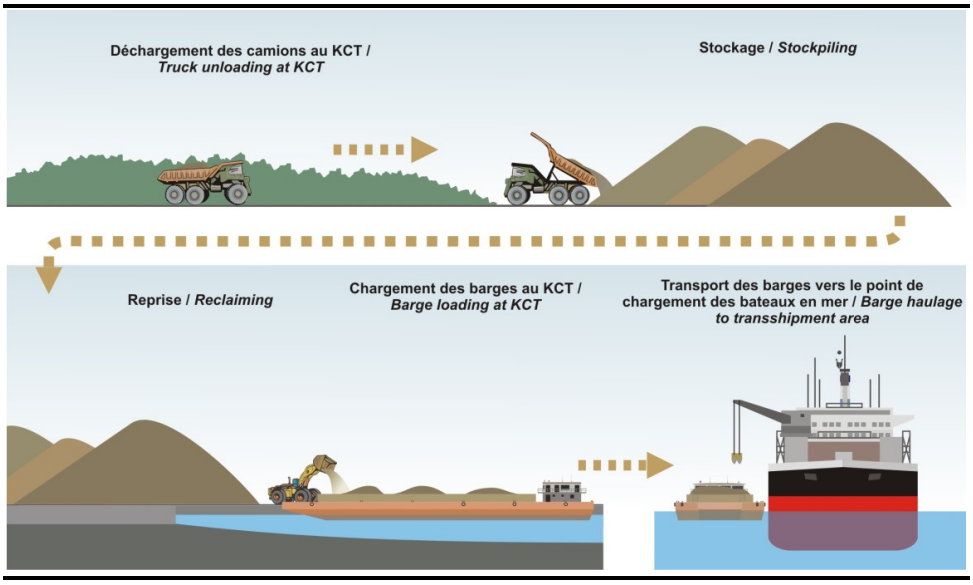
Key activities to take place at the KCT will be as follows:

- weighing of the haul trucks entering the KCT using the weighbridge;
- unloading of the haul trucks by rear dump to the bauxite stockpile of approximately 40,000 ton capacity;
- bauxite reclaim from the stockpile using wheel loaders;
- transfer of the bauxite to the telescopic barge loader at the KCT jetty;
- barge loading using the telescopic loader; and

- towage of the loaded barge using a tugboat through the Rio Nuñez channel to the transshipment location outside the channel.

The proposed activities at the KCT are illustrated in the *Figure 4.6*

Figure 4.6 Main phases of the proposed KCT operations



The port infrastructure area will be supplied by diesel generators. The power requirements are currently estimated at less than 1 MW.

Water supply for KCT operations will be made available by using the existing water sources installed at the KCT. It is estimated that water needs for operations will be minimal and will amount to 100 to 200 m^3/d.

4.7 *DREDGING OF THE NAVIGATION CHANNEL NEAR THE KCT*

Considering that the section of the navigation channel that was initially dredged by GAC during the improvement works around the KCT has been partially backfilled due to the marine currents, maintenance dredging will be necessary. The maintenance dredging will be carried out regularly to ensure a depth of 6 to 8 meters is maintained to allow for the smooth movement of the barges around the KCT. While the dredging techniques used will be those described in the SEIA Addendum of 2015 for the bauxite export project, the volume of soil dredged for the MBS Project will be significantly smaller to that of the main project (an estimated 200,000 m^3 per year for MBS as opposed to 6 million m^3 for the first phase of dredging for the bauxite export project).

4.8 *TRANSSHIPMENT OPERATIONS*

The 50,000 ton Supramax ore vessels will be loaded using 7,000 to 10,000 ton barges which will transit through the navigation channel up to the transshipment location outside the Rio Nunez located about 25 km from the KCT jetty.

Key loading and transshipment activities will be the following:

- the tugboat and loaded barge will navigate through the navigation channel up to the transshipment location outside the channel;
- the tug will assist in securing the barge to allow the transshipment of the cargo; and
- upon completion of the unloading operation the tug will escort the barge back to the KCT jetty for reloading with bauxite.

Considering the barge capacity of 7,000 to 10,000 tons and the Supramax ships capacity of 50,000 tons, it is anticipated that 5 to 7 barge loads will be necessary to fully load a Supramax ship. This implies that each ship will have to remain at anchorage at the transshipment location for 7 to 10 days until de transshipment operation is complete.

4.9 *KEY PROJECT ALTERNATIVES CONSIDERED*

The SEIA Addendum presents various alternatives that were considered by GAC as part of the Project definition process, with a view to maintaining an acceptable balance between technical and commercial feasibility and environmental and social impacts and benefits.

The key alternatives considered and the preferred options are as follows:

- Bauxite haulage from the mine to the port. Ultimately, road transport was considered the best option mainly in terms of commercial feasibility and Project timeframes.

- Schedules for the road transport of bauxite. Two schedule options were considered: daytime transport and nighttime transport. The night alternative was selected in order to reduce the travel time for the transport of the bauxite and to limit the risks of interfering with the public and reduce the risks related to road safety for road users.

- Choice of trucks to transport the bauxite from the mine to the port. The type, dimensions, and the exact number of trucks will be determined by the contractor responsible for the haulage based on the results of study regarding the conditions of the road between the mine and the port.

- Truck movements for the haulage of bauxite to the port of Kamsar. Two options were studied: movement of trucks in convoys or separately. The movement in convoy was selected. This will translate into 2 convoys of 6 to 10 trucks each, performing 2 rotations per night with an average of 25 trucks per night and a maximum of 40 during peak times. This option limits the interference with other road users and populations living along the road by reducing the frequency of passage. It therefore allows a better control of the impacts of the Project in terms of road safety, noise generation, and interference with other road users.

