Laúca Hydropower Project
Environmental and Social Due Diligence
Final Report

Report Prepared for
Deutsche Bank AG

Report Number 479059/2

Report Prepared by
srk consulting
October 2014
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Final Report

Deutsche Bank AG

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Executive Summary

Introduction

Deutsche Bank AG (“Deutsche Bank”) has been mandated by the Ministry of Finance of Angola to arrange the partial funding of the Laúca Hydropower Project on the Kwanza River (the “Project”); to be executed by a consortium comprising Construtora Norberto Odebrecht, S.A. Sucursal em Angola and Odebrecht Angola Construção e Projectos de Energia Ltda. (collectively “Odebrecht”) appointed by the Kwanza Environmental Development Office (GAMEK).

The scope of the project includes the supply and installation of electromechanical equipment for the Project and will comprise facilities to be insured by export credit agencies (“ECAs”) OeKB and Euler Hermes – with regards to supplies and services by a consortium formed by Andritz Hydro GmbH of Germany and Andritz Hydro GmbH of Austria – and possibly also Cesce, as well as MIGA (the “Lender Group”). Additional banks may be invited by Deutsche Bank to provide additional finance. The financial close is envisaged to be in November 2014.

SRK Consulting (South Africa) (Pty) Ltd (“SRK”) was appointed as the Independent Environmental and Social Consultant (the “Environmental Consultant”) to provide an Environmental and Social Due Diligence (ESDD) to support the proposed financing. Compliance was assessed in terms of the International Finance Corporation (IFC) Performance Standards (PS) (2012), World Bank (WB) Safeguard Policy (SP) Safety of Dams (OP 4.37, 2001), Core Values and Strategic Priorities of the World Commission on Dams (WCD) (2000), the Equator Principles (EP) and Angolan legislation.

Governance Framework for the Project

Angolan Legal Requirements

The most critical Angolan legislative requirement pertaining to certain proposed projects is that a comprehensive Environmental Impact Assessment (EIA) process for the project is undertaken. Typically this requires the compilation of an Environmental Impact Statement (EIS) to support the proposed financing. Compliance was assessed in terms of the International Finance Corporation (IFC) Performance Standards (PS) (2012), World Bank (WB) Safeguard Policy (SP) Safety of Dams (OP 4.37, 2001), Core Values and Strategic Priorities of the World Commission on Dams (WCD) (2000), the Equator Principles (EP) and Angolan legislation.

International Standards

The IFC PS's on Environmental and Social Sustainability are recognised as being the most comprehensive standards available to international finance institutions working within the private sector. The principles provide a framework for an accepted international approach to the management of social and environmental issues. The World Bank Environmental Health and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in IFC’s PS3 on Resource Efficiency and Pollution Prevention. The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC.

The WCD, a global multi-stakeholder body initiated by the World Bank and the World Conservation Union (IUCN), has established comprehensive guidelines for dam building that are intended to protect dam-affected people and the environment, and ensure that the benefits from dams are more equitably distributed.

The WB Operational Policies (OPs) have been identified by the WB as being particularly important in ensuring that Bank operations do no harm to people and the environment. There are 10 WB SPs, comprising the Bank’s policy on EIA and policies.
Project Background

The project entails the construction of a dam and associated installations for the Laúca hydropower facility with an installed capacity of 2 070 MW, generated by two powerhouses with capacities of 2 004 MW and 66 MW respectively (the latter powered by the minimum ecological flow of 60 m³/second). Laúca Dam will be 36 km long and 15 km wide and cover an area of 188 km². The roller-compacted concrete dam wall will be 132 m high with a crest extension of approximately 1 075 m.

The Power Generation Circuit encompasses the following main hydraulic structures:

- Adduction channel, integrated into the reservoir and allowing for adequate flow to the intake;
- Six gravity water intakes;
- Six ~ 2000 m long adduction tunnels to the underground power house equipped with six turbine sets of 334 MW each; and
- Six evacuation tunnels with gate structures.

The energy output will be distributed into the Angolan Electricity Transmission System via a new 400 kV substation.

The estimated workforce will comprise approximately 5 800 personnel at peak construction in Q3 2015; more than 90% of workers will be Angolan nationals.

The Laúca Hydropower Project is scheduled to be commissioned in September 2017 and will be executed in three phases:

- **Phase 1** consists of the construction of two river diversion tunnels, addressed in a separate Environmental and Social Impact Assessment (ESIA) submitted to MinAmb in January 2013. This work is effectively completed. Clearing of unexploded ordinance (land mines) over an area of 1.4 million m² at the construction site was completed during this phase.

- **Phase 2** encompasses the civil works for the construction of the dam wall, water intake structures and excavations for the underground adduction tunnels and powerhouse. This phase commenced in Q3 2013.

- **Phase 3** encompasses the procurement, installation and commissioning of the power generation equipment, which will be supplied by Andritz and Bardella. This phase commenced in Q4 2013.

Environmental and Social Setting

The Laúca Hydropower Project is located on the border of the North Kwanza, South Kwanza and Malanje provinces on the middle stretch of the Kwanza River, 47 km downstream of the Capanda hydroelectric scheme, 75 km east of the city of Dondo and 220 km south-east of Luanda. Three villages located south of the Kwanza River (Kissaquina South, Bangwangwa and Ginguri) with a combined population of approximately 254 will be resettled as a result of the project. Eleven villages with a combined population of approximately 800 are located north of the Kwanza River in the Area Directly Influenced by the project; these villages will not be resettled. Most villages are without educational and health care facilities and without basic infrastructure such as water supply, waste and sewage systems. Villagers collect water from small rivers in the rainy season and small impoundments along dry river beds in the dry season. Due to its distance from local communities, the Kwanza River is used only for fishing. Key economic sectors in the area include subsistence

\[1\] Note that transmission lines are excluded from the scope of the ESDD.
agriculture, animal husbandry, hunting, fishing, charcoal production and some trade. Malaria and waterborne diseases and infections are common in the area.

The area is dominated by fluvial erosive processes creating formations such as ridges, hills and mountains. The catchment of the mid-Kwanza is one of the four sub-basins in the Kwanza River catchment. In some sections the mid-Kwanza River drops sharply in elevation through a series of rapids and waterfalls (cascades). The long-term mean annual flow recorded at Laúca between 1952 and 1982 is 684 m³/s with the maximum flow occurring between March and April. Water quality in the Kwanza River at Laúca is generally good: the water is clear (limited sediment), slightly alkaline with low conductivity, limited dissolved solids and few nutrients and pollutants. The physical and chemical characteristics of water in the Kwanza River at Laúca are influenced by the Capanda hydropower facility.

The vegetation of Laúca comprises dry savanna with fairly dispersed shrubs and trees, forest areas composed of dominant trees and some shrubs, riparian forests along the river characterised by large trees, shrubs, palms and vines extending over the canopy (including a number of edible varieties), and communities of aquatic plants directly dependent on the river. A number of plants are used by local communities for clothing, food, fuel and medicinal purposes.

The Laúca region has a considerable diversity of fauna. High diversity of fish species was identified in the area although there is a general lack of knowledge with regards to the biodiversity of the Kwanza River basin. One bird species identified in the area is on the IUCN’s Red List – the Red-crested turaco (*Tauraco erythrolophus*). No rare or threatened mammal species were observed.

**Status of Compliance**

**Host Country**

An ESIA for the Laúca Hydropower Project was prepared by Holísticos and Intertechne to Angolan environmental regulatory requirements in 2013\(^2\). An Environmental License was granted in June 2014. The license contains a number of conditions, including those listed in a prior MinAmb Technical Report, requesting an Addendum to the ESIA addressing changes to the Project as well as a number of additional information requirements and recommendations.

**IFC Performance Standards**

Key deficiencies in respect of the IFC PS’s include the following:

- The ESIA complies with IFC PS’s in many respects. However, ecosystem services, emissions of greenhouse gases, land capability of the inundated area and associated opportunities are neither described nor assessed in the ESIA. Cumulative impacts are also not assessed and PS1 is clear that the project should consider cumulative impacts; however a Cumulative Impact Assessment (CIA) is currently underway, evaluating cumulative impacts of existing and planned projects on the Kwanza River from upstream of the Capanda Reservoir to the mouth of the river.

- Grievance mechanisms need to be formalised and disclosed to communities. A Social Communication Plan for Communities is in draft.

- The Project will result in the physical and economic displacement and a Resettlement Action Plan (RAP) is required. Consultants have been appointed to prepare a RAP. The capacity and experience of the consultant appointed for this critical task is not clear. Furthermore, the original limited implementation timeframe, given the difficulties in accessing the communities, is a potential concern.

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\(^2\) A separate Kwanza River Diversion ESIA, dated January 2013, was compiled and submitted to MinAmb in April 2013. This ESIA was not reviewed by SRK.
• GAMEK’s (or their successor's) capacity is difficult to gauge and a programme to build capacity and systems is recommended.

• Baseline biodiversity studies were undertaken during the ESIA and further biodiversity monitoring has and will occur. A BAP has not been developed and is recommended to comply with GIIP.

• No heritage study was conducted for the ESIA. The Angolan Ministry of Culture is responsible for the identification and protection of cultural heritage and identified cultural resources during two site visits. Limited capacity at government agencies is a minor concern in this regard.

**Equator Principles**

Notable deficiencies (excluding any listed under the IFC PS’s) include the following:

• Labour and workplace health and safety impacts are only marginally assessed in the ESIA, though it is evident that Odebrecht has the skills and capacity to ensure sustainable environmental, social, and health and safety (ESHS) management during construction.

• There is no system or audit trail which demonstrates that the WB EHS guidelines have systematically been incorporated into Odebrecht’s management system.

• Stakeholder engagement during the ESIA may have satisfied Angolan requirements, but is considered deficient in terms of GIIP. Odebrecht has, however, undertaken subsequent rounds of consultation with communities and drafted a comprehensive Social Communication Plan for Communities.

• The ESIA undertaken by Holisticos in partnership with Intertechne (who are also appointed to design elements of the dam, raising perceptions of compromised independence) was not independently reviewed.

**World Commission on Dams and World Bank Safeguard Policy for Dams**

Notable deficiencies in respect of WCD Strategic Priorities Review and World Bank Safeguard Policy for Dams review requirements include the following:

• Cumulative basin-wide impacts are not considered; a separate CIA is, however, underway.

• There is no documentation pertaining to negotiations on mitigation and benefit sharing mechanisms.

• The ERP does not address dam failure at present. Ongoing external quality control is provided by a consortium of Coba and Lahmeyer International who are also present on-site. Lenders have appointed Stucky to undertake an independent dam design and safety review, which indicates possible technical concerns regarding generators, surge tanks and headrace tunnels; these are being discussed with Odebrecht and GAMEK. The report will also determine the flood wave and physical extent of catastrophic flooding in the event of dam failure.

**WB EHS Guidelines**

There is no system or audit trail which demonstrates that the WB EHS guidelines have systematically been incorporated into Odebrecht’s management system and procedures.

**Review Conclusions**

This review has shown that the Laúca Hydropower Project complies with host country legislation, but that additional work is required to meet international standards. Several gaps have been addressed since release of the Draft ESDD; as such the Final ESDD reports fewer gaps and the ESAP (provided in Appendix C of the ESDD Report) is appropriately trimmed. Virtually none of the gaps
and deficiencies is considered material, and can be addressed in the short to medium term and incorporated in conditions and covenants attached to loans.

The key risks for the project which need to be addressed include the following:

- Resettlement action planning;
- GAMEK (or their successor’s) capacity;
- Dam safety (review); and
- Biodiversity.

Less critical risks, relate to:

- Assessment of environmental impacts and perceptions of compromised independence;
- Grievance mechanisms; and
- Emergency response.

An Environmental and Social Action Plan (ESAP) sets out specific requirements for addressing each risk and gap.

SRK recommends that annual or bi-annual verification of the implementation of the EP and PS be undertaken by qualified and experienced independent environment and social experts.
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Acronyms and Abbreviations

ESHS  Environmental, Social, Health and Safety
EP    Equator Principles
ESDD  Environmental and Social Due Diligence
IFC   International Finance Corporation
EIS   Environmental Impact Statement
EMP   Environmental Management Plan
ENE   Empresa Nacional de Electricidade
ERP   Emergency Response Plan
ESIA  Environmental and Social Impact Assessment
ESMS  Environmental and Social Management System
GAMEK Gabinete de Aproveitamento do Médio Kwanza (Kwanza Environmental Development Office)
GIIP  Good International Industry Practice
ISO   International Organisation for Standardization
IUCN  International Union for Conservation of Nature
kV    Kilovolts
MIGA  Multilateral Investment Guarantee Agency
MinAmb Ministério do Ambiente (Ministry of Environment)
MinEA Ministry of Energy and Water Resources
MinPescas Ministry of Fisheries
MW    Megawatt
OECD  Organization for Economic Cooperation and Development
PS    Performance Standard
WB    World Bank
WB SP World Bank Safeguard Policies
WCD   World Commission on Dams
WCD SP World Commission on Dams Strategic Priorities
Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK Consulting (South Africa) (Pty) Ltd ("SRK") by Deutsche Bank AG ("Deutsche Bank") and Odebrecht. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this Report apply to the site conditions and features as they existed at the time of SRK’s investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.
1 Introduction and Scope of Work

Deutsche Bank AG (“Deutsche Bank”) has been mandated by the Ministry of Finance of Angola to arrange the partial funding of the Laúca Hydropower Project on the Kwanza River (the “Project”); to be executed by a consortium comprising Construtora Norberto Odebrecht, S.A. Sucursal em Angola and Odebrecht Angola Construção e Projectos de Energia Lda. (collectively “Odebrecht”) appointed by the Kwanza Environmental Development Office (GAMEK).

The scope of the project includes the supply and installation of electromechanical equipment for the Project and will comprise facilities to be insured by export credit agencies (“ECAs”) OeKB and Euler Hermes – with regards to supplies and services by a consortium formed by Andritz Hydro GmbH of Germany and Andritz Hydro GmbH of Austria – and possibly also Cesce, as well as MIGA (the “Lender Group”). Additional banks may be invited by Deutsche Bank to provide additional finance. The financial close is envisaged to be in November 2014.

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Note that transmission is excluded from the scope of the ESDD.

1.1 Objectives

The two main objectives of the ESDD are to:

- Summarise the relevant characteristics of the Project related to environmental, social, and health and safety\(^2\) (ESHS) aspects based upon a review of existing information, including the Project Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plans (ESMP) and related documents; and

- Evaluate the adequacy of the proposed Project’s ESHS assessments, plans and procedures and present conclusions and recommendations associated with identified deficiencies or issues.

1.2 Scope of Work

SRK’s Scope of Work (SoW) involved the following tasks:

- **Task 1: Project scoping, review and appraisal of ESIA / ESMP related documents:**
  - Review all relevant ESHS Project documents and information;
  - Review the status, quality and robustness of the construction consortium’s (hereafter Odebrecht) Environmental and Social Management System (ESMS); and
  - Prepare a preliminary “Gap Analysis” to identify any material gaps between the existing Project ESIA/ESMP related documents and the Lender Group standards.

- **Task 2: Construction site audit at Laúca Dam site and Odebrecht’s premises:**
  - Visit the construction site, adjacent areas potentially affected by the project and areas to be inundated by the dam;

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\(^2\) Safety is assumed to include security aspects too.
o Verify adherence to the applicable ESMS, plans and procedures for construction, with digital photo-documentation of observations;

o Meet / discuss potential issues with contractors and environmental inspectors;

o Discuss potential issues with local residents, civil authorities and local Non-governmental Organisations (NGOs) (if applicable);

o Prepare a summary on the principal findings regarding the Project's ESHS and labour performance, and recommendations to correct deficiencies; and

o Respond to matters raised by any party of the Lender Group, whether relating to the ESSD reports or otherwise.