Prospective workforce numbers for the Project (including subcontractors) are as follows:

- Construction: around 20 people at the mine, and between 20 and 30 people at the port.
- Operation: between 100 and 200 people at the mine, and between 50 and 70 at the port.

The ratio of supervisory to execution and support-level staff is expected to be 10% to 15%.

Workforce will be recruited locally where possible, based on available skills, competence, and professional experience.

With respect to the transport of bauxite by road, GAC estimates that approximately 50 contract haulers will be needed. Recruitment of the contract haulers will be carried out through the haulage company. Employees will be primarily local, subject to adequate qualifications as drivers of heavy goods vehicles.

Through the EGA/ GAC Code of Business Conduct, GAC is committed to equal opportunity, freedom from harassment, worker security and zero harm to health and safety of its workforce. This is transcribed into GAC's human resources processes and health and safety policy and operational procedures.

6 SUMMARY OF SOCIAL AND ENVIRONMENTAL IMPACTS ADDRESSED IN THE SEIA

Applicable information collected as part of the environmental and social baseline studies conducted for the 2015 SEIA Addendum were taken into account in the preparation of this new SEIA for the MBS Project, in particular for the mine and port areas. Project-specific data was also collected regarding the road area through fieldwork studies conducted by ERM and INSUCO between March and April 2016.

Some of the impacts identified for the mine and port areas are similar to those described in the SEIA Addendum for GAC's bauxite export project, but are however much more limited considering the reduced scale and duration of the MBS Project compared to the main project.

As for the bauxite haulage, aspects relative to the road transport received a particular attention in this study since the road area had not been covered in the 2015 Addendum.

6.1 SEIA REPORT ORGANIZATION

The SEIA report is presented in one single volume covering the environment, the social studies, and an Environmental and Social Management Plan. The report is divided in chapters addressing the different project components (mine, road, and port) and covering the most significant impacts in detail. The significance of the impacts being addressed was determined based on the magnitude of the impact and its novelty compared to the impacts previously assessed in the 2015 SEIA Addendum.

The chapters regarding the environment and the social studies all follow a similar structure and present information on:

- Baseline conditions, i.e. existing environmental and/or social conditions, prior to Project development.
- The expected significance of potential impacts, both negative and positive: in other words, the importance of environmental and social changes that may result from the Project, across the Project life. This has included a comparison of predicted changes with relevant standards.
- Mitigation or enhancement commitments: the measures the Project proposes to implement in order to avoid, reduce, mitigate and/or compensate for negative impacts, and to enhance the benefits of the Project through design and operation.

6.2 THE NATURAL ENVIRONMENT

6.2.1 Key topics addressed in the SEIA

The SEIA covers the topics outlined in the *Table 6.1*:

Table 6.1 Environmental topics addressed in the SEIA

Topic	Mine site (Plateau 20)	Road	Port
Air quality	Included	Included	Included
Noise and vibration	Included	Included	Included
Soils / Geology	Included	Not relevant	Not relevant
Surface water	Included	Not relevant	Included
Ground water	Included	Not relevant	Included
Topography and visual resources	Included	Not relevant	Included
Terrestrial biodiversity	Included	Included	Included
Freshwater ecology	Included	Not relevant	Not relevant
Waste and hazardous materials	Included	Not relevant	Included
Marine physiochemical environment	Not relevant	Not relevant	Included
Marine biodiversity	Not relevant	Not relevant	Included

Air quality, noise, biodiversity and water related issues received additional focus as these are areas where potential impacts may be significant – which led to particular focus on the definition of appropriate mitigation measures.

6.2.2 Air quality

6.2.2.1 Mine

Ambient air quality monitoring data collected at receptor points north of Plateau 20 indicates that background concentrations of air pollutants (NOx, NO_2 and SO_2) and dust particles are significantly lower than the limits set by international standards and Guinean norms relative to air quality, suggesting that the airshed around Plateau 20 can be considered as of reasonably good quality. Occasional elevated levels of air pollution may occur locally, due to local community activities – mainly from slash and burn agriculture, domestic woodstoves, and emissions from poorly maintained vehicles.

The Project at the mine area will primarily generate dust emissions from occasional blasting, vehicle traffic on unpaved haul roads and other unpaved road surfaces, and from ore crushing and handling. Fossil fuel combustion emissions will also result from power generation at the mine site (anticipated to be of limited significance), and also, from the exhausts of the mine vehicle fleet composed of haul trucks, front-end loaders, and other vehicles.

The impact will occur primarily during the operations phase and during the haulage of bauxite by truck on the haul road connecting the mine site to the national road RN22. In fact, results of the dust dispersion modelling studies suggest the possibility of a significant increase in the concentration of particles during the passage of trucks on the haul road near the intersection with the national road.

As part of the construction phase, the Project will however develop specific measures in the management of air emissions, based on international good practices. It will cover aspects such as the avoidance of exposed surfaces, soil and cleared areas re-vegetation, prohibition of open burning of cleared vegetation and waste and the implementation of permanent dust suppression systems.

In addition of implementing good international practices for the use and the maintenance of the equipment as operational mitigation measures, GAC will also take into account the air emission rates of the equipment during its purchase (except for the haul trucks, which will be supplied by the subcontractor, subject to compliance with Guinean legislation).

Dust resulting from vehicle traffic on unpaved surfaces (only a risk during the dry season) will be reduced through standard dust controls, including water spraying.

Dust resulting from vehicle traffic on unpaved surfaces (only a risk during the dry season) will be reduced through standard dust controls, including water spraying.

An air quality monitoring program will be developed and implemented to confirm the modeling results and measure the Project compared to the applicable targets. If impacts are determined to exceed World Health Organization (WHO) criteria the option to relocate and compensate additional affected people will be considered. With the measures presented above and the accompanying monitoring program the Project will ensure air quality standards are met and that the magnitude of the impact on ambient air quality is negligible or minor.