- **Task 3: Disclosure:**

  o Assist parties of the Lender Group that have requirements / policies for disclosure of documents and public consultation;

  o Track comments received during the disclosure period; and

  o Assist with responses, summary reports, etc.

- **Task 4: Environmental and Social covenants in financial documentation:**

  o Assist (as requested) with the negotiation of ESHS requirements of the financial documents (i.e. loan agreements, common terms agreements, etc);

  o Include items such as monitoring provision, change management, assessment of non-compliances, implementation of Environmental and Social Action Plan (ESAP) etc.; and

  o Attend meetings and conference calls, as needed by the Lender Group.

- **Task 5: Reporting:**

  o Compile a Draft ESDD Report (incorporating a Draft ESAP) presenting the results and conclusions of the detailed review of all relevant documents and the site visit and an appraisal of their adequacy and project compliance with the Lender Group standards; and

  o Compile a Final ESDD Report and ESAP taking into account all comments received from the client.
2 Review Process and Method

2.1 Desktop Review of Documentation

Available relevant documentation and data was reviewed by SRK prior to the site visit. This included the ESIA and ESMP, and subsequent studies and components of Odebrecht’s ESMS (referred to by Odebrecht as the Integrated Sustainability Programme). All standards pertinent to the review were analysed including national regulatory requirements.

The key documentation reviewed included:

- **ESIA**: An ESIA was prepared by Angolan consultants Holísticos, Lda. (Holísticos) in partnership with Brazilian consultants Intertechne Consultores S.A. (Intertechne) in order to fulfil Angolan regulatory requirements. The ESIA makes reference to international standards, including the WB Guidelines, IFC PS’s and EP (deemed optional). The ESIA is dated May 2013 and was released prior to public hearings conducted by MinAmb in April 2014, as prescribed by Angolan legislation.

- **Sub Programs**: Environmental Management Programs (EMP) developed by Holísticos and Intertechne, which comprise Chapter 6 of the ESIA. The EMPs comprise several Programs as vehicles for implementation:
  
  o Social Communication Program;
  
  o Environmental Education Program; and
  
  o Programs for Support to the Works:
    
    - Construction Environment Program;
    - Slope Monitoring Program;
    - Community Resettlement Program;
    - Archaeology Heritage Protection Program;
    - Degraded Area Recovery Program;
    - Socio-Environmental Programs;
    - Community Support Program;
    - Monitoring and Control Programs;
    - Climate Monitoring Program;
    - Hydrogeological Monitoring Program;
    - Limnology, Water Quality and Sediment Modeling and Monitoring Program;
    - Ichthyofauna Inventory and Monitoring Program;
    - Flora Conservation Program;
    - Terrestrial Fauna Conservation Program; and
    - Vector Control Program.

  The programs are in effect management frameworks, not detailed plans or procedures.

- **Technical Report by MinAmb**: An Environmental License has not yet been issued for the Project. MinAmb issued a Technical Report on the ESIA on 28 January 2014, confirming general
compliance of the ESIA with Angolan legislation and international standards, on the assumption that a number of gaps identified in the Technical Report will be addressed.

- **Odebrecht ESMS documents**: A comprehensive suite of ESMS policies, plans and procedures have been developed by Odebrecht, relating mainly to the construction phase of the project. This includes an Emergency Response Plan (ERP). In addition, studies, reports and monitoring results compiled after the ESIA were provided for review.

A comprehensive list of documents reviewed is presented in **Appendix A**.

### 2.2 Gap Analysis

SRK considers this a critical element of the ESDD. A summary of Angolan regulatory environment and relevant policies and guidelines as well as international standards and benchmarks is presented in Section 5. Compliance with individual aspects of national and international requirements is summarised in Section 6.

### 2.3 Site Visit

A site visit was undertaken by SRK Principal Consultants Sharon Jones and Sue Reuther from 18 to 21 August 2014 to gain an appreciation of the project and its social and environmental contexts. The visit also provided an opportunity to assess the performance and compliance of the ESMS, plans and procedures and to assess labour performance, defined as those labour related issues covered in IFC PS2 – mainly around systems, employee grievances and fair treatment, equal opportunity and non-discrimination, child and forced labour.

During the course of the visit, the SRK team also engaged with the community in the zone of indirect influence of the Project (community representatives/leaders).

The main activities for each day of the site visit are summarised in Table 2-1 below.

**Table 2-1: Daily activities undertaken on the site visit on 18 – 21 August 2014**

<table>
<thead>
<tr>
<th>Day</th>
<th>Activities</th>
</tr>
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</table>
| Day 1   | • Welcome by Alice Ponciano, Environmental Officer.  
| Monday 18 Aug | • Travel to Laúca.  
|          | • Introduction to the project and management team by Miguel Figueiredo, Odebrecht Contract Director and Rafael Neto (GAMEK). 
|          | • Safety induction by Francisco Sawaguthi, Safety Manager. |
| Day 2   | • Site visit guided by Miguel Figueiredo and attended by members of the Safety Team (Manager Francisco Sawaguthi), Environmental Team (Manager Nelson Alves) and Social Team (Manager Esteves Mbela) to get a general overview of the site) and understand risks and impacts. Selected areas were visited, including:  
| Tuesday 19 Aug | o Elevated viewing platform providing a view of the diversion tunnel entrance and dam construction activities;  
|             | o Elevated viewing platform providing a view of the Laúca Rock and construction of the diversion tunnel exist, powerhouse and substation platform;  
|             | o Waste management area; and  
|             | o Induction and safety training centre.  
|             | • Discussions regarding the Integrated Sustainability Programme and regulatory requirements with the Environmental Team and Rafael Neto (GAMEK).  
|             | • Discussion of labour and working conditions with the Human Resources Team, |
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<table>
<thead>
<tr>
<th>Day</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day 3</td>
<td>• Visit to local communities, Ngola Ndala and Nyanga Ya Pepe, located near the site along the public road leading to Laúca, with Miguel Figueiredo and the social team to gauge villagers’ views on the Project, ascertain the extend and efficacy of engagement that has taken place, and to view the clinic and school upgraded by Odebrecht as part of their social programme.</td>
</tr>
<tr>
<td>Wednesday</td>
<td></td>
</tr>
<tr>
<td>20 Aug</td>
<td>• Discussion of social aspects, including stakeholder engagement, social initiatives, resettlement and heritage, with the Social Team.</td>
</tr>
<tr>
<td></td>
<td>• Discussion of safety aspects with Miguel Figueiredo and Francisco Sawaguthi.</td>
</tr>
<tr>
<td></td>
<td>• Discussion of biodiversity management and rehabilitation with the Environmental Team.</td>
</tr>
<tr>
<td>Day 4</td>
<td>• Close-out session providing feedback to the management team regarding the main findings of the audit.</td>
</tr>
<tr>
<td>Thursday</td>
<td></td>
</tr>
<tr>
<td>21 Aug</td>
<td></td>
</tr>
</tbody>
</table>

SRK was not able to visit Kissaquina South, which is to be resettled, as it takes 6 hours from Laúca to reach the village. Information on this community was obtained from field reports provided by Odebrecht (Diagnóstico visual das aldeias da área de influência directa: Processo de Auscultação das Comunidades. Visitas realizadas por Esteves Mbela do dia 20 – 25 de Maio de 2013).

2.4 Reporting and Discussion of Draft Findings

The Draft ESDD Report presented the results and conclusions of the detailed review of all ESIA/ESMP related documents, Odebrecht plans, procedures and documents made available for review and other documents listed in the SoW (see Section 1.2), and an appraisal of their adequacy and Project compliance with the Lender Group standards. The Draft Report was submitted to the Lender Group, for their review and comment. Comments were addressed and incorporated in the Final ESDD Report.

The Draft ESDD Report contained the following:

• Results and conclusions of the detailed review and expert evaluation of the ESHS aspects of the Project, based upon the review of existing information and the construction site audit;

• Statement on any significant deficiencies or issues related to the content and quality of Project related documents or Project-specific ESHS aspects, with clear statements on the Project’s level of compliance with host country and international standards;

• Conclusions and recommendations / proposed mitigation measures associated with any major deficiencies / issues identified in the Project; and

• A Draft ESAP with actions and timescales for achieving compliance.

2.5 Final Report

Following submission of the Draft ESDD Report, SRK revisited the site visit and attended a series of meetings between the Lenders Group, Odebrecht and MinAmb⁴, between 24 and 26 September 2014. The aim of the site visit and meetings was to discuss the findings and recommendations of the

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⁴ National Director of Prevention and Environmental Impacts Assessment, Ms Sandra Ferreira do Nacimento, and Environmental Officer, Ms Humbería Paixão
Draft ESDD and better understand the Project. In response to the findings of the Draft ESDD Report, Odebrecht submitted a number of revised and/or additional procedures and documents to SRK, aimed at addressing some of the gaps identified by SRK. These documents are indicated in italics in Appendix A.

The Final ESDD presents the revised findings of the review, taking into account discussions with the Lender Group and amendments to project plans and specifications. The Final ESDD is very similarly structured to the Draft ESDD, but takes account of gaps which have been closed since release of the Draft ESDD. As such it reports fewer gaps and the ESAP is consequently appropriately trimmed.

It is anticipated that the Final ESDD will be disclosed by the Lender Group, along with the Final ESIA.
3 Project Background

This section briefly describes the Project and is based on the information provided in the ESIA, on site observations and interviews with Odebrecht and GAMEK personnel.

3.1 Project Overview

The Laúca Hydropower Project is located at Km 307.5 of the Kwanza River on the border of the North Kwanza, South Kwanza and Malanje Provinces on the middle stretch of the Kwanza River, 47 km downstream of the Capanda Hydropower Scheme (reservoir) and approximately 100 km upstream of the Cambambe Hydropower Scheme (dam).

The project entails the construction of a dam and associated installations for the Laúca hydropower facility with an installed capacity of 2 070 MW, generated by two powerhouses with capacities of 2 004 MW and 66 MW respectively (the latter powered by the minimum ecological flow of 60 m³/second). Laúca Dam will be 36 km long and 15 km wide and cover an area of 188 km². The roller-compacted concrete dam wall will be 132 m high with a crest extension of approximately 1 075 m.

The power generation circuit will encompass the following main hydraulic structures:

- Adduction channel, integrated into the reservoir and allowing for adequate flow to the intake;
- Six gravity water intakes;
- Six ~ 2 000 m long adduction tunnels to the underground power house equipped with six turbine sets of 334 MW each; and
- Six evacuation tunnels with gate structures.

The energy output will be distributed into the Angolan Electricity Transmission System via a new 400 kV substation⁵.

The estimated workforce will comprise approximately 5 800 personnel at peak construction in Q3 2015; more than 90% of workers will be Angolan nationals.

The site comprises a number of facilities, including accommodation and associated facilities, concrete batch plant, crusher, waste management area, water treatment plant, effluent treatment plant, rock and waste rock storage and a clay mine. Two quarries listed and assessed in the ESIA have not yet been commissioned as excavated rock material is used instead.

On-site solid waste facilities include a waste sorting and storage area, hazardous waste incinerator, composting area, contaminated soil remediation area and a landfill. A range of materials are recycled by various Angolan companies. Also see selected site photographs in Appendix B.

3.2 Programme and Current Status

The Laúca Hydropower Project is scheduled to be commissioned in September 2017 and will be executed in three phases:

- **Phase 1** consists of the construction of two river diversion tunnels, addressed in a separate ESIA submitted to MinAmb in January 2013. This work is effectively completed: the tunnels were opened in September 2014 to divert the Kwanza River away from the dam wall construction site. Clearing of unexploded ordinance (land mines) over an area of 1.4 million m² at the construction site was completed during this phase.

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⁵ Note that transmission lines are excluded from the scope of the ESDD.
- **Phase 2** encompasses the civil works for the construction of the dam wall, water intake structures and excavations for the underground adduction tunnels and powerhouse. This phase commenced in Q3 2013.

- **Phase 3** encompasses the procurement, installation and commissioning of the power generation equipment, which will be supplied by Andritz and Bardella. This phase commenced in Q4 2013.

In mid-2014 the Project employed some 2,400 workers, of which 90% were Angolan nationals. In addition there were a further 1,300 subcontractors on site. A significant number of workers are from the local area and Odebrecht helps these workers obtain official documentation once their residence in a local village has been confirmed with the local chief. All workers receive two days of induction and safety training, in addition to any specialised training. Odebrecht's *Program Acreditar* is designed to provide new workers with 180 hours of vocational training and skills development as well as training in domestic economy and general health aspects. Some 450 workers have completed the programme to date, with an intention to train a further 2,600 workers by 2016. Supplementary training in subjects such as English and Information Technology is offered to interested workers on request. Odebrecht also implements a Young Partners programme and currently trains 30 Angolan workers for leadership positions at the Lãuca site, with an intention to increase this to 100 workers by 2016.

Additional accommodation is being built on site, while other facilities such as the sewage treatment works and kitchen are already equipped to service the projected maximum workforce.

Odebrecht has established various income generating projects in the surrounding communities and procures some food and plants (for landscaping and rehabilitation) from surrounding communities. Other social initiatives include assisting the local government to upgrade public buildings (schools and clinics) and campaigns on health and environmental awareness in local villages (also see Section 6.2.4).

Project documentation has not considered closure of the site as, according to Odebrecht, the operating life is reported to be several decades.
4 Environmental and Social Setting of the Project

Based on a review of documentation and observations during the site visit, the setting of the Laúca area and surrounds displays the following environmental, socio-economic and cultural features:

4.1 Environmental

- **Climate:** The climate of the Middle Kwanza River Basin is classified as tropical with distinct wet (October to April) and dry (May to September) seasons. Average annual rainfall is approximately 1 200 mm. Laúca's mean annual temperature is between 21°C and 22°C. The data show little seasonal difference in mean temperatures. June – August are the coldest months, while December – March are the warmest months.

- **Geology:** The mid-Kwanza region is characterised by extensive continental faults including the Kwanza Horst, a linear latitudinal uplifting of the crystalline basement (300 km long and 20 – 50 km wide) separating two geological structures – the Maiombe Shield in the north-west and the Angola Shield in the south-west of Angola. A portion of the mid-Kwanza basin, located near Dondo, includes rock and crystalline formations of the Ancient Masse, characterised by a high degree of metamorphism. The rock types include gneisses, paragneisses, migmatites, mica schists and granitic-gneisses although there are rocky outcrops of non-metamorphased rocks. Between the Upper Dondo and Kwanza Rivers there is a significant channel of schistic rocks associated with sandstone, high in feldspar. The formation of the overlying sediments occurs first in narrow edges and later widens significantly becoming part of the Kwanza sedimentary basin where there are outcrops of deposits.

- **Topography:** The Middle Kwanza River hydrographic basin encompasses coastal and sub-coastal, sub-plateau and plateau areas. The gently rolling terrain gradually becomes hilly and steep. The Kwanza River valley has residual elevations up to 800 m, and inselbergs are common features. The Malanje Plateau north of the Kwanza River consists of gently or moderately rolling terrain at an altitude of 1 050 to 1 250 m.

- **Soils:** The three primary soil types within the river valley are lithosols associated with rocky outcrops, ferralitic tropical soils and the well-drained alluvial soils. The ferralitic soils are most common and are visible in well-defined layers in the steep slopes. It is a highly weathered and leached soil enriched with iron and aluminium.

- **Hydrology:** The 54 000 km² mid-Kwanza catchment is one of the four sub-basins in the larger Kwanza River catchment. Elevations range from 160 m to 1 000 m. In some sections the mid-Kwanza River drops sharply in elevation through a series of rapids and waterfalls (cascades). The long-term mean annual flow recorded at Laúca between 1952 and 1982 is 684 m³/s with the maximum flow occurring between March and April.