6.2.2.2 Road

Ambient air quality measurements collected along the road were partially taken from the 2015 SEIA Addendum (for the mine area and Kamsar), and complemented with targeted dust measurements taken during the baseline fieldwork study in April 2016 at different locations along the national road. The results of these measurements indicate that concentrations of air pollutants (NOx, NO_2 and SO_2) along the road are below the limits set by international and national guidelines with respect to air quality, which

suggests that the airshed in the national road area is of reasonably good quality, including in Kamsar.

As for the mine area, a computer model was used to predict the effect of the Project on air quality along the national road between the mine site and Kamsa, and the predicted concentration levels of air pollutants were compared to IFC EHS guidelines and WHO air quality interim targets. Impact significance of the MBS Project on ambient air quality has been determined based on the results of this modeling.

The results of the modeling study show that impacts on air quality will be limited, although some impacts may occur at some points along the road. These impacts will be primarily linked to the increase in short term NO_2 concentrations caused by the movement of trucks transporting the ore on the national road.

In order to mitigate these impacts, the Project will develop specific measures for the management of air emissions based on international good practice, including compliance with level II emissions limits of the US EPA and appropriate maintenance of vehicles. The haulage subcontractor will be required to prepare an environmental and social management plan subject to approval from GAC. In addition to road safety, this plan will also take into account potential impacts relative to air quality, noise, as well as the protection of water sources and biodiversity.

6.2.2.3 Port

The port context varies from that of the mine area as the port terminal is surrounded by urban developments (city of Kamsar) and industrial facilities (CBG bauxite processing, storage and export complex). Air quality monitoring data for the port area was obtained as part of the studies undertaken for the 2015 SEIA Addendum. The data indicates that the airshed around Kamsar is relatively good.

The main sources of airborne dust during the operation of the port terminal will be the handling of ore at the KCT (unloading and loading) and the wind blowing on exposed surfaces. NO_x and SO_2 emissions will be mostly related to power generation at the site and movement of the vehicles and mobile equipment used for the loading and unloading activities.

The impacts on air quality in the KCT area will be very limited to the port, and will be negligible in the urban area of Kamsar. GAC will implement international best practice measures to reduce dust generation and exhaust emissions, including installation of wind breaks and water sprays, and appropriate maintenance of generators, equipment and vehicles, will keep impacts within acceptable levels.

6.2.3 Noise

6.2.3.1 Mine

Noise and vibration measurements were taken in 2015 for the SEIA Addendum at sensitive receptors identified in the surroundings of the mine of Plateau 20. The analysis of these measurements suggests that the baseline acoustic environment in the mine area is relatively low and typical of rural areas of Guinea, and does not show any critical situations in terms of noise levels, except for receptors in the vicinity of the existing railway and national road. Additional noise measurements have been recorded by ERM in April 2016 at the intersection of the mine haul road with the national road RN22, and at the exit of Diarabaka village also located along the RN22.

The primary source of impact related to Project activities is linked to the operations of the mobile crushing plant, pit operations, and to the movement of vehicles on the haul road connecting the stockpile area to the national road.

The significance of Project-related impacts on the acoustic environment has been determined based on the results of modelling studies while taking into account the specificities of the MBS Project and the reduced scale of the activities planned for the mine area.

Noise impacts will be confined to the immediate vicinity of the works and therefore shouldn't affect neighboring communities except for one dwelling located near the crossing of the planned haul road and the national road.

Noise generated by mine operation and ore transportation is predicted to cause limited impacts on neighboring human receptors identified in the mine area, since the nearest receptor is located over 2 km away from the area to be mined. Nevertheless, being located in the vicinity of the intersection between the haul road and the national road, this receptor will be more heavily impacted during the ore transport on the haul road. As such, if deemed necessary and based on consultations with the impacted population, the dwelling and associated lands may be moved in accordance with GAC's resettlement and stakeholder engagement strategy developed for the main bauxite export project.

GAC proposes reducing noise impacts from the Project by:

- considering noise levels in selection of equipment;
- providing noise shielding and barriers where possible;
- restricting noisy activities to daytime as much as possible; and
- implementing appropriate traffic management rules to limit the occurrence of noisy vehicle traffic activities at night and in the close vicinity of community settlements.

6.2.3.2 Road

Based on the results of the noise measurements taken along the national road during the April 2016 field mission, the baseline acoustic environment is characterized by a high noise level, in particular in the urban centers primarily due to the road traffic but also due to human activity in the cities and villages. The acoustic environment is severely impacted in the portions of the road along the railway due to the recurring passage of trains between Sangarédi and Kamsar.

The impact assessment for noise generated by the Project along the national road relies on a noise modelling study which is based on the results of noise measurements taken during the April 2016 mission and on road traffic data for the national road. Modelling studies were carried out for daytime and nighttime traffic. The results were compared to applicable international norms and appropriate mitigation measures were proposed.

Considering that bauxite road transport is planned during nighttime hours (between 6pm and 7am), main impacts from Project noise emissions will be associated to the disturbance of the residents along the national road.

During nighttime hours, Project contribution to ambient noise levels will be of 0.5 to 3 dB, which corresponds to an impact of negligible significance.

Based on WHO recommendations relative to sleep disorders, 52 dB (A) is the noise limit that should not be exceeded more than 10 to 15 times per night. These recommendations should be respected by the MBS Project, since it is anticipated the passage of 4 convoys of 8 to 10 trucks both ways, which amounts to 8 noise events per night.

In urban centers, noise levels caused by the passage of the truck convoys should not be significant in comparison to the current noise levels. Finally, in the areas where the national road goes along the railway, the noise contribution of truck traffic will be lower than the noise emissions from the railway traffic.

In order to reduce the nuisance caused by the increase in noise emissions along the national road, GAC will implement noise-specific mitigation measures before and during the Project. These measures will include maintaining the vehicles in good condition to ensure that engine noises are limited, and to the extent possible, using trucks designed with silent technology (e.g. Trucks equipped with suspension airbags and aluminum bodies which primarily reduces the noise made by trucks when empty). GPS boxes will also be installed on the vehicles in order to control their speed along the road.

GAC will ensure that trucks do not exceed the speed limit of 30 km/h in urban areas. Drivers will also receive an awareness training to limit noise-

induced nuisance by adopting a "soft" driving approach (such as avoiding accelerations and sharp brakes).

6.2.3.3 Port

The environment around GAC's port area is noisier than the mine area, given the presence of the city of Kamsar and the industrial facilities (CBG mainly) south of the KCT. However, considering the absence of human receptors in the vicinity of the KCT, the impact of the Project's port activities is considered negligible. Similarly, given the industrial environment around the KCT, the Project should not induce significant changes to the existing noise environment in the port area.

Nonetheless, GAC will ensure that noise levels from port operations are kept as low as reasonably practicable, through equipment selection, appropriate operations and maintenance, and, if necessary, the implementation of noise barriers around key sources of noise on the site.

The Project will also result in the generation of underwater noise in the marine environment during the periodic maintenance dredging activities and the movement of barges along the navigation channel. The impacts are expected to be minor given the low magnitude of these sources of noise, their limited duration, and their sporadic frequency.

6.2.4 Soils

The construction phase is expected to cause only limited disturbance of soils due to the construction of the haul road connecting the mine to the national road RN22. Since the Project will use mobile equipment and mining infrastructure it will therefore not require any clearance of vegetation.

During mine operation, a progressive clearance of vegetation and soils will be carried out ahead of mining activities. Topsoil will be set aside and stored for use in subsequent rehabilitation. Overburden and low grade bauxite will be stored within or near the pits.

In order to minimize land loss during construction and operation of the mine, the area of land to be occupied by the mining project will be kept to the minimum necessary to perform the works. Within this area, the productive soils will only be removed where necessary and affected land will be returned to original use as soon as possible after completion of construction or after closure of the mine.

At Kamsar, the layout works will take place at the existing hard standing platform of the KCT and the current footprint is not planned to be extended.

6.2.5 Integrated water management

6.2.5.1 Mine

The main surface water body in the Project area is the Tinguilinta River north of Plateau 20 and some of its secondary tributaries that may potentially be affected by mining activities in their upper headwaters. There are no main tributaries of the Tinguilinta running through Plateau 20.

Information on surface and groundwater flows and water quality has been collected through the 2015 SEIA Addendum process, and the uses of water resources were surveyed across a wide area focusing on both community and biodiversity receptors.

The main sources of impact on the flow and quality of surface water will be the clearance of vegetation and the storage of soils, as well as mine operation and waste production. These impacts have been assessed as limited given the absence of permanent rivers in the Project's area of influence. Nevertheless, the presence of seasonal streams across Plateau 20 suggests that potential impacts on these water streams could affect ecological receptors that are sensitive to surface water quality and flow conditions, and may also compromise the availability of water for downstream water users, especially during the dry season.

In order to manage these impacts on water, the Project will develop a Mine Water Management System (MWMS) for the management of all surface water use and discharges to avoid or mitigate any significant impacts on hydrological and ecological conditions. Specific measures will include a flood management plan, monitoring of surface water flows, and a water runoff collection system.

The options for water management currently under study by GAC include:

- re-using mine runoff water temporarily stored in runoff retention ponds;
- water pumping using a groundwater bore field in a deep aquifer (approximately 100 m); and
- water pumping from the Tinguilinta River.

Given the lower water levels and flows in the Tinguilinta during the dry season, GAC will establish strong restrictions on the pumping of water in the river in order to maintain a flow limit during the dry season and ensure that needs of communities and ecosystems downstream are met.

As for groundwater quality, potential impacts during mine operation would be mainly due to accidental spills of fuel or maintenance chemicals. These potential impacts will be mitigated through an appropriate

Hazardous Materials Management Plan, covering hazardous material storage, as well as effluent and waste controls, in line with internationally accepted practices, to avoid the risk of soil or groundwater contamination.
GAC will also adopt appropriate procedures for spill response planning and subsequent cleanup

6.2.5.2 Road

In the road area, the main sources of impacts on surface water quality along the national road will relate to the waste produced by truck drivers (domestic wastes, oil, etc.). Similarly, potential road accidents involving the trucks and occurring near a bridge or water stream could also impact surface and groundwater quality if spills occur.

In order to manage the Project's impacts on water, GAC intends to implement a Waste Management Plan and to provide environmental awareness trainings to drivers regarding proper management of personal waste, such as the prohibition of throwing waste out of the window. The implementation of the Global Road Traffic Management and Risk Evaluation Plan will also include trainings and awareness rising for truck drivers, implementation of driving rules, speed limits, etc.

6.2.5.3 Port

Potential impacts on surface water and groundwater water in the port area are mostly related to surface contamination risks due to runoff or accidental spills from construction sites, fuel storage or bauxite stockpile area. A port drainage and water discharge management system will be put in place during construction to reduce the impact of the port operations. The hazardous materials management plan and spills response plans will cover all hazardous material storages, including fuels, lubricants or other chemicals.

As for the marine environment at the port, potential impacts are mainly associated to the risks of accidental spills from barges or ore vessels. These impacts are assessed as being limited considering the low intensity of activities and the implementation of good practices preventing discharges at sea.