- **Water quality:** Water quality in the Kwanza River at Laúca is generally good: the water is clear (limited sediment), slightly alkaline with low conductivity, limited dissolved solids and few nutrients and pollutants. The water is well oxygenated, mainly because of the rapids which facilitate mixing and oxygenation. The physical and chemical characteristics of water in the Kwanza River at Laúca are influenced by the Capanda hydropower facility.

- **Flora:** The vegetation of Laúca comprises dry savanna with fairly dispersed shrubs and trees, forest areas composed of dominant trees and some shrubs, riparian forests along the river characterised by large trees, shrubs, palms and vines extending over the canopy (including a number of edible varieties), and communities of aquatic plants directly dependent on the river. Certain habitats are rich and diversified in botanical taxa. Although the ESIA does not highlight any International Union for Conservation of Nature (IUCN) Red List species, some are likely to
occur in, though not be endemic to, the Project area. A number of plants are used by local communities for clothing, food, fuel and medicinal purposes.

- **Fauna:** The Laúca region has a considerable diversity of fauna as it is located at the transition between the coastal dry savannas that extend into the hinterland, forest ecosystems typical of the Angolan escarpment and the Miombo forest biome that covers a large part of the Angolan plateau and is dominant in the area affected by the Project. The Kwanza River itself, often set deep between mighty cliffs, supports a range of lacustrine ecosystems that contribute to the species diversity of the area:
  - **Fish:** 42 species of fish were identified from the families: Mormyridae, Kneriidae, Cyprinidae, Alestidae, Hepsetidae, Amphiliidae, Claroteidae, Mochokidae, Schilbeidae, Claridae, Cichlidae, Mastacembelidae and Poeciliidae. The Cyprinidae and Cichlidae families display the greatest diversity and abundance. Undocumented endemic species may occur in the area, noting high species diversity in the area and the limited knowledge of the biodiversity of the Kwanza River basin.
  - **Herpetology:** Six amphibian and 11 reptile species were identified in the area, the latter including the Leopard tortoise (*Geochelone pardalis*), Black mamba (*Dendroaspis polylepis*), African rock python (*Python natalensis*), Tree agama (*Acanthrocercus atricollis*) and Nile crocodile (*Crocodylus niloticus*). None of the recorded species is listed as Endangered.
  - **Birds:** 92 avian species, belonging to 43 families and 17 orders, were identified in the area, including eight species of predatory birds. The identified species correspond to approximately 10% of the known species in Angola. All identified species are common to Angola and Laúca. The White-head vulture (*Trigonoceps occipitalis*) is classified as Vulnerable on the IUCN Red List, while the Red-crested turaco (*Tauraco erythrolophus*) and the Red-backed mousebird (*Colius castanotus*) are endemic to Angola, albeit not of particular conservation concern.
  - **Mammals:** Mammals potentially occurring in the study area encompass 40 species belonging to 24 families from the following eight orders: Chiroptera, Rodentia, Primates, Soricomorpha, Macroscelidea, Tubulidentata, Hyracoidea and Artiodactyla. Mammals sighted during surveys conducted for the ESIA include rats, bats, genets, monkeys and warthogs.

### 4.2 Social

- The study area is situated at the border of three Provinces – South Kwanza Province, North Kwanza Province and Malanje Province.
- The Area Directly Affected by the project includes the villages of Kissauquina South, Bangwangwa and Ginguri south of the Kwanza River. Kissuaquina South is a satellite village of Kissauquina, which is located north of the Kwanza River. Kissuaquina South will be inundated by the dam and 58 people need to be resettled. One farm in Kissuaquina South will be inundated.

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6 Terminology is based on Angolan ESIA regulations:
- **Area Directly Affected (ADA)** – the area that is directly exposed to project facilities (i.e. project footprint) – this includes villages south of the Kwanza River that are located within the inundation area and will be resettled;
- **Area of Direct Influence (ADI)** – the area affected by the project’s direct impacts, i.e. impacts that result from the direct interaction between routine project activities and the receiving environment – this would include villages north of the Kwanza River that are affected by e.g. traffic, and will not be resettled; and
- **Area of Indirect Influence (AII)** – the area affected by the project’s indirect impacts and/or impacts resulting from unforeseen (accidental) project activities.
Bangwangwa (57 people) and Ginguri (139 people) will be located close to the future reservoir and are at increased risk of flooding during high rainfall events, and Odebrecht believes it will be prudent to resettle these villages. Resettlement will affect a total of 254 people from 60 families. All villages are very remote and lack basic services.

- The Area Directly Influenced by the project includes 11 villages:
  - Three villages in the São Pedro da Kilemba District / Cambambe Municipality in Kwanza Norte: Dumbo Ya Pepe, Nyanga Ya Pepe and Ngola Ndala; and
  - Eight villages in the Pungo Andongo District / Cacuso Municipality in Malanje Province: Kibenda, Quirinje, Cassula, Muta, Kiangulungo, Kissaquina Norte, Dala Kiosa - Dombo and Nyang Ya Culo.

The 11 villages have an estimated combined population of approximately 800. The population per village is significantly lower than in other regions of Angola, and only three villages (Dala Kiosa, Nyanga Ya Pepe and Ngola Ndala) have more than 100 inhabitants. None of these villages is affected by resettlement.

- Villages are headed by traditional authorities (mayors and sobas (chiefs)) in addition to informal leaders.

- Municipalities provide only rudimentary services, such as health and education facilities and administrative and notarial services, in larger settlements in the region and some of the villages.

- Living conditions in villages are very poor and marked by a lack of basic infrastructure (water supply, sewage system and electricity) and transportation services. Many inhabitants do not have identification documents.

- Water is collected from small rivers in the rainy season and small impoundments along dry river beds (cacimbas) in the dry season. Water quality is often poor, primarily during the dry season. Due to their distance from local communities, the Kwanza and Teteje Rivers are used only for fishing.

- Healthcare facilities are scarce and inadequate. The most common diseases are malaria, diarrhoea, respiratory illnesses and worm infections. Sleeping sickness and other maladies are also of concern. The use of medicinal plants is widespread in the villages. There is a clinic in Ndala Ngola.

- Educational facilities are inadequate. Teaching only takes place in three of the 10 villages (Nyanga Ya Pepe, Kissaquina and Dala Kiosa), and only up to Grades 3 or 4. Those wishing to continue their studies must move to Dondo or Cacuso.

- Dwellings are of traditional design and largely constructed from materials obtained from the surrounding environment, including mud and kakondo grass which are utilised to manufacture bricks, teté grass used in walls erected in wattle and daub dwellings and kapuia grass for roofing. Most households do not have latrines.

- Waste is disposed of in surrounding areas and, once accumulated, burned. In some cases, waste is buried in holes excavated for soil to produce adobe bricks.

- Villagers practise subsistence farming using rudimentary, unproductive farming methods. Main crops including manioc (i.e. cassava, the staple food item in the region), corn, sweet potatoes, squash, cowpeas and okra. Small subsistence plots are located at outside villages to prevent incursions by free-range goats raised in the local communities. Slash and burn techniques are widely used to prepare crop fields. Households also raise goats, pigs and poultry.
• Farming is supplemented by hunting and fishing, which are exclusively male activities. Due to the distance to the river(s), men spend several days fishing and return with dried fish.

• Surplus crops, local refreshments made from the fruit of the baobab tree and charcoal are sold on the side of the road or, when transportation is available, at the markets in Dondo or Cacuso. Households use the income to purchase salt, sugar, clothing, school and cleaning supplies.

• Villagers have shared cultural practices, includes the annual cleaning of the soba cemetery, which is considered a sacred site. The soba cemetery of Kissaquina South on the left bank of the Kwanza River will be inundated by the Laúca Dam. The Kirinji village soba cemetery (located on the right bank approximately 6 km form the Kwanza River) may be at risk of flooding.
5 Governance Framework

This section presents a summary of the governance framework relevant to the Laúca Hydropower Project. The framework is based on a review and summary of legislation and relevant international and other standards. Comment on the current status of compliance with the key elements of the governance framework is given in Section 0.

5.1 Angolan Laws and Regulations

The Republic of Angola is a unitary state based on the Constitution of 1975 (as amended, most recently in 2010), which provides the framework for the national administrative and organisational structure. Article 39 of the Constitution provides for the fundamental right of individuals to live in a healthy and non-polluted environment and establishes an obligation on the State to take the necessary actions to protect the environment and maintain the ecological balance.

Angolan law is enacted at the national level through different legislative instruments. The most important of these are laws and decrees as described below:

- **Laws**: these are the main sources of primary legislation and are passed by the National Assembly. They tend to cover broad issues and provide the enabling framework for the competent authorities to issue more detailed implementing legislation, e.g. decrees. Laws issued at national level apply throughout Angola, with implementation, monitoring and enforcement carried out at both the national and provincial levels.

- **Decree-laws and Decrees**: these are passed by the Council of Ministries, while Regulations (Executive Decrees) and Dispatches are normally issued by a ministry. They provide a subordinate form of primary legislation and tend to cover more specific issues (and are analogous to regulations adopted in many other countries).

Several pieces of national law refer to pollution of the environment, environmental impact assessment (EIA) and the protection of the environment in general. Angolan regulations tend to be fairly broadly framed and do not provide detailed standards (e.g. air quality, noise levels etc.) against which compliance can be measured. In the absence of such standards the default is to international standards (e.g. WB, European Commission) and, sometimes, to regional standards (e.g. South African). A synopsis of the relevant legislative and administrative framework is provided further below.

5.1.1 Administrative Framework

The most pertinent national ministries are briefly discussed below.

5.1.1.1 Ministry of Finance

The Ministry of Finance is responsible for the administration of public funds, promotion and stimulation of economic activity in competitive market conditions and implementation of fiscal policies and remedial income and prices to promote equity in the distribution of national income. The Ministry of Finance has mandated Deutsche Bank to arrange the partial funding of the Laúca Hydropower Project.

5.1.1.2 Ministry of Environment

MinAmb is responsible for the development and coordination of the country’s environmental policy and the National Programme of Environmental Management. MinAmb is responsible for approving EIAs under Decree No. 51/04 on Environmental Impact Assessment and issuing Environmental Licenses in terms of Decree No. 59/07 on Environmental Licensing.
5.1.1.3 Ministry of Energy and Water

The Ministry of Energy and Water Resources (MinEA) monitors the execution of energy generation activities and the use of hydrological resources. MinEA is drafting new legislation to expedite unbundling and restructuring of the Angolan energy sector.

The National Electric Energy Department provides technical support for power generation and distribution plants by participating in the concession award process, preparing appropriate standards, regulations and technical specifications, conducting technical audits and issuing quality certificates.

The National Water Resources Department establishes guidelines for the preparation of plans for the integrated use of hydrological resources and hydrographic basins and coordinates the preparation of general proceedings for the use of hydrological resources.

Kwanza Environmental Development Office

The Kwanza Environmental Development Office (Gabinete de Aproveitamento do Médio Kwanza – GAMEK) is a component body of the Ministry of Energy and Water Resources and has administrative and financial independence. The nature and purpose of GAMEK, specified in its Statute (Estatuto Orgânico) approved by Joint Directive (Despacho Conjunto) No. 14/86, dated 17 March 1986, is to undertake studies, preparatory analyses and projects for national water resource use in the Middle Kwanza River Basin.

5.1.1.4 Ministry of Agriculture

The Ministry of Agriculture is responsible for defining and implementing national sectorial development policies and strategies for agricultural and agro-nutritional safety sectors, rural development and rural communities, with a view towards enabling sustainable development.

5.1.1.5 Ministry of Fisheries

The Ministry of Fisheries (MinPescas) is responsible for formulating, executing, supervising, and controlling the management of aquatic biologic resources and activities related to fisheries, aquaculture and salt in Angola. The Ministry has a series of central and provincial structures, including the National Fisheries Research Institute and the Institute for the Development of Artisanal Fishing and Aquaculture.

5.1.2 Legislative Framework

The most critical legislative requirement pertaining to certain proposed projects is that a comprehensive EIA process for the project is undertaken. Typically this requires the compilation of an Environmental Impact Statement (EIS), incorporating environmental management measures, which are subject to comprehensive review by the authorities.

Items of legislation, which regulate the way in which EIAs are undertaken, are discussed below:

- General Environmental Law No 5/98;
- Decree No. 51/04 on Environmental Impact Assessment;
- Decree No. 59/07 on Environmental Licensing;
- Joint Executive Decree No. 130/09 on Environmental Licensing;
- Executive Decree No. 87/12 on Public Consultation for Projects Subject to Environmental Impact Assessment; and
- Executive Decree No. 92/12 on the Terms of Reference for Environmental Impact Studies.
Additional legislation with relevance to the proposed Project includes:

- Presidential Decree No. 190/12 on Waste Management;
- Decree No. 1/10 on Environmental Audits;
- Decree No. 31/94 on the Establishment of the Principles to Promote Health, Safety and Workplace Conditions;
- Executive Decree No. 128/04 on Regulation on Safety and Health for Workplace Signalling;
- Presidential Decree No. 194/11 on Liability on Environmental Damage;
- Water Law No. 6/02;
- Presidential Decree No. 261/11 on Water Quality;
- Decree No. 40.040 on Protection of Terrestrial Fauna;
- Resolution No. 42/06 on the National Biodiversity Strategy and Action Plan (NBSAP);
- Territory and Urbanism System Law No. 3/04;
- Cultural Assets Law No. 14/05;
- Resolution No. 52/08 on the National Strategy for the Implementation of UN Convention on Climate Change and Kyoto Protocol;
- Land Law No. 9/04; and
- General Labour Law No. 2/00.

These are all briefly discussed below.

5.1.2.1 General Environmental Law No. 5/98

The General Environmental Law No. 5/98 (GEL, Lei de Bases do Ambiente) was promulgated in accordance with the Constitutional Law of the Republic of Angola. The purpose of the law is to provide the framework for environmental legislation and regulations; more specifically to “define the basic concepts and principles for the protection, preservation and conservation of the Environment, promotion of Quality of Life and the rational use of Natural Resources” (Article 1). The GEL incorporates international declarations which Angola has ratified (e.g. Agenda 21) and defines citizens’ rights and responsibilities. Further, the GEL introduces the concept of legal penalties for illegal activities that have caused damage to the environment.

Article 4 includes a number of principles guiding GEL, including a principle in respect of liability: “all persons or organisations which through their actions cause harm to the environment, or the degradation, destruction or depletion of national resources, shall be held liable for the same, and shall be required to repair such damage and/or pay compensation for the damage caused”.

Article 16 of GEL stipulates that an EIA, including public consultation (Articles 10 and 32), is mandatory for all undertakings which have an impact on the balance and wellbeing of the environment and society. Clause 2 of this Article states that more specific legislation on EIAs will be developed by the government. An example is Decree No. 51/04 on Environmental Impact Assessment.

An Environmental License is issued on the basis of the EIA and this license is required before any other license required by law will be granted (Article 17(2)).
5.1.2.2 Decree No. 51/04 on Environmental Impact Assessment

Decree No. 51/04 on Environmental Impact Assessment was established under the GEL in order to ensure better environmental protection from human activities likely to have an impact on the environment. It establishes a set of procedures to be followed when carrying out an EIA and compiling an EIS.

According to this Decree, an EIS should achieve the following objectives:

- Provide a description of the project;
- Report on the EIA; and
- Take into account all technological alternatives and the location of the project, bearing in mind the possibility of non-execution of the project.

Article 4 refers to a list of activities, annexed to the Act, that require an EIA. An Environmental License for the activities listed in this annex must be obtained before commencement. Other (unlisted) projects that may cause significant damage to the environment (as identified by MinAmb) may also be required to undergo an EIA and licensing process.