GAC also intends to put in place a dust suppression system, an environmental and social management plan for dredging activities, and a waste management plan including ballast water management. The measures developed will all comply with Guinean legislation and international norms, including the IFC guidelines and the requirements of IMO/MARPOL relative to discharges to sea.

6.2.6 Biodiversity

6.2.6.1 Mine

GAC is currently working on developing a biodiversity action plan covering all of its activities at the mine area and at Kamsar and determining approaches for the preservation of sensitive habitats and species, both on and off site, through the use of compensation strategies.

As presented, the proposed mining activities for the MBS Project will require vegetation clearance on top of the mining resources north of Plateau 20 for a period of 2 years.

The biodiversity of the mining area has been surveyed over the past 10 years since the start of the SEIA work by GAC. Dedicated field biodiversity surveys were undertaken for this SEIA report, focusing on the northern portion of Plateau 20.

The area north of Plateau 20, intended to be used for the MBS Project, contains few habitats of high conservation value (including few if any forest galleries and wooded savannahs). The vegetation communities that will be most affected by the vegetation clearance are the bowal and grassland savannah on the bauxite plateau. The wooded savannah on the edges of the plateau and the slope mosaics along the hills between the bauxite plateau and the national road are not expected to be affected significantly.

In order to reduce the impacts related to the Project's direct footprint on the biodiversity, GAC has conducted specific pre-clearance field surveys with a particular focus on large mammals, amphibians, and herpetofauna to determine with precision the extent to which the study area presents particular terrestrial biodiversity sensitivities. Habitats of conservation value will be avoided to the maximum extent practicable, and it is expected that the planned haul road for the bauxite transport will avoid the wooded savannah habitats.

Based on preliminary results of the biodiversity inventories developed during the pre-vegetation surveys conducted in the study area, one sensitive floral species has been identified while another one may also be present given the types of habitats in the area. Similarly, West African chimpanzees *Pan troglodytes verus* (listed as Endangered (EN) according to the IUCN) have been observed (nests and trap-cameras) near the area to be mined ant the planned haul road. The mine area of the MBS Project may therefore be considered as sensitive in terms of conservation due to the presence of this species.

Two other threatened mammal species have also been identified in the area during the biodiversity inventories: the Sooty Mangabey *Cercocebus atys* (Vulnerable (VU) according the IUCN) and the Bourlon's Genet *Genetta bourloni* (VU). Two species of birds with conservation value; the Denham's Bustard *Neotis denhami* (Nearly-Threatened (NT) according to the IUCN) and

the white-backed vulture *Gyps africanus* (Critically Endangered (CR) according to the IUCN) have also been observed flying over the area but not nests have been identified. The critically endangered (CR) gecko species *Hemidactylus kundaensis* and the Red Colobus *Procolobus badius temminckii* sub-species (EN), which were recently identified in other areas of the GAC concession or in surroundings concessions have not been observed north of Plateau 20 during these inventories.

The three main impacts that will be limited to the extent possible are: habitat deterioration or loss, fauna disruption, habitat fragmentation and risks of collision of Project vehicles and equipment with wild fauna.

The loss of habitat associated with the Project footprint will be limited given the reduced scale of the MBS Project activities, the temporary nature of these activities, and the minor sensitivity of the affected habitats (bowal and grassland savannahs). What is more, habitats with conservation value will be avoided.

The Project will implement additional measures to limit its impact on fauna including: lighting reduction at facilities and pointing the light downwards, 30km/h speed limit for trucks, vegetation clearance on one front only to allow species to flee, installation of noise-reducing equipment on vehicles, employee training on good conservation practice, etc.

Finally, after the end of mining activities in a particular area, GAC will move to the closing phase of the mine along with the rehabilitation of mined areas. This will include the progressive revegetation and reforestation of mined areas, while taking into account the rehabilitation objectives for natural habitats and the usage plans determined in consultation with local communities and authorities.

The impact on freshwater ecosystems in the study area has also been assessed and it has been concluded that the operation phase will be the primary source of impact. Potential impacts may generate deterioration and modification of freshwater habitats and of the biodiversity of freshwater ecosystems. However, given the absence of sensitive freshwater habitats in the area, Project impact is expected to be limited.

All the impact management approaches discussed above relative to natural habitats and biodiversity will be detailed in the Biodiversity Action Plan currently under preparation by GAC.

6.2.6.2 Road

The primary impact on terrestrial biodiversity associated with the transportation of bauxite is the increased risk of collisions between the haul trucks and wild fauna along the national road, in particular during the night in rural areas. This impact is expected to be limited considering that the

national road existed prior to the Project, is heavily used, and goes through several residential areas along its path. As such, the presence of wild animals is expected to be very limited along the road due to the strong human presence.

In order to limit as much as possible the risk of collision with wild fauna, GAC will implement a Global Traffic Management and Risk Assessment Plan taking into account this particular risk.

Finally, the movement of the haul trucks on an existing road supports the assumption of the absence of potential impacts on flora.

6.2.6.3 Port

The terrestrial and semi-aquatic habitats identified in the port study area correspond to degraded mangrove habitats. These habitats will not be directly affected by the MBS Project since none of the activities are expected to destroy existing terrestrial habitats. As for the KCT, the terrestrial fauna is nearly non-existent.

The main Project-related interactions with the marine environment will relate to noise emissions from Project activities with potential impacts on marine fauna, in particular due to the movement of barges along the navigation channel and the maintenance dredging activities near the KCT. As indicated in the environmental and baseline chapters regarding underwater noise, some noise-sensitive species may potentially be present in the Project influence area, including the Atlantic Humpback Dolphin, the manatee, and some sea turtles.

Noise impacts on marine fauna are expected to be limited however, due to the short-term duration of noise-generating activities, their limited frequency, and low noise emissions.