Article 7 prescribes the required content of the EIS, including a description of the ecological, biological and social environment, the identification of impacts, the ‘definition of mitigation measures’ and the requirement to draw up a monitoring programme.

Article 10 of the Decree also makes provision for public consultation to be organised by the licensing authority, but, other than specifying the release of a non-technical summary, does not specify the form of consultation. According to the Decree, the Environmental Licensing process is the responsibility of the “Minister responsible for the environment”, exercised jointly with the Minister responsible for the relevant sector of the project (Article 11).

5.1.2.3 Decree No. 59/07 on Environmental Licensing

Decree No. 59/07 on Environmental Licensing adopts provisions concerning requirements, criteria and administrative procedures related to Environmental Licenses.

In terms of Section 2, Article 10, any activity requiring an EIA must acquire an Environmental License. Environmental Licenses are “issued by the entity responsible for environmental policy” (assumed to be MinAmb).

Two types of Environmental Licenses are required for activities listed in terms of Decree No. 51/04 on Environmental Impact Assessment: a Site Environmental License is acquired first and is needed for the establishment (construction) of a listed activity; while an Operation Environmental License is issued once compliance with all the requirements of the EIA has been demonstrated. The issuing procedures and contents of both licenses are stipulated in the Decree.

5.1.2.4 Joint Executive Decree No. 130/09 on Environmental Licensing

Joint Executive Decree No. 130/09 on Environmental Licensing sets out License Fees payable by the proponent for an Environmental License and other administrative costs, based on the investment value of the project.

5.1.2.5 Executive Decree No. 87/12 on Public Consultation for Projects Subject to Environmental Impact Assessment

Executive Decree No. 87/12 defines and sets out the purpose of public consultation for projects that require EIA. While the need for public consultation following submission of the EIS to the relevant Ministry, before approval and issuing of an Environmental License, is prescribed in legislation prior to
the promulgation of Executive Decree No. 87/12, this Decree provides a more detailed and extensive explanation of the objectives of and requirements for public consultation.

The regulations include a list of definitions related to public consultation (Article 1), the objectives and purpose of public consultation (Article 2 and 3), as well as the composition of the committee to preside over public consultation and its role (Article 4 to 7). In Article 8, the requirements for information disclosure during public consultation are explained, including the role of the Non-Technical Summary. Administrative details, such as the timeframe within which consultation must take place (5 – 10 days) and compilation of a public consultation report, are also set out in the regulations.

5.1.2.6 Executive Decree No. 92/12 on the Terms of Reference for Environmental Impact Studies

Decree No. 92/12 sets out the terms of reference for the EIS and specifies its general content. This Decree establishes that the EIS must be compiled in terms of the legislation on EIA and should follow the guidelines contained in any relevant sector-specific standard terms of reference for EIS once promulgated.

The Decree includes three annexes providing guidance on the information to be presented to the Ministry. Annex I is an application form for the project proponent to indicate which Environmental License is being applied for and Annex II provides a form for the provision of simplified preliminary project information. Annex III outlines the required content and structure for the EIS, but does not provide details on the required content of each section.

5.1.2.7 Presidential Decree No. 190/12 on Waste Management

Presidential Decree No. 190/12 establishes the rules concerning waste generation and disposal; discharge to water and the atmosphere; collection, storage and transport of any wastes (excluding radioactive waste). These rules aim to prevent or minimise negative impacts on people’s health and the environment, without prejudice to the establishment or rules aiming to reduce, reuse, recycle, recover and dispose of waste. According to Article 2, this regulation applies to all activities that might generate wastes or are involved in waste management.

All private or public entities producing wastes should develop a Waste Management Plan. This plan is valid for four years.

5.1.2.8 Decree No. 1/10 on Environmental Audits

Article 2 defines an environmental audit as a systematic and documented procedure for the management and objective evaluation of the organization and operation in terms of environmental protection. It also describes the purpose of an audit.

The Decree affirms that audited entities have to collaborate with the auditors, making available all documentation required to facilitate the audit by giving access to all the operations and facilities, reports on consumption of water, energy and machinery and to the personnel located on site (Article 11).

The Decree also establishes that the performance of the environmental audit does not exempt the audited entities from liability for environmental damage caused by activities that cause pollution or environmental degradation (Article 17).
5.1.2.9 Decree No. 31/94 for the Establishment of the Principles to Promote Health, Safety and Workplace Conditions

Article 1 of this Decree establishes the principles that promote safety, hygiene and health in the workplace, in accordance with precepts of paragraph 2 of Article 46 of Law 23/92 - Constitutional Law.

Item 1 of Article 4 (System's Goals) states that "Safety and Health at work aims to implement their right to safety and health protection in the workplace in order to organize and develop their activities in accordance with the methods and standards established by legislation for employers and workers, as well as the competent organs of the state involved in this matter, comply with the duties established in this decree." Item 2 of the same article indicates that the application of the established measures will assure the minimum safety conditions with a view to minimize the risk of accidents and occupational diseases.

According to Article 9 of the Decree, employers are required to take necessary measures so that work is performed in an environment that allows the normal physical, mental and social development of workers that protects them against potential work accidents and occupational diseases.

5.1.2.10 Executive Decree No.128/04 on Regulation on Safety and Health for Workplace Signage

According to Article 1 of this Decree, this Regulation lays down minimum requirements for health and safety signage in the workplace, regulating rules on the use of signage, firefighting equipment, marking routes, etc.

5.1.2.11 Presidential Decree No. 194/11 on Liability for Environmental Damage

Decree No. 194/11 establishes strict liability for degradation of the environment. Aimed at preventing and repairing environmental damages, the Decree establishes that all activities capable of causing damage to the environment (Article 3, Item 1) are considered liabilities and are subject to regulation under the "polluter pays" principle.

According to the Decree, any entity responsible for pollution, by act of wilful misconduct or negligence, will also be held responsible for the clean-up and restoration of environmental damage. Responsibility will be held for losses and damages caused to the environment by way of compensation for damages and environmental recovery measures.

Whenever environmental damage occurs, according to Article 11, the operator shall promptly advise the competent authority of all relevant aspects of the situation and take the following measures:

- The proper steps to immediately control, contain, eliminate or otherwise manage the relevant pollutant elements and any other hazardous factors in order to limit or prevent additional environmental damage and adverse effects on human health or further deterioration of services; and
- The necessary repair measures.

Environmental quality standards in Angola are based on International Organisation for Standardization (ISO) standards which should be used as a guide for determining levels of pollution. Article 18 confirms the right of the public to request intervention when there is concern that environmental damage has taken place. In Article 21, the Decree also states that any individuals or legal entities which carry out activities that impose environmental risks shall have civil liability insurance.
5.1.2.12 Water Law No. 6/02

In terms of Article 68, Section 1 of the Water Law No. 6/02, “the discharge of wastewater, wastes or other substances, and any activities that cause pollution or degradation of public water, is dependent on authorisation granted by the institution responsible for managing water resources …”

Pursuant to Article 22 and 24, water uses are classified as common (public) use, which refers to water taken from natural sources without any administrative approval, or private water use, which requires a license or concession in terms of this Law. Common (public) water uses have priority over private water uses. Articles 24 and 26 of the Act further clarify private uses that do not require a license or concession, which includes the use of water from lakes, lagoons, wetlands, springs, groundwater sources outside of protected areas and rainwater for domestic and agricultural use.

5.1.2.13 Presidential Decree No. 261/11 on Water Quality

Presidential Decree No. 261/11 serves as an addition to the national Water Law No. 6/02, dealing specifically with water quality. It establishes the roles within the Angolan governmental administration for overseeing water quality issues and addresses water quality standards relating to human consumption and wastewater. The decree also indicates the role of water quality monitoring along with the standard parameters for both drinking water and surface water, and emissions limits for wastewater discharge (in Annex VI).

According to the item 3 of Article 1, this law also regulates the control standards of wastewater discharge to waterbodies and soil, in order to preserve the quality of the aquatic environment and protect public health.

Article 13 of Chapter III (Protection of Waters Against Pollution of Discharged Wastewater) establishes that discharge of wastewater from a treatment facility to water and soil requires a license to be issued by the MinAmb, in which discharge standards for mitigation or prevention of damage are set.

5.1.2.14 Decree No. 40.040 on Protection of Terrestrial Fauna

This Decree regulates the protection of wildlife, with the objectives of conservation and sustainable use without causing undue harm.

5.1.2.15 Resolution No. 42/06 on the National Biodiversity Strategy and Action Plan

To implement the recommendations from the United Nations Convention on Biological Diversity (UNCBD, ratified by the Resolution No. 23/97) the Angolan Government has approved, through Resolution No. 42/06 of July 26th, the National Biodiversity Strategy and Action Plan (NBSAP). This strategy aims to incorporate measures for the conservation and sustainable use of biological diversity, and the fair and equitable distribution of biological resources in favour of all Angolans, into policies and development programmes.

5.1.2.16 Territory and Urbanism System Law No. 3/04

The Territory and Urbanism System Law No. 3/04 specifies that the use of land must comply with municipal or special territorial plans. The Act stipulates that the EIS must refer to these territorial plans.

5.1.2.17 Cultural Assets Law No. 14/05

The Cultural Assets Law No. 14/05 defines cultural assets as “all material and immaterial goods that, due to their acknowledged value, must be subject to legal guardianship”. The Law establishes the
duty of every citizen to “preserve, defend and value the cultural assets”. Application for the demolition or destruction of cultural assets must be submitted to the Ministry of Culture.

5.1.2.18 Resolution No. 52/08 on the National Strategy for the Implementation of UN Convention on Climate Change and Kyoto Protocol

To ratify the Convention and the Protocol, Angola undertook to comply with the provisions in these two international legal instruments. The Strategy aims to establish the framework for intervention in Angolan legislation and the development of human skills and technology to help stabilise the emissions of greenhouse gases.

5.1.2.19 Land Law No. 9/04

The expropriation of land (privately owned or land awarded by the State), as a result of inundation, is regulated by Article 12 of the Land Law No 9/04 as well as Article 21 and Article 132 of the General Land Concession Regulation. Should community property be affected, the traditional authorities must be consulted and compensation must be paid according to Article 37 of the Land Law.

5.1.2.20 General Labor Law No. 2/00

In terms of the General Labor Law No. 2/00, employers are responsible to ensure a safe and healthy work environment. Article 53 and Article 84 prescribe the specific duties of employers. The Law also outlines the duties of workers to ensure their personal safety and the safety of others (Article 13/1).

Decree No. 31/94 further enforces the rights of workers to a safe and hygienic work environment by ensuring workers receive protective gear and equipment and regular information on workplace safety, hygiene and health related issues is provided to workers.

The Law also provides for the rights of workers to adequate housing (including their families) to ensure decent living standards (i.e. in accordance with hygiene and sanitation standards).

5.2 International Standards

5.2.1 IFC Performance Standards

The IFC PS’s on Environmental and Social Sustainability, which were published in January 2012, are recognised as being the most comprehensive standards available to international finance institutions working within the private sector. The principles provide a framework for an accepted international approach to the management of social and environmental issues.

The eight IFC PS’s are:

- **PS1: Assessment and Management of Social and Environmental Risks and Impacts** underscores the importance of managing environmental and social performance throughout the life of a project. Performance Standard 1 requires the client to conduct a process of environmental and social assessment and to establish and maintain an Environmental and Social Management System (ESMS), appropriate to the nature and scale of the project and commensurate with the level of its environmental and social risks and impacts. PS1 aims to:
  - Identify and evaluate environmental and social risks and impacts of the project;\(^7\)
  - Adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, affected communities, and the environment;

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\(^7\) This includes cumulative impacts. The IFC’s *Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets*, published in 2013 provides guidance.
Promote improved environmental and social performance of clients through the effective use of management systems;

- Ensure that grievances from affected communities and external communications from other stakeholders are responded to and managed appropriately;

- Promote and provide means for adequate engagement with affected communities throughout the project cycle on issues that could potentially affect them; and

- Ensure that relevant environmental and social information is disclosed and disseminated.

- **PS2: Labour and Working Conditions** recognizes that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers. PS2 aims to:

  - Promote fair treatment, non-discrimination and equal opportunity of workers;
  
  - Establish, maintain and improve the worker-management relationship;
  
  - Promote compliance with national employment and labour laws;
  
  - Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties and workers in the client’s supply chain; and
  
  - Promote safe and healthy working conditions and the health of workers; and avoid the use of forced labour.

- **PS3: Resource Efficiency and Pollution Prevention** recognizes that increased economic activity and urbanization often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. Thus, PS3 aims to:

  - Avoid or minimise pollution from project activities;
  
  - Promote more sustainable use of resources (including energy and water); and
  
  - Reduce project-related Greenhouse Gas (GHG) emissions.

- **PS4: Community Health, Safety and Security**, recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. PS4 aims to:

  - Anticipate and avoid adverse impacts on the health and safety of affected communities during the project life from both routine and non-routine circumstances; and
  
  - Ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the affected communities.

- **PS5: Land Acquisition and Involuntary Resettlement**, recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. PS5 thus aims to:

  - Avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs;
  
  - Avoid forced eviction;
  
  - Anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement
activities are implemented with appropriate disclosure of information, consultation and the informed participation of those affected; and

- Improve, or restore, the livelihoods and standards of living of displaced persons.

**PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources**, recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. PS6 aims to:

- Protect and conserve biodiversity;
- Maintain the benefits from ecosystem services; and
- Promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.

**PS7: Indigenous Peoples**, recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. PS7 thus aims to:

- Ensure that the development process fosters full respect for human rights, dignity, aspirations, culture and natural resource-based livelihoods of Indigenous Peoples;
- Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts;
- Promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner;
- Establish and maintain an ongoing relationship based on informed consultation and participation with the Indigenous Peoples affected by a project throughout the project’s life-cycle;
- Ensure the Free, Prior and Informed Consent of the affected communities of Indigenous Peoples when the circumstances described in this Performance Standard are present; and
- Respect and preserve the culture, knowledge and practices of Indigenous Peoples.

**PS8: Cultural Heritage** recognizes the importance of cultural heritage for current and future generations. As such, PS8 aims to:

- Protect cultural heritage from the adverse impacts of project activities and support its preservation; and
- Promote the equitable sharing of benefits from the use of cultural heritage.

PS1 thus establishes the importance of (i) integrated assessment to identify the environmental and social impacts, risks, and opportunities of projects; (ii) effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and (iii) the client’s management of environmental and social performance throughout the life of the project.

IFC PS’s 2 through 8 present requirements to avoid, reduce, mitigate or compensate for impacts on people and the environment, and to improve conditions where appropriate. Where social or environmental impacts are anticipated, the client is required to manage them through its ESMS consistent with PS1.
The IFC PS’s are matched with corresponding Guidance Notes that provide guidance on the requirements contained in the standards and on good sustainability practices to help clients improve project performance.

Note that PS7 is not considered applicable to this Project.

5.2.2 World Bank/IFC Environmental Health and Safety Guidelines

The World Bank Environmental Health and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP), as defined in IFC’s PS3 on Resource Efficiency and Pollution Prevention8.

The EHS Guidelines contain the performance levels and measures that are normally acceptable to IFC and are generally considered to be achievable in new facilities at reasonable costs by existing technology. For IFC-financed projects, application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets with an appropriate timetable for achieving them. The environmental assessment process may recommend alternative (higher or lower) levels or measures, which, if acceptable to IFC, become project- or site-specific requirements.