To a limited extent, maintenance dredging activities near the KCT may potentially lead to disturbances on the marine seabed and associated benthic communities. The footprint of dredging activities relative to the size of the estuary is however quite limited, and in addition, the directly affected natural environment is considered to be already modified due to previous dredging activities undertaken in the area. In addition, the volumes dredged will be significantly smaller than the volumes planned for the first phase of dredging for GAC´s main bauxite export project.

In order to reduce as much as possible the potential impacts from dredging, GAC will implement a Dredging Environmental and Social Management Plan (DESMP) as defined in the 2015 SEIA Addendum.

6.3 THE HUMAN ENVIRONMENT

6.3.1 Key topics addressed in the SEIA

The SEIA covers the topics presented in the *Table 6.2.*

Table 6.2 Aspects relative to the human environment addressed in the SEIA

Topic	Mine site (Plateau 20)	Road area	Port Area
Local governance	Not applicable	Included	Not applicable
Demography and social dynamics	Included	Not applicable	Included
Mobility and transport	Included	Included	Included
Well-being, health and safety	Included	Included	Included
Access and use of natural resources	Included	Included	Included
Employment and economic activities	Included	Included	Included
Infrastructure and basic services	Included	Included	Included
Cultural heritage	Included	Included	Not applicable

The aspects that may potentially lead to significant impacts for the Project were addressed with particular attention in SEIA, which led to a particular focus on determining appropriate mitigation measures. The main aspects identified are the following: mobility and transportation; well-being and health and safety; infrastructures and basic services; employment and economic activities; and access and utilization of natural resources. The presence of the workforce in the Project area also came out as recurring theme in the evaluation.

6.3.2 Well-being, health and safety

6.3.2.1 *Maintaining a high level of leadership on health, safety and the environment*

Through their corporate code of conduct and HSSEC policies, GAC aspires to establishing and maintaining a high level of health and safety leadership across its organization. This is supported by existing processes and procedures for health and safety management, employee awareness and training programs, as well as community awareness campaigns through GAC's stakeholder engagement activities.

As the Project evolves, particular attention will be given to community safety through safe vehicle operations, delineation of hazardous areas, preparation and delineation of hazardous activities, as well as community information and awareness on the specific health and safety risks associated with GAC's activities.

Similarly, GAC will ensure that it has the right processes for the management of waste and hazardous materials, to limit the risks of exposure of workers,

communities or the environment to such materials. Generally speaking, the Project will make limited use of hazardous materials (except for diesel fuel and small quantities of maintenance chemicals).

6.3.2.2 Managing the Project´s impacts on community well-being, health, and safety

In the mine area, the presence of construction machinery and ore transport vehicles may translate into a moderate increase in the risks of road accidents, mainly near the crossing of the planned haul road and the existing national road during the haul road construction and the transport of bauxite ore along the haul road.

As for the transport of bauxite on the national road, the daily increase in traffic and the potential degradation of the road may lead to significant traffic disturbances and an important reduction in road safety. The impact would be particularly severe if the transport were to occur during daytime, considering the high intensity of existing traffic, the presence of several social infrastructures and daily markets and economic activities taking place on the sides of the road, as well as regular sports events and religious ceremonies and the presence of vulnerable users (pedestrians, school children, bicycles, etc.). In order to adapt to the existing context and after assessing possible alternatives during Project design, GAC has therefore decided to restrict the bauxite transport to nighttime hours, between 6pm and 7am outside the periods of high activity.

In order to prevent impacts on road safety in the mine area and along the national road, GAC will establish a road traffic plan for construction and mining machinery as well as for the vehicles transporting the bauxite ore. GAC also commits to inform the populations, through communication with local authorities, about the activities that may potentially affect road safety and their duration, and to establish a grievance mechanism for the communities. GAC will ensure that the transport contractor and its insurance company quickly cover any costs associated with road accidents involving the proven liability of Project-related vehicles. In the mine area, GAC will prohibit non-authorized persons to access the construction and mine sites and Project haul roads and will layout alternative paths if necessary.

In addition, in the road area, GAC commits to maximize to the extent possible bauxite transport between 11pm and 6am when road traffic is lighter, and to implement a Traffic Management and Risk Assessment Plan establishing speed limits for different areas, setting rules for overtaking other vehicles, guidelines for driving in school areas, etc. Also, GAC will engage in discussions with local authorities through a Communication and Coordination Plan regarding potential road developments and improvements (speedbumps in sensitive areas, cutting off grass and vegetation encroaching on the road and reducing visibility, building fences around schools, etc.) and to coordinate transport activities taking into account the occurrence of important events that may affect the traffic.

6.3.2.3 *Presence of the Project workforce and transmissible diseases*

The presence of the Project workforce over the Project area (mine, road, and port) has been identified as a factor that may contribute to the general increase in disease transmission risk through interaction between the workforce and local populations, and to the increase in unsafe behaviors within local communities (drug use, prostitution).

In order to minimize these impacts, GAC commits to implement specific mitigation measures relative to Project workforce behavior on the one hand, and to raising awareness of local populations on the other. Specifically, GAC will develop and ensure the implementation of a Code of conduct for workers applicable to all Project staff, which will include instructions regarding use of alcohol and drugs, interaction with local communities and the prohibition to participate in illegal activities including the use of sex workers, commercial sex, and the use and smuggling of illegal substances. GAC will also develop an awareness raising program for local communities on hygiene, health, contagious diseases and available health infrastructure and services, and will also support the development of community development projects intended to improve public infrastructure and basic services. In addition, GAC will ensure that the local communities and authorities are informed about the grievance mechanism.