When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

The EHS Guidelines for Construction Materials Extraction include information relevant to construction materials extraction activities such as aggregates, limestone, slates, sand, gravel, clay, gypsum, feldspar, silica sands, and quartzite, as well as to the extraction of dimension stone. It addresses extraction activities supporting construction, civil works, and cement projects. The EHS Guidelines provide a summary of EHS issues associated with construction materials extraction that occur during the operational, construction, and decommissioning phases (e.g. air emissions, noise and vibration, water pollution, respiratory hazards, risks from uncontrolled access and land instability), along with recommendations for their management.

EHS Guidelines for Electric Power Transmission and Distribution apply more to powerlines and are not deemed relevant to this project.

5.2.3 Equator Principles

The EP are a voluntary set of guidelines developed by leading financial institutions for managing environmental and social issues in project finance lending. The Principles require observance of the IFC PS's and the EHS Guidelines when developing projects in non-high income OECD countries. The guidelines provide an approach to determine, assess and manage environmental and social risk in project financing.

Financed projects must be undertaken “in a manner that is socially responsible and reflect sound environmental management practices”. The intention is to ensure that projects are developed in a site specific manner that is socially responsible and reflects sound environmental management practices.

8 The information in this section has been sourced and modified from http://www.ifc.org/ifcext/enviro.nsf/Content/EnvironmentalGuidelines.
5.2.4 World Commission on Dams

The WCD was a global multi-stakeholder body initiated in 1997 by the WB and the IUCN in response to growing opposition to large dam projects. The WCD established comprehensive guidelines for dam building (in the WCD Report, 2000) that are intended to protect dam-affected people and the environment, and ensure that the benefits from dams are more equitably distributed.

The WCD has developed five core values that must be applied to all decisions relating to water and energy development projects. If applied throughout the project cycle, these values will ensure improved decision-making processes that will deliver improved outcomes for all stakeholders. The WCD has grouped the core values under five principal headings:

- Equity;
- Efficiency;
- Participatory decision-making;
- Sustainability; and
- Accountability.

Seven strategic priorities (WCD SPs) and related policy principles have been identified by the WCD for future decision-making. These strategic priorities provide guidelines for achieving equitable and sustainable development through a process that successfully integrates social, economic and environmental considerations into decision-making on large dams and their alternatives (WCD, 2000).

The WCD SPs are:

1. **Gaining Public Acceptance** – This is essential for equitable and sustainable water and energy resources development. Effective implementation of this strategic priority depends on applying these policy principles:

   - Recognition of rights and assessment of risks are the basis for the identification and inclusion of stakeholders in decision-making on energy and water resources development;
   - Access to information, legal and other support is available to all stakeholders, particularly indigenous and tribal peoples, women and other vulnerable groups, to enable their informed participation in decision-making processes;
   - Demonstrable public acceptance of all key decisions is achieved through agreements negotiated in an open and transparent process conducted in good faith and with the informed participation of all stakeholders; and
   - Decisions on projects affecting indigenous and tribal peoples are guided by their free, prior and informed consent achieved through formal and informal representative bodies.

2. **Comprehensive Options Assessment** - Explore alternatives for dams, needs for water, food and energy must be assessed and objectives clearly defined. Effective implementation of this strategic priority depends on applying these policy principles:

   - Development needs and objectives are clearly formulated through an open and participatory process before the identification and assessment of options for water and energy resource development;
   - Planning approaches that take into account the full range of development objectives are used to assess all policy, institutional, management, and technical options before the decision is made to proceed with any programme or project;
• Social and environmental aspects are given the same significance as technical, economic and financial factors in assessing options;

• Increasing the effectiveness and sustainability of existing water, irrigation, and energy systems are given priority in the options assessment process; and

• If a dam is selected through such a comprehensive options assessment process, social and environmental principles are applied in the review and selection of options throughout the detailed planning, design, construction, and operation phases.

3. Addressing Existing Dams - Optimise benefits from existing dams, address outstanding social issues and strengthen environmental mitigation and restoration measures. Effective implementation of this strategic priority depends on applying these policy principles:

• A comprehensive post-project monitoring and evaluation process and a system of longer term periodic reviews of the performance, benefits, and impacts for all existing large dams are introduced;

• Programmes to restore, improve and optimise benefits from existing large dams are identified and implemented. Options to consider include rehabilitate, modernise and upgrade equipment and facilities, optimise reservoir operations and introduce non-structural measures to improve the efficiency of delivery and use of services;

• Outstanding social issues associated with existing large dams are identified and assessed; processes and mechanisms are developed with affected communities to remedy them;

• The effectiveness of existing environmental mitigation measures is assessed and unanticipated impacts identified; opportunities for mitigation, restoration and enhancement are recognised, identified and acted on; and

• All large dams have formalised operating agreements with time-bound license periods; where re-planning or relicensing processes indicate that major physical changes to facilities or decommissioning, may be advantageous, a full feasibility study and environmental and social impact assessment is undertaken.

4. Sustaining Rivers and Livelihoods – Avoid impacts on rivers, watersheds and aquatic ecosystems through good site selection and project design. Effective implementation of this strategic priority depends on applying these policy principles:

• A basin-wide understanding of the ecosystem’s functions, values and requirements, and how community livelihoods depend on and influence them, is required before decisions on development options are made;

• Decisions value ecosystems, social and health issues as an integral part of project and river basin development and prioritise avoidance of impacts in accordance with a precautionary approach;

• A national policy is developed for maintaining selected rivers with high ecosystem functions and values in their natural state. When reviewing alternative locations for dams on undeveloped rivers, priority is given to locations on tributaries;

• Project options are selected that avoid significant impacts on threatened and endangered species. When impacts cannot be avoided viable compensation measures are put in place that will result in a net gain for the species within the region; and
• Large dams provide for releasing environmental flows to help maintain downstream ecosystem integrity and community livelihoods and are designed, modified and operated accordingly.

5. Recognising Entitlements and Sharing Benefits – Recognise entitlements that improve livelihoods and quality of life, and that affected people are beneficiaries of the project. Effective implementation of this strategic priority depends on applying these policy principles:

• Recognition of rights and assessment of risks is the basis for identification and inclusion of adversely affected stakeholders in joint negotiations on mitigation, resettlement and development related decision-making;

• Impact assessment includes all people in the reservoir, upstream, downstream and in catchment areas whose properties, livelihoods and non-material resources are affected. It also includes those affected by dam related infrastructure such as canals, transmission lines and resettlement developments;

• All recognised adversely affected people negotiate mutually agreed, formal and legally enforceable mitigation, resettlement and development entitlements; and

• Adversely affected people are recognised as first among the beneficiaries of the project. Mutually agreed and legally protected benefit sharing mechanisms are negotiated to ensure implementation.

6. Ensuring Compliance – Ensure public trust and compliance with applicable regulations, criteria and guidelines, and project-specific negotiated agreements is secured at all critical stages in project planning and implementation. Effective implementation of this strategic priority depends on applying these policy principles:

• A clear, consistent and common set of criteria and guidelines to ensure compliance is adopted by sponsoring, contracting and financing institutions and compliance is subject to independent and transparent review;

• A Compliance Plan is prepared for each project prior to commencement, spelling out how compliance will be achieved with relevant criteria and guidelines and specifying binding arrangements for project-specific technical, social and environmental commitments;

• Costs for establishing compliance mechanisms and related institutional capacity, and their effective application, are built into the project budget;

• Corrupt practices are avoided through enforcement of legislation, voluntary integrity pacts, debarment and other instruments; and

• Incentives that reward project proponents for abiding by criteria and guidelines are developed by public and private financial institutions.

7. Sharing Rivers for Peace, Development and Security – Ensure the use and management of resources to promote mutual self-interest for regional co-operation and peaceful collaboration. Effective implementation of this strategic priority depends on applying these policy principles:

• National water policies make specific provision for basin agreements in shared river basins. Agreements are negotiated on the basis of good faith among riparian States. They are based on principles of equitable and reasonable utilisation, no significant harm, prior information and the Commission’s strategic priorities;

• Riparian States go beyond looking at water as a finite commodity to be divided and embrace an approach that equitably allocates not the water, but the benefits that can be derived from it.
Where appropriate, negotiations include benefits outside the river basin and other sectors of mutual interest;

- Dams on shared rivers are not built in cases where riparian States raise an objection that is upheld by an independent panel. Intractable disputes between countries are resolved through various means of dispute resolution including, in the last instance, the International Court of Justice;

- For the development of projects on rivers shared between political units within countries, the necessary legislative provision is made at national and subnational levels to embody the Commission's strategic priorities of ‘gaining public acceptance’, ‘recognising entitlements’ and ‘sustaining rivers and livelihoods’; and

- Where a government agency plans or facilitates the construction of a dam on a shared river in contravention of the principle of good faith negotiations between riparians, external financing bodies withdraw their support for projects and programmes promoted by that agency.

Five key stages and critical decision points have been identified as having a particularly strong influence on the final outcome. These key stages provide a framework within which decision-makers and stakeholder groups can be assured of compliance with agreed procedures and commitments. The first two key stages relate to water and energy planning, leading to decisions on a preferred development plan:

- Needs assessment: validating the needs for water and energy services; and
- Selecting alternatives: identifying the preferred development plan from among the full range of options.

Where a dam emerges from this process as a preferred development alternative, three further critical decision points occur:

- Project preparation: verifying that agreements are in place before tender of the construction contract;
- Project implementation: confirming compliance before commissioning; and
- Project operation: adapting to changing contexts.

The five key stages/decision points are supported by a set of key criteria that describe the processes required for compliance. The criteria are presented in the form of checklists for each decision point that provide a clear and open mechanism for determining whether the WCD's recommendations have been followed and the process can proceed to the next stage of planning or implementation.

The WCD strategic priorities are also matched with corresponding guidelines. These guidelines describe in general terms how to assess options and plan and implement dam projects to meet the WCD’s criteria and to meet good practice. They are advisory tools to support decision-making and need to be considered within the framework of existing international guidance and current good practice.

### 5.2.5 World Bank Safeguard Policy of Dams

The WB Operational Policies (OPs) have been identified by WB as being particularly important in ensuring that Bank operations do no harm to people and the environment. There are 10 safeguard policies (WB SPs), comprising the Bank's policy on EIA and policies on: Cultural Property; Disputed Areas; Forestry; Indigenous Peoples; International Waterways; Involuntary Resettlement; Natural Habitats; Pest Management; and Safety of Dams.
Operational Policy (OP) 4.37: Safety on Dams requires that experienced and competent professionals design and supervise construction, and that the borrower adopts and implements dam safety measures throughout the project cycle. The policy also applies to existing dams where they influence the performance of a project. In this case, a dam safety assessment should be carried out and necessary additional dam safety measures implemented. OP 4.37 recommends, where appropriate, that Bank staff discuss with the borrowers any measures necessary to strengthen the institutional, legislative, and regulatory frameworks for dam safety programs in those countries.
6 Status of Compliance

This section describes the status of compliance of the project. A detailed record and analysis of compliance against legislation and standards listed in the governance framework was undertaken and captured in a comprehensive compliance matrix as a working document not intended or suitable for disclosure. This informed the reporting on the status of compliance and the recommendations presented in this section. More precise actions to achieve compliance with the governance framework are presented in the ESAP in Appendix C.

6.1 Host Country Legislation and Permitting

Two tunnels were excavated in the first phase of the project to divert the Kwanza River away from the dam wall construction site (see Section 3.2). A separate Kwanza River Diversion ESIA, dated January 2013, was compiled and submitted to MinAmb in April 2013. This ESIA was not reviewed by SRK. The tunnels were commissioned in September 2014. MinAmb issued an Environmental License (dated 19 February 2014) to GAMEK for the deviation tunnels, valid for the project construction phase, until 18 February 2017. MinAmb confirmed that an operation phase Environmental License is not required for the deviation tunnels.

An ESIA for the Laúca Hydropower Project was compiled by Holísticos and Intertechne and submitted to MinAmb in May 2013, in fulfilment of Angolan environmental regulatory requirements, particularly the General Environmental Law No 5/98 and Decree No. 51/04. The scope of the ESIA includes a compacted cement cylinder dam (132 m high), water intakes and conduits, main powerhouse with six turbine units and second (ecological base flow) powerhouse, inundation of 188 km², a landfill for waste generated by the project and provision of basic project infrastructure for access, water supply, sewage treatment etc. The ESIA includes recent and sufficiently detailed baseline data, based on published information, results of previous surveys undertaken in 2007-2009 for the Laúca-Caculo Cabaça Dams and in 2012 for the Kwanza River Diversion ESIA, as well as supplementary social, botanical and fauna surveys undertaken for the Laúca Hydropower Project ESIA in 2013.

MinAmb conducted a public hearing on the project on 2 April 2014.

On 28 January 2014 MinAmb issued a Technical Report indicating their “satisfaction” with the ESIA but requesting an Addendum to the ESIA addressing changes to the Project, as well as listing a number of additional information requirements regarding the Project alignment with government plans and programmes, assessment of cumulative impacts and heritage aspects, monitoring of meteorological conditions, air quality, noise and water quality and sampling of phytoplankton, zooplankton and sediments. The Technical Report also contained additional recommendations with regards to groundwater studies, a fauna and flora conservation programme and species inventory, ichthyofauna species inventory, water quality monitoring and appropriate waste separation and storage. In August 2014 GAMEK provided a written response to the Technical Report, advising that these issues are being addressed.

MinAmb awarded an Environmental License (dated 9 June 2014) to GAMEK for the Laúca Dam construction, valid for the project construction phase, until 8 June 2017. The Environmental License lists a number of conditions and requires GAMEK to demonstrate compliance with these to MinAmb. MinAmb indicated that they intend to conduct annual audits of the construction site. Following construction, GAMEK will need to apply to MinAmb for an operation phase Environmental License.

Since submission of the ESIA there have been some changes to the Project (e.g. changes in the length of adduction tunnels and the location of waste rock storage areas) and some additional activities (e.g. construction of 25 houses, installation of a 30 kV transmission line from Capanda to
Laúca and possible development of a second substation on the left bank of the river. These are neither described nor assessed the ESIA. Projects implemented for the social responsibility programme may also generate impacts and require licensing in their own right (e.g. new agriculture or aquaculture projects).

Following submission of documentation motivating water abstraction from and effluent discharge to the Kwanza River during the construction period, MinEA issued Odebrecht with a permit for water abstraction. Effluent quality is monitored in accordance with Odebrecht's Monitoring and Measurements Plan (Plano de Monitoramento, Medicação e Mensuração de Desempenho em SSMA, no document number). In terms of the Water Law No. 6/02 and Presidential Decree No. 261/11 on Water Quality, GAMEK may still need to obtain a license to discharge polluted water, including wastewater from the sewage treatment works, into the Kwanza River (even though no reference was made to this in correspondence from MinEA).

Presidential Decree No. 190/12 on Waste Management requires that all private or public entities producing wastes must develop a Waste Management Plan. Odebrecht has a waste management and disposal system with associated procedures addressing all waste streams generated on site (see Section 3.1). It is not known whether the plan is compliant with legislative requirements for a Waste Management Plan.

Odebrecht (and GAMEK) are obliged to ensure a safe and healthy work environment: Odebrecht has taken necessary measures to protect workers against potential work accidents and occupational diseases and provides adequate worker housing in compliance with the General Labour Law No. 2/00.

The ESIA and the scope of this ESDD review exclude power transmission lines.

Recommendations

- Confirm the need for additional permits, notably for the discharge of effluent into the Kwanza River) and provide evidence that other outstanding permits have been applied for.

- Provide evidence that items in the Technical Report issued by MinAmb and any other relevant license or permit conditions have been resolved and/or incorporated into Odebrecht's legal register (for subsequent action).

- Compile an Addendum to the ESIA as prescribed by MinAmb, addressing any changes to project and additional project activities not included in the ESIA. The Addendum should describe changes and new activities, assess associated impacts and recommend mitigation measures. Such measures must be incorporated into relevant ESHS documents and implemented.

- Confirm legal and permitting requirements pertaining to other peripheral activities associated with the Project, e.g. Corporate Social Responsibility (CSR) and document in the legal register. Obtain necessary licenses.

- Provide evidence that Odebrecht's waste management plan and procedures comply with legislative requirements for a Waste Management Plan listed in Presidential Decree No. 190/12.

6.2 IFC Performance Standards

The IFC PS's cover eight areas that are viewed as essential aspects of GIIP, i.e. good international environmental and social performance. Review of GAMEK's and Odebrecht's conformance with IFC PS's indicates the following:
6.2.1 PS1: Assessment and Management of Environmental and Social Risks and Impacts

An ESIA incorporating an EMP was compiled by Holisticos and Intertechne as prescribed by Angolan legal requirements in 2013. In many respects the ESIA also complies with PS1. A comprehensive baseline description based on existing and primary data was provided, impacts were assessed and a framework management plan compiled. Intertechne is also integrally involved in the design of the dam and this may have compromised the actual and/or perceived independence of the ESIA.

In addition to the items identified in Section 6.1, the following aspects have not been discussed, assessed and/or rated in the ESIA Report as required in terms of the IFC PSs:

- Ecosystem services and emissions of greenhouse gases, including loss of carbon sequestration and emissions from biodegrading vegetation;
- Land capability of the inundated area and associated opportunities; and
- Cumulative impacts are not assessed and PS1 is clear that the project should consider cumulative impacts. However a Cumulative Impact Assessment (CIA), arising out of an ESDD of the Cambambe Project Phase 2, is currently underway, evaluating cumulative impacts of existing and planned projects on the Kwanza River from upstream of the Capanda Reservoir to the mouth of the river. A comprehensive CIA Scoping Report, defining the spatial and temporal boundaries of the CIA has been completed. The CIA is scheduled to be completed by June 2015.

The ESIA comprehensively described numerous alternatives and the motivation for selecting the implemented alternative. One of the motivations is the favourable energy generated : area inundated ratio, especially when benchmarked against large dams around the world. Nevertheless an area of 188 km² will be inundated to generate 2 070 MW versus Cambambe where 960 MW will be generated by a run-of-river dam where only 5.5 km² will be inundated. While SRK recognises that the Laúca project has a favourable ratio compared to international benchmarks, SRK notes that the topography at Laúca, where the Kwanza River flows through an incised gorge, also lends itself to a run-of-river reservoir and it is not evident that the alternative of constructing a lower dam wall and inundating a far smaller area with a potentially higher energy generated: area inundated ratio, was considered. It would have been instructive to record the trade-off between reduced energy generated by this alternative vis-a-vis opportunity costs of the larger area inundated by the selected alternative. SRK recognises that the Laúca project may be too advanced to consider changes of this nature.

Although it is SRK’s view that local stakeholders are well informed about the Project, only one round of consultation was conducted for the ESIA, supplemented by a public hearing conducted by MinAmb on 2 April 2014. While one round of consultation may satisfy national requirements for an ESIA, it is deficient with regards to GIIP. Odebrecht has undertaken two subsequent rounds of consultation with communities to the north and south of the river in May 2013 and again in September 2013. It is further noted that Odebrecht’s community relations and CSR initiatives have abetted community awareness and acceptance of the Project. A Social Communication Plan for Communities (the equivalent of a Stakeholder Engagement Plan) is in draft; and a formal grievance mechanism for communities will be integrated into this plan. An external grievance procedure was launched in September 2014 and suggestion boxes were installed in communities.

Odebrecht has a well-structured ESMS referred to as the Integrated Sustainability Programme (policies PI AHL 01 and PI AHL 02) comprising policies and procedures dealing with ESHS aspects. Although not an ISO accredited system it is understood that the programme is aligned with ISO 14001 and the Plan-Do-Check-Act cycle. Odebrecht has developed a system to capture...
mitigation measures listed in the ESIA and conditions of the Technical Report from MinAmb and track their implementation. Policies and procedures refer to Angolan standards and, where none exist, other international (e.g. Brazilian) standards, but do not refer specifically to the IFC standards. A comprehensive monitoring plan is in place. Internal review and non-conformances are addressed through separate procedures (procedures PI AHL 03, PI AHL 05, PI AHL 09 and PI AHL 10) and the latter (correcting non-conformances) is not adequately integrated into individual management procedures. ESHS portfolios are managed separately and would benefit from some integration between the teams and their activities. GAMEK implements customised policies and procedures per project they currently manage, but have no over-arching integrated management system addressing HSE matters across their operations.

It is evident that Odebrecht has executed many similar or more complex hydroelectric projects and has the skills and capacity to ensure sustainable ESHS management during construction. Odebrecht has separate management teams dealing with environment, health & safety and social matters respectively, although some responsibilities overlap. At present ENE and GAMEK are the designated entities responsible for the generation of electricity and the management of hydropower projects. It is understood that the organisational structure of Angola’s electricity sector is under review and roles and responsibilities for the future operation of the Project are, therefore, uncertain. GAMEK’s capacity is difficult to gauge and GAMEK has not yet determined staffing requirements to operate Laúca, making it difficult and perhaps (and unfortunately) premature to implement capacity building and skills transfer programmes. Odebrecht is contracted to train 300 people for Angola’s electricity sector and initiate the programme in 2016. Additional training will also be provided by Coba and Lahmeyer International during the Laúca construction phase. However, hands-on training is not a substitute for capacity building.

Key suppliers to the project include security contractors, local suppliers of construction materials and food and waste disposal contractors. Odebrecht has verified that key waste contractors have the necessary licenses; however additional waste recycling contractors are still being identified.

**Recommendations**

- Ensure that the CIA is completed and that relevant mitigation measures are implemented.
- Integrate all mitigation measures from the ESIA, conditions in the Technical Report by MinAmb and – when issued – the Environmental License, as well as IFC EHS requirements into Odebrecht’s procedures. Demonstrate integration, e.g. in a Commitments Register.
- Incorporate a procedure in Odebrecht’s Integrated Sustainability Programme that describes, assesses and discloses major project changes to stakeholders, authorities and the Lender Group.
- Integrate a system for internal review, investigation of non-conformances and amendment of policies and procedures into the management procedures.
- Encourage more integration between the health & safety, environment and social portfolios to identify and effectively manage overlaps.
- Finalise the Social Communication Plan for Communities in discussion with the community and disclose to stakeholders. Identify and consider particularly vulnerable groups within the local communities.
- Develop and implement a more formalised grievance mechanism for external stakeholders, not only targeting villages.
- Provide a written outline of the anticipated governance structures for the Laúca Hydropower Project.
- Ensure that all relevant primary suppliers are aware of and comply with the project Integrated Sustainability Programme.

- Confirm management and skills requirements for the operations phase, and design and implement a structured capacity building programme to supplement planned training programmes.

- Provide evidence that key waste contractors have the necessary licenses.

6.2.2 PS2: Labour and Working Conditions

Odebrecht applies the laws of Angola prescribing working conditions. A formalised recruitment plan is implemented with respect to the (maximum) ~6,000 workers to be employed during the construction phase. The recruitment policy commits Odebrecht to the principles of equal opportunity and fair treatment. Preference is given to the employment of locals, although this may not specifically be stated in the labour policy. Odebrecht does not make use of forced or child labour. GAMEK’s recruitment policy was not reviewed.

Workers have brought grievances to the attention of management in the past and Odebrecht commissioned Deloitte to conduct an independent survey amongst workers regarding their concerns. In September 2014, a formal grievance mechanism for workers and on-site contractors (procedure AHL-PQ-OO-G-0001) was implemented on site. A union was formed at Laúca in March 2014, which Odebrecht considers to be a positive development, and the company has a collective agreement with the union that sets out working conditions.

Odebrecht has project-specific occupational health and safety procedures that have application during the construction and commissioning phases. A strong safety culture is evident, with particular emphasis on working at heights and in confined spaces, which are some of the key occupational safety risks. Workers are required to use Personal Protective Equipment and working areas are evacuated during blasting. Initial 2-day training and safety inductions as well as the daily safety / team talks are an important vehicle for reinforcing safety culture. Malaria is prevalent in the area, but daily fogging occurs. On-site health care facilities are considered adequate, given the remote location of the site, and provision is made for medical evacuation by road or air where necessary. All workers receive medical entrance and exit exams.

The site camp provides four types of accommodation for personnel not resident in the area: single occupation, double occupation, 3 persons sharing and 4 persons sharing a room and bathroom. Entertainment, canteen, laundry and sports facilities are provided. Accommodation facilities are provided on-site and not in adjacent communities. There are no restrictions on freedom of movement or association of workers (except in secure areas). While a proportion of the construction camp facilities will be of a more transient nature, some of the accommodation facilities and amenities may be utilised during the operation phase. At the end of the contract, Odebrecht will aim to offer suitably qualified employees positions on other contracts in Angola, depending on the availability of such positions, although employees are under no obligation to take these positions. Odebrecht provides employees with technical work skills that also allow for employment elsewhere. Dismissal, where required, is done in line with the collective bargaining agreement.

Third party employers are required to adhere to Odebrecht’s Human Resources Policy and practices. There is no formal policy for the management and monitoring of the performance of third party employers in accordance with PS2. Some of the requirements for PS2 are addressed in contractual agreements. Sub-contracted workers receive the same induction as direct employees, and all HR policies apply equally to sub-contractors.
Clearing of unexploded ordinance has been completed in work areas, and Odebrecht is awaiting the mine clearing certificate.

**Recommendations**

- Review contractors’ HR policies and practices to assess and ensure compliance with Odebrecht HR policy and practice.
- Obtain a land mine clearing certificate for the construction area.

### 6.2.3 PS3: Resource Efficiency and Pollution Prevention

Application of **resource efficiency** principles is evident through reuse of materials (e.g. excavated rock in concrete manufacturing, thereby reducing waste rock and quarrying) and waste minimisation (e.g. by reusing and recycling waste and effluent and applying energy-saving and water-wise principles in offices and accommodation). Resource efficiency principles are included in relevant policies, e.g. the waste management policy (*PI AHL 25*) and effluent management policy (*PI AHL 22*) refer to the avoidance, reduction and reuse of waste / effluent. The Project aims to reuse 8% of water and recycle 30% of waste. Sustainability performance indicators, including environmental criteria, form part of staff performance targets.

**Waste** treatment and disposal facilities in Angola are known to be inadequate and Odebrecht has developed waste management facilities on site which allow for the incineration of all hazardous and medical waste, waste separation for recycling, composting of food and waste wood / vegetative matter (to produce mulch for future use in rehabilitation) and the disposal of all remaining waste to a landfill developed on site. The first landfill cell has almost been filled and new cells will be developed as the need arises. Landfill cells are lined with an impermeable lining and allowance is made for the drainage of leachate, which will be treated at the effluent treatment plant. The hazardous waste incinerator, installed in April 2014, is still being calibrated and a third party has been appointed to monitor emissions from the incinerator.

Third party contractors to **recycle** certain waste streams have been identified, while Odebrecht is still in the process of identifying companies with the capacity to recycle others. Odebrecht has verified that identified and/or appointed contractors are in fact able and authorised to recycle waste.

Solid waste and effluent management facilities will be required for the **operations phase** of the Project to service approximately 26 technical staff and a number of support and administrative staff (and potentially family members) expected to live at Laúca. The opportunity to utilise the existing facilities during the operations phase rather than building new infrastructure, as is envisaged, and perhaps also service local villages should be considered.

The Project will reduce reliance on fossil fuels and limit national release of **GHG emissions**. Key sources of GHG emissions by the Project are clearing of vegetation prior to inundation, diesel consumption during construction and releases from inundated biomass. Some emissions will be generated from landfill sites. Rehabilitation and revegetation of degraded areas (in the future) will sequester carbon and offset emissions. Odebrecht indicates that a carbon inventory is maintained for the Project.

There are no major sources (e.g. processing plants, stacks etc.) of **pollution**, nor transboundary implications or legacy pollution concerns. Key pollution risks include sewage, hydrocarbon spills from storage facilities and workshops, unmanaged domestic and industrial waste disposal, inappropriate storage of chemicals and hazardous substances, dust/particulates from blasting, quarrying, earthworks, roads and the surplus material dump and concrete additives. The majority of these risks appear to be well managed. Sedimentation during construction and commissioning may impact on downstream areas and the operation of the power plant. Odebrecht proposes hydrological modelling
(as required in the ESIA) to inform some aspects of the Project, however the scope and purpose of the modelling is not clearly defined.

Odebrecht is investigating the feasibility of establishing aquaculture farms in the dam for communities to more efficiently use of the reservoir as a resource. The potential impacts of the aquaculture farms have not been investigated, and the need for an Environmental License (or any other permits) will need to be investigated. Barring areas secured for safety reasons, communities will have open access to the reservoir.

**Recommendations**

- Identify contractors with the capacity to recycle relevant waste streams and verify that they have appropriate facilities and permits.
- Provide evidence that recycling companies are able and authorised to accept and recycle waste.
- Provide evidence of the monitoring of emissions from the incinerator.
- Clearly define the scope and purpose of the hydrological modelling proposed by Odebrecht, as well as the intended timeframes for modelling.
- Provide results of the carbon inventory and estimate GHG for the Project.
- Rather than developing additional waste management, water treatment and sewage treatment facilities for use during operations, consider making use of the existing facilities. The opportunity for providing waste disposal services to local communities may also be considered.
- Review opportunities for reducing GHG emissions and using renewable energy sources for Project facilities.

**6.2.4 PS4: Community Health, Safety and Security**

The health and safety components of Odebrecht’s Integrated Sustainability Programme have an occupational focus, with considerably less emphasis on local communities. The ESIA notes the risk that the Project may increase the number of accidents and incidence of diseases and psychosocial disturbances in surrounding communities.

In cooperation with local government, Odebrecht has constructed and upgraded a number of facilities in villages north of the project, to contribute towards improved community health. These include communal water taps (using solar energy to pump groundwater) and the rehabilitation and expansion of an existing clinic in Ngola Ndala village, which Odebrecht also provided with an initial inventory of medication and helped the local government (responsible for the on-going operation of this facility) to appoint a nurse. Installation of latrines is planned.

**Campaigns** undertaken by Odebrecht in local villages include health awareness and medical assistance, with a particular focus on malaria prevention, assisting government to distribute mosquito nets, training midwives in communities, environmental awareness, waste management and clean-up of villages. Similar campaigns are planned in the future.

Odebrecht is in the process of rehabilitating and expanding two local schools and has helped the local government to appoint teachers and implement the school curriculum and a literacy programme for adult villagers. By providing building material and planning input, Odebrecht is assisting local government and villagers in a programme of voluntary village consolidation, whereby residents of remote villages can relocate to two areas nearer public services and amenities (centred around Ngola Ndala and Nyanga Ya Pepe in Kwanza Norte, and Muta in Malange). These initiatives generally have a focus on health and hygiene, with limited attention to safety. Drivers employed on the Project receive training designed to reduce speeding and dangerous behaviour on public roads.
It is crucial that relevant government departments support initiatives that require ongoing implementation and maintenance of the facilities. Odebrecht has signed Memorandums of Understanding with local government in this regard. Many programmes are aimed at building capacity within communities, rather than just providing resources and infrastructure.

Odebrecht’s ERP was updated in September 2014 to include possible off-site emergencies related to the project that may affect communities and makes provision for the involvement of local government agencies and communities in the case of an emergency. It is unclear if external resources are adequate to deal with an off-site emergency situation related to the project and how the relevant details of the ERP have been or will be disclosed to external stakeholders. Access to the site is secure, with security provided by independent (unarmed) contractors.