6.3.3 *Mobility and road transport*

The road transport of the bauxite ore will translate into an average of 50 truck passages and a maximum of 80 passages between 6pm and 7am daily. This is expected to generate a traffic increase of 15% compared to current levels around Kamsar and of 71% around Tanéné. During peak time, the traffic increase of heavy goods vehicle will be of 25% at Kamsar, 30% at Boké, and over 100% at Tanéné.

The traffic increase of heavy good vehicles along the national road will potentially generate traffic disruption due the presence of the trucks, their low speed movement, and their possible stops on the side of the road.

The road area is crossed by a network of weekly markets around which local communities organize their lives. During market days, traffic along the national road is more intense, even more so when the markets are installed on the sides of the road. In addition to these weekly markets, several market places along the road area are active 7 days a week where traffic and pedestrian presence are generally heavy. It should be noted that these commercial places have become an important factor contributing to economic and social development and dynamism in the area and to the increase in sub-regional interaction.

In order to reduce Project impacts on the mobility of road users, GAC commits to maximizing to the extent possible transport between 11pm and 6am when traffic is less intense. Authorized parking areas for the trucks will be determined in the *Global Road Traffic Management and Risk Evaluation Plan* in order to reduce the duration of stops and related disruptions of traffic and socioeconomic activities. GAC also considers establishing road improvements at the Kolaboui crossing (bus station) and at the Sahara market to better organize the coexistence of the different users. GAC will also make sure to coordinate bauxite transport activities with local authorities based on local events and external factors that may affect road traffic.

With respect to the potential degradation of the road infrastructure securing mobility and economic development, GAC commits to coordinate the implementation of a road maintenance and rehabilitation program with local authorities. This measure has already been taken into account in Project design in order to mitigate any road damage caused by Project activities. Nevertheless, in order to account for the usage of other heavy goods vehicles not related to the MBS Project and that could also impact road conditions, GAC will support local authorities in creating a specific framework for consultations between the regional players of the mining sector to consider their respective involvement in the development of different infrastructure Projects including for the road.

6.3.4 Access and use of natural resources and livelihoods

6.3.4.1 Mine area

Most lands that will be physically occupied by the Project in the mine area are bowals and grassland savannahs on the bauxite plateau. The wooded savannahs on the edges of the plateau and the slops' agricultural parcels and fallow areas (traditionally managed under a multiannual rotation of slash-and-burn agriculture and fallow) are not expected to be significantly disturbed. Based on the preliminary evaluation conducted in April 2016, the area presents a limited agricultural activity. However, given the strong dependence of households on agriculture for revenue generation and subsistence, the impact relative to the potential loss of agricultural land or the decrease of agricultural productivity cannot be ignored.

Should agricultural land be impacted, GAC will compensate the loss of land as part of GAC's *Resettlement and Livelihood Restauration Plan,* while prioritizing the replacement of land over financial compensation and making sure to involve in the process individuals holding firm rights over the impacted lands as well as those who only have simple customary rights. This would also allow ensuring that social dynamics around land management are maintained and that lineages are respected.

As for access and utilization of forest products such as heating wood, food, and medicinal plants, GAC will first identify the most strongly impacted users

of these resources in terms of revenue generation and will develop an appropriate livelihood restauration plan (traditional healers, carpenters, etc.). Finally, GAC is working on the establishment of local development projects, in particular to support economic diversity and alternative activities (e.g. crafts, small commerce, services, etc.), or to raise awareness of local communities regarding the efficient use of energy wood (substitution with other combustibles – waste, peat, dry cow dung, use of improved stoves, etc.).

6.3.4.2 Road area

GAC will ensure that any nuisance resulting from potential dust falls over agricultural produce and vegetation along the road will be minimized thanks to the use of tarpaulins to cover the ore-carrying trucks and by cleaning the trucks on their way out from the mine site.

On the other hand, the national road is located along an important axis of livestock transhumance between the country's inner lands and its coast. The probability to come across bovine herds near the road increases significantly from December to January and May to June when the transhumance occurs. Poultry farming and the breeding of small ruminants is also frequent in the area. Animals are left free during the day, including in the vicinity of the road. In the event of a collision between a Project vehicle and livestock or other farm animals, GAC will ensure the quick compensation of impacted individuals.

These impacts will be minimized through the implementation of the *Global Traffic Management and Risk Assessment Plan.* The plan will take the transhumance periods into account and identify road sections likely to be used by animal herds during the transhumance movements. The Plan will also consider stray poultry and small ruminants, in particular at dawn and nightfall when they are left free.

6.3.4.3 Port area

In the port area, the main economic activities that may potentially be impacted by Project activities are artisanal and semi-industrial fishing. These activities provide revenues to fishermen (male) but also to a large number of women involved in the processing of fish catches (drying, smoking) and their sale.

In order to prevent potential interferences between Project activities (expected to be of low intensity) and fishermen, GAC commits to inform the fishermen in the area ahead of operations in order to limit Project impacts on the movement of fishermen in the estuary. In addition, GAC will collaborate with the Port Authorities to establish a plan for the movement of the boats involved in construction activities and dredging in the estuary, which will be shared locally with authorities and affected populations.

6.3.5 Presence of the Project workforce and potential in-migration

As discussed in Section *5* of this Non-Technical Summary, the Project is expected to employ a limited number of workers given the reduced scale of the Project's activities. Nevertheless, the possibility of a migrant influx in search of employment in the mine and port areas cannot be excluded. In-migration management may therefore turn out to be necessary, and has been taken into account as part of GAC's main bauxite export project.

The possible arrival of migrants looking for jobs will have impacts on the demography and social dynamics of the areas in question, as well as on access to infrastructure and basic services, and on the health and safety of local populations.