The draft Dam Safety Report commissioned for the project was submitted by Stucky on 30 September 2014 and indicates possible technical concerns regarding generators, surge tanks and headrace tunnels; these are being discussed with Odebrecht and GAMEK. The report will also determine the flood wave and physical extent of catastrophic flooding in the event of dam failure.

**Recommendations**

- Disclose relevant details of Odebrecht’s ERP to external stakeholders.
- Resolve any concerns raised in the Dam Safety Review Report.

### 6.2.5 PS5: Land Acquisition and Involuntary Resettlement

The Project will induce physical as well as economic displacement (see section 4.2) and as such a Resettlement Action Plan (RAP) is required (and acknowledged by Odebrecht). Two bridges across the Luinga River connecting villages to pastures and access across the Kwanza River connecting Kissauina South to villages north of the river will also be inundated, and the RAP should consider alternative access methods.

A consultant (I.D.O. Brasil) has been appointed to undertake a census in the three affected communities (Kissauina South, Bangwangwa and Ginguri) and to compile the RAP. The census is currently underway. The capacity and experience of the consultant appointed for this critical task is not clear. Furthermore, the limited timeframe in the original timeline, envisaging completion of the RAP by late 2014, is a potential concern given the difficulties in accessing the communities. The Scope of Work for I.D.O. Brasil is not yet finalised.

Visits to the three communities by the Lender Group in September 2014 confirmed Odebrecht’s ongoing engagement with the communities, and broad community support for resettlement. A resettlement committee comprising community, government and proponent representatives was established and three possible relocation sites have been identified in consultation with the communities.

**Recommendations**

- Develop a RAP in compliance with the requirements of PS5, addressing both physical and economic displacement, the relocation of cemeteries and access requirements.
- Confirm that the capacity and experience of the RAP consultant, scope of the appointment and the allowed timeframe are adequate. If not, consider appointing an appropriately qualified consultant and/or peer reviewer, and adjust and disclose the RAP timeframe (programme) if necessary.
6.2.6 PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

A detailed biophysical baseline was provided in the ESIA (see Section 6.1), although discussion of impacts is brief and not sufficiently explored. A fauna, flora and ichthyofauna monitoring campaign was undertaken by specialists in June 2014 to comply with conditions in MinAmb’s Technical Report. The surveys were undertaken in representative areas beyond the construction site. Follow up surveys will be undertaken quarterly. A Biodiversity Action Plan (BAP) has not been developed.

A limited number of provisioning ecosystem services has been identified in the area, though they are not named as such in the ESIA. These include fishing, charcoal production, water provision, recreation and use of medicinal plants. These are not clearly understood from a functional and livelihoods perspective.

Impacts on biodiversity and ecosystem services within the area to be inundated and the project footprint are largely unavoidable, although biodiversity impacts on the perimeter of the site can be managed. The ESIA states that “…environmental offsets aimed at recovering equivalent areas…,(should be)…executed…” but the ESIA consultant has advised that biodiversity offsets are not required (unless MinAmb includes such a condition in the Environmental License).

Once construction is complete Odebrecht will rehabilitate the site in accordance with the Rehabilitation Plan (PI AHL 39), apart from facilities that will be used by the operator. Due to the size of the disturbed area, rehabilitation requires sufficient resources and budget and should be implemented incrementally throughout the construction period. Rehabilitation will use plants cultivated by communities in an income generating project and mulch/compost produced from composting of organic wastes. Indigenous plants will be used for landscaping and rehabilitation.

The series of rapids on the Kwanza River could be regarded as a unique ecosystem under threat from the cumulative impacts of the series of eight dams planned for this reach of the river. Cumulative impacts of the dams on the Kwanza River should be assessed prior to the development of any new dams and relevant mitigation measures implemented/retrofitted.

Recommendations

- Request the ESIA consultant to consider GIIP and motivate why biodiversity offsets are not considered necessary, irrespective of MinAmb’s recommendations in this regard.
- Develop a Biodiversity Management Plan (BAP) aimed at identifying and implementing measures to reduce impacts and restore biodiversity and ecosystem services. The BAP must address protection of Red List species (and might need to consider biodiversity offsets if this is a condition of the Environmental License).
- Conduct a more detailed assessment of provisioning ecosystem services from a livelihoods perspective and include the results and associated actions in the BAP and RAP.

6.2.7 PS7: Indigenous Peoples

This standard is not considered applicable to the Project.

6.2.8 PS8: Cultural Heritage

No ethnological studies or identification of potential archaeological sites were conducted for the ESIA and, as acknowledged in the ESIA, the project could impact areas with artefacts of significance to Angolan History.

The Angolan Ministry of Culture undertook two site visits in September and December 2013 during which cultural resources near the construction areas, notably stone graves at a cave at Laúca Rock,
were identified. Odebrecht and GAMEK signed Memorandums of Understanding with the Ministry of Culture and the National Institute for Cultural Heritage in April and June 2014, confirming the Angolan Government as the party responsible for the identification and protection of cultural heritage, with support by Odebrecht. Limited capacity at government agencies is a concern in this regard.

Odebrecht's has a ('chance finds') procedure for the management of heritage resources encountered during the removal of vegetation), but awareness of the procedure amongst the workforce appears to be low.

**Recommendations**

- Confirm that the Ministry of Culture has taken adequate steps to identify and protect cultural heritage resources in the area affected by construction and inundation.
- Promote awareness and train staff to implement the heritage resources chance finds procedure during vegetation removal and earthworks.

### 6.3 Equator Principles

While the ESIA has been approved by the Angolan authorities and the project is largely compliant, the assessment documentation contains, and the site visit identified, a number of deficiencies in reference to international standards. The EPs are underpinned by the IFC PS’s, and so only limited comment on the EPs is provided here. The notable deficiencies include the following:

- A number of project aspects were neither anticipated nor assessed in the ESIA (see Section 6.1). Furthermore, cumulative impacts were not considered although a separate CIA (commissioned by Odebrecht for the Cambambe Phase 2 Project) is currently underway;
- Labour and workplace health and safety impacts are only marginally assessed in the ESIA, but it is evident that Odebrecht has the skills and capacity to ensure sustainable ESHS management during construction;
- In some instances IFC PS’s and WB EHS guidelines are mentioned but not consistently applied in the ESIA, and there is no system or audit trail which demonstrates that the WB EHS guidelines have systematically been incorporated into Odebrecht's management system;
- The EMP (in the ESIA) comprises several sub-programs, which are in effect management frameworks, not detailed plans or procedures. The EMP and sub-programs are not Action Plans since they do not define specific responsibilities, outcomes, measurable events with performance indicators, targets and acceptable criteria. However, Odebrecht has a range of detailed policies and procedures applicable to the construction and commissioning phase. A management system for the operations phase is not yet available, and training of GAMEK / ENE staff is incorporated into Odebrecht's contract;
- Stakeholder engagement during the ESIA may have satisfied Angolan requirements, but is considered deficient in terms of GIIP. No interim report (such as a Scoping Report) capturing issues and presenting proposed terms of reference was compiled or released. Odebrecht has undertaken subsequent rounds of consultation with communities and drafted a comprehensive Social Communication Plan for Communities;
- Grievance mechanisms for the community are not yet adequately formalised; and
- The ESIA undertaken by Holisticos in partnership with Intertechne (who are also appointed to design elements of the dam) was not independently reviewed.
6.4 World Commission on Dams and World Bank Safeguard Policy for Dams

Notable deficiencies in respect of WCD Strategic Priorities Review and World Bank Safeguard Policy for Dams review requirements include the following:

- Consultation during the ESIA was insufficient, and no interim report (such as a Scoping Report, as prescribed by the WCD Guidelines) was compiled or released. The consultation process was transparent, but abridged;

- Cumulative basin-wide impacts (especially arising from other dams planned on the Kwanza River), which could result in significant environmental and social impacts, are not considered. A separate CIA is, however, underway;

- There is no evidence pertaining to negotiations on mitigation and benefit sharing mechanisms; and

- The ERP does not address dam failure at present. Ongoing external quality control is provided by a consortium of Coba and Lahmeyer International who are also present on-site. Lenders have appointed Stucky to undertake an independent dam design and safety review, which indicates possible technical concerns regarding generators, surge tanks and headrace tunnels; these are being discussed with Odebrecht and GAMEK. The report will also determine the flood wave and physical extent of catastrophic flooding in the event of dam failure.

6.5 IFC EHS Guidelines

In some areas IFC PS's and EHS guidelines are mentioned but not consistently applied in the ESIA, and there is no system or audit trail which demonstrates that the IFC EHS guidelines have systematically been incorporated into Odebrecht's management system and procedures.
7 Conclusions

This review has shown that the Laúca Hydropower Project complies with host country legislation, but that additional work is required to meet international standards. Several gaps have been addressed since release of the Draft ESDD; as such the Final ESDD reports fewer gaps and the ESAP (provided in Appendix C) is appropriately trimmed. Virtually none of the gaps and deficiencies is considered material, and can be addressed in the short to medium term and incorporated in conditions and covenants attached to loans.

The following high level observations and findings provide context and serve as a precursor to the overview of the key risks summarised:

- **Context:** The 188 km$^2$ of land that will be inundated is State-owned and largely devoid of inhabitants. The ESIA identified one village (Kissaquina South) within the inundation area. Two other villages (Bangwangwa and Ginguri) will be located close to the future reservoir and are at increased risk of flooding during high rainfall events, and Odebrecht believes it will be prudent to resettle these villages. Resettlement will affect a total of 254 people. A number of villages are located along the public access road to Laúca and will not be inundated, although some economic displacement may occur. Most impacts and ESHS management challenges can reasonably be expected to manifest during the construction phase, while the operations phase is far more benign and warrants less active intervention to manage impacts, but demands vigilant monitoring of risks.

- **Integrated management system:** One of the main principles of GIIP is a comprehensive integrated management system. Odebrecht has a well-structured Integrated Sustainability Programme comprising policies and procedures dealing with ESHS aspects, though it is not a formalised, e.g. ISO 14001, system. It is important that continuous improvement is maintained.

- **Management commitment:** A review of Odebrecht’s corporate policies and procedures indicates a strong commitment to continually improving ESHS management so as to meet GIIP. This commitment was confirmed during meetings with the Odebrecht’s management.

- **Community relations:** GAMEK and Odebrecht have good relations with host communities and authorities, which have been built up through ongoing stakeholder engagement. Odebrecht has established a number of programmes for community consultation and CSR, aimed at community upliftment, notably in the villages located along the public access road to Laúca north of the Kwanza River. Communities located south of the Kwanza River are more difficult to access. The planned RAP for villages south of the Kwanza River was initiated in September 2014.

- **Safety culture:** A strong safety culture is evident, with particular emphasis on working at heights and in confined spaces, which are some of the key occupational safety risks. Initial day training and inductions as well as the daily safety / team talks are an important vehicle for reinforcing safety culture.

- **Housekeeping:** Odebrecht has implemented a waste and effluent management system on site, including reuse, recycling and composting of waste.

- **Labour:** Labour conditions on site comply with GIIP and collective bargaining agreements are honoured.

- **Health:** On-site healthcare facilities are considered adequate, and provision is made for evacuation where necessary.

Key conclusions, focusing on key risks for the project that specifically require additional assessment and management planning, include the following:
• **Assessment of environmental impacts**: An ESIA incorporating an EMP was compiled in 2013 by Holisticos and Intertechne. Intertechne is also integrally involved in the design of the dam and this may have compromised the actual and/or perceived independence of the ESIA. An Environmental License was granted in June 2014. The license contains a number of conditions, including those listed in a prior MinAmbTechnical Report, requesting an Addendum to the ESIA addressing changes to the Project as well as a number of additional information requirements and recommendations. GAMEK provided a written response to the Technical Report, advising that these issues are being addressed. Once addressed and approved by the MinAmb, the ESIA will be deemed to be in compliance with content requirements. The ESIA is deemed somewhat deficient in terms of GIIP, notably insofar as ecosystem services and emissions of greenhouse gases, land capability of inundated area and associated opportunities are neither described nor assessed in the ESIA. These deficiencies undermine the ESIA to a certain extent and may expose GAMEK to reputational and future legal risk, especially if there is a failure to identify and mitigate impacts. Cumulative impacts are also not assessed, a more serious deficiency; however a CIA, arising out of an ESDD of the Cambambe Project Phase 2, is currently underway, evaluating cumulative impacts of existing and planned projects on the Kwanza River from upstream of the Capanda Reservoir to the mouth of the river.

• **Resettlement Action Plan**: The Project will result in the physical displacement of at three villages and two cemeteries, as well as economic displacement and as such a RAP is required. Consultants have been appointed to prepare a RAP. The capacity and experience of the consultant appointed for this critical task is not clear. Furthermore, the original limited implementation timeframe, given the difficulties in accessing the communities, is a potential concern.

• **Capacity and management**: Odebrecht has been appointed as the engineering and construction managers, while GAMEK, assisted by Coba and Lahmeyer International, retains liability for ensuring overall implementation of the project and will assume management of the project once operational. However, the organisational structure of Angola’s electricity sector is under review and roles and responsibilities for the future operation of the Project are, therefore, uncertain. Odebrecht has a large, competent and suitably resourced ESHS team and it is evident that Odebrecht has the skills and capacity to ensure sustainable ESHS management during construction.

GAMEK’s capacity is difficult to gauge and GAMEK has not yet determined staffing requirements to operate Laúca, making it difficult and perhaps (and unfortunately) premature to implement capacity building and skills transfer programmes. While Odebrecht, Coba and Lahmeyer International are contracted to train people, this is not a substitute for customised capacity building. Here it should be noted that Odebrecht manages projects each requiring dedicated (ESHS) management teams, while GAMEK manages a sector and is likely to require a single, but larger management team, perhaps located at a central point (Luanda) with junior managers deployed at project sites. Capacity building programmes may need to consider developing overarching ESHS policies and procedures applicable to all hydropower projects managed by GAMEK / ENE to facilitate and align future operation of these facilities.

• **Disclosure and public acceptance**: As might be expected in a country which has only in the recent past emerged from a civil war, stakeholder engagement is still a relatively novel concept in Angola. Nevertheless, it is a requirement of GIIP. Consultation compliant with Angolan legislation did occur and a public hearing was convened after submission of the ESIA, but consultation in the ESIA fell short of GIIP. Odebrecht has undertaken two subsequent rounds of consultation with communities and Odebrecht’s community relations and CSR initiatives have
abetted community awareness and acceptance of the Project, retrospectively addressing deficient consultation during the ESIA. A Social Communication Plan for Communities is in draft.

- **Grievance mechanisms**: Grievance mechanisms, both for workers / contractors and external stakeholders, were initiated by Odebrecht in September 2014.

- **Emergency response**: Odebrecht's ERP has been updated to consider possible off-site emergencies related to the project that may affect communities and makes provision for the involvement of local government agencies and communities in the case of an emergency. It is unclear if external resources are adequate to deal with an off-site emergency situation related to the project and how the relevant details of the ERP have been or will be disclosed to external stakeholders.

- **Waste management**: Management of waste in Angola in general is a challenge. Odebrecht has a waste management and disposal system with associated procedures addressing all waste streams generated on site; additional waste recycling contractors are still being identified. During operations, existing facilities should be utilised rather than building new infrastructure, and GAMEK’s CSR programme could consider extending waste disposal services to local communities.

- **Rehabilitation**: Surplus material has been used in multiple locations (e.g. in concrete batching, as fill material etc.). Due to the size of the disturbed area, rehabilitation will require sufficient resources and budget and should be implemented incrementally throughout the construction period. Delayed rehabilitation can increase liabilities and increase exposure to reputational risk.