Potential impacts linked to the influx of potential migrants in the Project areas will be minimized through the development and implementation of an in-migration Management Plan in coordination with regional and local authorities. The plan will consist in, among other things, a better distribution of economic opportunities across several localities, and an improvement of health and sanitary infrastructure in the affected localities. GAC will also support the financing of community development projects aimed at improving public infrastructures and basic services in the areas experiencing an influx of migrants. What is more, the Project will implement a recruitment policy favoring local citizens to the extent possible in order to benefit local communities as a priority and to discourage excessive in-migration.

As for the Project workforce, GAC will enforce its Code of Professional Ethics, in particular the measures relative to the use of drugs and alcohol, interaction with local communities, and the prohibition to engage in any illegal activity including the use of sex workers and the use and/or trafficking of illegal substances.

Finally, the presence of the workforce and migrants will increase the demand in various sectors of the economy (housing, transport, food, small trades, private health and education services, crafts, etc.), which will create economic opportunities for local populations and therefore contribute to the economic dynamism and revenue increase for households in the Project areas. In order to promote these positive impacts on the local economy, GAC will develop programs aimed at strengthening the capacities of local enterprises to help them comply with the quality requirements of the Project and the health and safety standards established in the Mining Code of 2013 (article 30-II). This will also allow anticipating the vocational conversion for short-term employees (provision of vocational trainings, job search trainings etc.). On the other hand, the identification of authorized parking areas along the road as part of the *Global Traffic Management and Risk Assessment Plan* will focus the positive economic impacts associated with the consumption of truck drivers to some predefined areas.

6.3.6 Cultural heritage

Based on the results of the cultural heritage study conducted as part of GAC's main bauxite export project, out of the cultural heritage sites identified in the mine north of Plateau 20, only two sites may potentially be impacted by Project activities. These two sites were identified as "genie dwellings" which local authorities have considered to be "reproducible".

In addition, three "genie dwellings" have been identified along the road as well as seven cemeteries and burial grounds in the vicinity of the road study area. Several Muslim places of worship were also identified along the road, some of them welcoming a large number of followers from neighboring villages for the Friday prayer.

At Kamsar, there were no cultural heritage sites identified in the study area or its vicinity, and therefore no subsequent evaluation has been carried out. The cultural heritage site closest to the study area is a "genie dwelling" located in the locality of Kassoussou over 2 km south of the KCT.

Generally, the same mitigation measures identified as part of the SEIA Addendum relative to cultural heritage impacts will be applied to the MBS Project. In particular, GAC will develop a Cultural Heritage Management Plan including information regarding the processes, procedures, and resources that the Project will use to manage the cultural heritage sites in the mine area. These measures will integrate avoidance measures into the detailed Project design. During construction and clearance in the mine area, a "chance finds" procedure will allow the identification and, if necessary the protection or rescue, of potential underground discoveries.

As for the road, GAC will focus transport activities during nighttime, between 11 pm and 6 am when mosque attendance is the lowest. GAC will also establish a communication and coordination plan with local and traditional authorities in order to inform about potential changes to the hours and intensity of truck movements, while taking into account religious celebrations and other important sociocultural events

The closure phase corresponds to the end of mining operations on the bauxite plateaus. However, in the case of MBS, mining activities on Plateau 20 will be expanded and overtaken as part of GAC´s main bauxite export project (unless the commercial objectives of the MBS initiative are met before the expected start date of GAC´s main project, in which case the mine closure and rehabilitation of Plateau 20 for the MBS Project will be carried out gradually and in accordance with the Mine Closure and Rehabilitation Plan established for the main project).

The progressive pit closure and rehabilitation will include re-contouring and re-grading the pit surfaces followed by surface spreading of topsoil. The mined areas will then be re-vegetated and the land will be prepared for future use according to the Mine Closure Plan (natural area, pasture, agricultural area, residential area).

The land occupied by the mine and its infrastructure will be returned to its former state and land use as far as reasonably possible. This will be done through consultations with local authorities and communities to ensure that the land use objectives are consistent with the socio-economic development objectives of the area.

Closure planning will be a dynamic process requiring regular review during mine life to take into account changes in Project configuration, economic conditions, legal obligations, corporate requirements, community expectations and technical knowledge. The Plan will be developed conceptually prior to start of operations, and reviewed and updated regularly during operations.

Rehabilitated areas will be subject to regular environmental monitoring to verify that rehabilitation objectives are being met, and define corrective actions if not.

Along the national road, the end of the Project´s activities will translate into a decrease in the intensity of traffic on the road, especially at night. Any degradation of the road associated with the Project activity will be rehabilitated by GAC, in consultation with the authorities responsible for the maintenance of the road.

At the KCT, the end of the MBS Project activities will translate in a decrease in the usage of the KCT and the end of barge loading activities at the quay. The infrastructure at KCT will continue to be used however in the context of the construction and operation phases of GAC´s bauxite export project.

GAC has identified and committed itself to a large number of social and environmental measures designed to mitigate adverse impacts and ensure benefits are delivered. All mitigation measures specified in the SEIA are compiled, updated and translated into the Social and Environmental Management Plan (SEMP) for implementation of GAC's Market Bauxite Sample Project.

The objective of the SEMP is to lists and summarized all mitigation measures and social and environmental plans and procedures to be implemented by the Project and to provide a framework for monitoring or even auditing project compliance with these standards and good practices.

The SEMP is organized by topic and defines a clear statement of the actions that will be taken for each Project component (mine, road, and port). It also includes commitments to undertake further studies in order to refine mitigation and monitoring plans and establish contingency arrangements should monitoring reveal that impacts are more significant than expected.

Surveillance and monitoring of the Project's social and environmental impacts are key aspects of an effective social and environmental management system. Any modifications to the measures in place will be based on social and environmental quantitative thresholds or on qualitative criteria as defined in the Social and Environmental Monitoring Plan.