- **Dam safety**: An independent dam safety assessment has been commissioned and will consider dam failure scenarios (flood waves and extent of inundation). The risk of dam failure is considered low. The draft review identified a number of possible, unresolved technical concerns. Ongoing external quality control is provided by a consortium of Coba and Lahmeyer International who are also present on-site

- **Biodiversity**: Baseline studies were undertaken during the ESIA and further biodiversity monitoring has and will occur. A BAP has not been developed and is recommended to comply with GIIP. The ESIA consultant’s advice that biodiversity offsets are not required (unless MinAmb includes such a condition in the Environmental License) should be further motivated.

- **Cultural heritage**: No heritage study was conducted for the ESIA. The Angolan Ministry of Culture was confirmed as the party responsible for the identification and protection of cultural heritage, and identified cultural resources in the form of stone graves and a cave at Laúca Rock during two site visits. Limited capacity at government agencies is a minor concern in this regard.

Actions and recommendations to achieve compliance with the governance framework have been recorded in an ESAP, which gives practical instruction on the requirements to address key deficiencies in the ESIA, ESHS plans and procedures and their implementation.

SRK will undertake annual reviews for five years to verify implementation of the ESAP.

SRK notes that opportunities may exist to align and/or integrate certain aspects that occur at both Laúca and Cambambe, e.g. compilation and implementation of a Stakeholder Engagement Plan, BAP, waste management system, capacity building and social initiatives. Both facilities will be ultimately managed by the Angolan Government and alignment in programmes, policies and procedures during construction may facilitate the recommended development of an over-arching ESHS programme applicable to all hydropower projects managed by GAMEK / ENE that can be more easily monitored and requires fewer resources.
All data used as source material plus the text, tables, figures, and attachments of this document have been reviewed and prepared in accordance with generally accepted professional engineering and environmental practices.
Appendices
Appendix A: List of Documents Reviewed
List of Documents Provided

Note:
- All documents were provided in Portuguese unless otherwise indicated. An English translation of the document title has been included by SRK for reference.
- Documents annotated with a *** were only provided in hard copy.
- Documents provided during or after the Lender Group site visit are indicated in italics.

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<td>Environmental Impact Assessment for the Laúca Dam Construction Project</td>
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**Solid Waste Management**

| 42 | Solid waste management [REVISED]                         | Gerenciamento de Resíduos Sólidos                                    | PI AHL 25    | 02      | 4 Sep 2014   | Odebrecht|
| 43 | Solid waste management                                    | Gerenciamento de Resíduos Sólidos                                    | PI AHL 25    | 01      | 2 Jan 2014   | Odebrecht|
| 44 | Inventory of solid wastes of the AH Laúca project         | Inventário de resíduos sólidos do projeto AH Laúca                   | PI AHL 25    | 01      | 22 Jul 2014  | Odebrecht|
| 45 | Solid waste management [blank form]                       | Gerenciamento de Resíduos Sólidos                                    | PI AHL 25/1  | 01      |              | Odebrecht|
| 46 | Flowchart of solid waste management process               | Fluxograma do Processo de Gerenciamento Resíduos Sólidos              | PI AHL 25/2  | 00      |              | Odebrecht|
| 49 | Checklist – Environment                                   | Lista de Verificação – Meio Ambiente*                                | PI AHL 25 LV-11 | 00      |              | Odebrecht|
| 50 | Composting of organic wastes                              | Compostagem de Resíduos Orgânicos                                    | PO AHL 15    | 01      | 18 Dec 2013  | Odebrecht|
| 51 | Thermal treatment of hazardous wastes                     | Tratamento Térmico de Resíduos Perigosos                             | PO AHL 74    | 00      | 2 Jan 2014   | Odebrecht|

**Occupational Health and Safety**

| 52 | Working at heights                                       | Trabalho em Altura                                                    | PI AHL 52    | 01      | 2 Jan 2014   | Odebrecht|
| 53 | Task Analysis: Handling cargo with cranes on wheels [not fully legible] | Analise prevencionista da Tarefa (APT) - Movimentação de carga com guindaste sobre rodas | PI DRL 14/1  | 00      | 29 Mar 2014  | Odebrecht|
| 54 | Evaluation of malaria potential [blank form]             | Potencial malarígeno avaliação                                        | -            | -       |              | Odebrecht|
| 55 | Vector Control Program for Communicable Diseases in Laúca Hydroelectrical project | Programa de Controle de Vetores de Doencas Transmissíveis no aproveitamento hidrelectrico de Laúca | -            | -       |              | Odebrecht|
| 56 | Sleeping sickness                                        | Doença do sono                                                        | -            | -       |              | -        |

**Recruitment**

<p>| 57 | Recruitment process flowchart                           | Fluxo do Recrutamento*                                                | -            | -       |              | Odebrecht|
| 58 | Personnel form [blank form]                             | Movimentação de Pessoal*                                              | -            | -       |              | Odebrecht|
| 59 | Documents required for employment                       | Documentos necessários para admissão*                                 | -            | -       |              | Odebrecht|
| 60 | Recruitment form [blank form]                           | Ficha de recrutamento*                                                | -            | -       |              | Odebrecht|
| 61 | Monitoring / Selection of Human Resources [blank form]  | Acompanhamento / Seleção de recursos humanos*                         | -            | -       |              | Odebrecht|
| 62 | Medical report [blank form]                             | Encaminhamento medico*                                                | -            | -       |              | Odebrecht|</p>
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### Document Title (English)
- Memorandum of Understanding between the Ministry of Culture, the Provincial Government of Kwanza-Norte, the Provincial Government of Malanje, GAMEK and Odebrecht Angola regarding the establishment of a partnership in the field of preservation and enhancement of historic and cultural heritage in the Kapanda and Lauca regions.

### Document Title (Portuguese)
- Memorando de entendimento entre o Ministério da Cultura, Governo da Província do Kwanza-Norte, Governo da Província de Malanje, Gabinete de aproveitamento do meado Kwanza e a Odebrecht Angola para o estabelecimento de uma parceria no domínio da preservação e valorização do património histórico e cultural nas regiões de Kapanda e Lauca.

### Other Information
- Team introduction and site visit agenda Presentation
- - - 18 Aug 2014 Odebrecht
- Lauça Hydropower Project Presentation
- - - 19 Aug 2014 Odebrecht
- Social Responsibilities Programme Presentation
- - - 20 Aug 2014 Odebrecht
- Corporate Presentation
- - - 22 Sep 2014 Odebrecht
- Site Visit Presentation
- - - 23 Sep 2014 Odebrecht
- Andritz Lauca Presentation
- - - 23 Sep 2014 Odebrecht
- Social Responsibilities Programme Presentation
- - - 24 Sep 2014 Odebrecht
Appendix B: Site Photographs
Kwanza River upstream of dam wall construction site in August 2014 prior to diversion of the river through the diversion tunnels

Kwanza River upstream of dam wall construction site in September 2014 after diversion of the river through the diversion tunnels

Dam wall construction site (August 2014)

Dam wall construction site (September 2014)
Site accommodation camp and offices

Location of future water outlet at Laúca Rock (August 2014)

Waste management facility: waste storage

Waste management facility: landfill cell
Ngola Ndala village

Clinic refurbished in Ngola Ndala

Community project: Nurseries for landscaping and rehabilitation

Communal water taps installed in Ngola Ndala
Appendix C: Environmental and Social Action Plan
Laúca Hydropower Project (the “Project”) – Environmental and Social Action Plan (“ESAP”)

Definitions:

“Agent” means Deutsche Bank AG

“ESIA” means the environmental impact assessment dated May 2013, prepared by Holísticos – Serviços, Estudos e Consultoria, Lda of Angola and Intertechne Consultores S.A. of Brazil.

“Environmental Consultant” means SRK Consulting (South Africa) (Pty) Limited or such other independent environmental expert as may be appointed from time to time by the Agent to provide certain advice and reports in relation to the compliance of the Project and the Associated Facilities with the ESAP and the Performance Standards and Environmental Guidelines.

“Environmental License” means the environmental license relating to the Project and issued by MinAmb.

“EPC Contract” means the contracts regarding the civil works for the dam wall construction and the procurement, installation and commissioning of electromechanical equipment for the hydroelectric power plant in Laúca.

“EPC Contractor” means the consortium consisting of Construtora Norberto Odebrecht S.A. Sucursal Angola and Odebrecht Angola Projectos e Serviços Lda., and any successor of such consortium or its members under the EPC Contract.

“EMP” means the environmental management plan with respect to the Project and the Associated Facilities.

“MINEA” means the Ministry of Energy and Water of the Republic of Angola (Ministério da Energia e Águas da República de Angola) and any successor of such ministry.

“MinAmb” means the Ministry of Environment of the Republic of Angola (Ministério do Ambiente da República de Angola) and any successor of such ministry.

“Operator” means Gabinete de Aproveitamento do Médio Kwanza (GAMEK), a component body of MINEA existing under the laws of the Republic of Angola, any successor of GAMEK, and any other entity duly designated by MINEA or any other competent public authority in the Republic of Angola to operate the Project and/or the Associated Facilities.

“Performance Standards and Environmental Guidelines” means with respect to the Project and, as applicable, the Associated Facilities: (i) the Performance Standards listed in Schedule 1 herein; (ii) the General Environmental, Health and Safety Guidelines of the World Bank Group; and (iii) the Industry Sector Guidelines specified in Schedule 1 herein, in each case as in effect as of the date the Agent, acting in its sole discretion, confirms the effectiveness of the financing for the Project.

“Power Transmission Lines” means any transmission lines for electricity including poles, substations and other related infrastructure to be installed, enlarged, rehabilitated, relocated and/or operated in connection with the implementation of the Project (excluding any power transmission lines that will be installed under the scope of work of the EPC Contract).

“World Bank Group” means the International Bank for Reconstruction and Development, the International Development Association, the International Finance Corporation and MIGA.
## Environmental and Social Action Plan

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<td></td>
<td>- Changes in the length of adduction tunnels;</td>
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<td>- Location of waste rock storage areas;</td>
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<td>(ii) Additional activities, including:</td>
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<td></td>
<td>- Construction of 25 houses for the Operator;</td>
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<td></td>
<td>- Installation of a 30 kV transmission line from Capanda to Láuca;</td>
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<td>(iii) Aspects not discussed in the ESIA, including:</td>
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<td></td>
<td>- Ecosystem services;</td>
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<td></td>
<td>- Emissions of greenhouse gases, including loss of carbon sequestration and emissions from biodegrading vegetation;</td>
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<td></td>
<td>- Land capability of inundated area and associated opportunity costs.</td>
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<td></td>
<td>Compile an Addendum to the ESIA documenting the environmental assessment and compliant with the Performance Standards and Environmental Guidelines and submit to MinAmb. Revise the EMP and Integrated Sustainability Programme accordingly, consistent with the requirements of the Performance Standards and Environmental Guidelines.</td>
<td></td>
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</tr>
<tr>
<td>2.</td>
<td>Ensure and support completion of the Cumulative Impact Assessment (commissioned by the Cambambe Phase 2 Project) of existing and planned dams on the Kwanza River, especially those impacts related to the series of rapids between the Capanda Reservoir and Cambambe Dam, in compliance with Performance Standard 1. Adjust the EMP accordingly consistent with the requirements of the Performance Standards and Environmental Guidelines.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>To be completed by 1 June 2015</td>
</tr>
<tr>
<td>3.</td>
<td>Ensure that an Environmental and Social Impact Assessment, compliant with the Performance Standards and Environmental Guidelines, is conducted for the Power Transmission Lines and submit the assessment to MinAmb for approval.</td>
<td>MinEA</td>
<td>To be completed prior to construction of the transmission lines</td>
</tr>
<tr>
<td>4.</td>
<td>Obtain the Operation Environmental License for the Láuca Hydropower Project prescribed in terms of Decree No. 59/07 once compliance with all the requirements of the ESIA has been demonstrated.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>To be completed by 2018</td>
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<td></td>
<td><strong>INTEGRATED SUSTAINABILITY PROGRAMME</strong></td>
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<tr>
<td>5.</td>
<td>Ensure that (a) all mitigation measures identified in the ESIA and in the current ESAP, (b) evidence of progress to be provided by 1 December 2014.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>Evidence of progress to be provided by 1 December 2014.</td>
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<tr>
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<tr>
<td>1</td>
<td>the conditions of the Environmental License (and the Technical Report issued by MinAmb on 28 January 2014), and (c) the requirements of the Performance Standards and Environmental Guidelines, are duly integrated into the EPC Contractor’s and the Operator’s policies, plans and procedures relating to environmental and occupational health and safety. Demonstrate integration, e.g. in a Commitments Register.</td>
<td>EPC Contractor to implement and EPC Contractor</td>
<td>2014. To be completed by 1 June 2015.</td>
</tr>
<tr>
<td>6</td>
<td>Provide evidence that items in the Technical Report issued by MinAmb have been resolved, implemented and/or incorporated into the “legal compliance register” maintained by the EPC Contractor.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>Evidence to be provided by 1 December 2014, 1 June 2015 and annually thereafter</td>
</tr>
<tr>
<td>7</td>
<td>Provide evidence that a system for internal review, investigation of non-conformances and amendment of policies and procedures is integrated into the various management procedures of the EPC Contractor’s and the Operator’s management system.</td>
<td>Operator (with the support of the EPC Contractor to implement) and EPC Contractor</td>
<td>To be completed by 1 December 2014</td>
</tr>
<tr>
<td>8</td>
<td>Provide evidence that the EPC Contractor’s and Operator’s Health &amp; Safety, Environment and Social portfolios are sufficiently integrated to identify and effectively manage tasks and programmes that affect more than one portfolio.</td>
<td>EPC Contractor</td>
<td>Evidence to be provided by 1 December 2014, 1 June 2015 and annually thereafter</td>
</tr>
<tr>
<td>9</td>
<td>Provide evidence that an audit of the Project’s compliance with the laws and regulations of the Republic of Angola has been undertaken (to be repeated annually) and that the “legal compliance register” maintained by the EPC Contractor has been revised accordingly to reflect any changes of legislative requirements.</td>
<td>EPC Contractor</td>
<td>Evidence to be provided by 1 December 2014, 1 June 2015 and annually thereafter</td>
</tr>
<tr>
<td>10</td>
<td>Obtain a land mine clearing certificate for the construction area.</td>
<td>EPC Contractor</td>
<td>To be completed by 1 December 2014</td>
</tr>
<tr>
<td>11</td>
<td>Provide a written outline of the anticipated governance structures for the Laúca Hydropower Project.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>To be completed by 1 December 2014</td>
</tr>
<tr>
<td>12</td>
<td>In addition to planned training, provide evidence of a capacity assessment and customised capacity building and skills transfer programme for the Operator, focusing on environmental, health and safety standards.</td>
<td>EPC Contractor</td>
<td>Evidence to be provided by 1 June 2015</td>
</tr>
<tr>
<td>13</td>
<td>Review and assess Operator’s capacity to manage environmental, social and health issues and report on the implementation of the capacity building programme and training programme.</td>
<td>EPC Contractor</td>
<td>Details to be provided by 1 December 2015 and annually thereafter until three years after the commissioning of the Project</td>
</tr>
<tr>
<td>14</td>
<td>Provide evidence that the capacity and experience of the consultant appointed to compile the Resettlement Action Plan and the scope and timeframe for completion of the Resettlement Action Plan are adequate, failing which an appropriately qualified consultant and/or peer reviewer should be appointed and/or the Resettlement Action Plan timeframe</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>To be completed by 1 December 2014</td>
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<tr>
<td>15.</td>
<td>Inform stakeholders as soon as reasonably practicable of the boundaries of the inundated area and cut-off date for determining displacement.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>Evidence of progress by 1 December 2014</td>
</tr>
<tr>
<td>16.</td>
<td>Develop a compensation strategy.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>Evidence of progress by 1 June 2015 To be completed by 1 December 2015</td>
</tr>
<tr>
<td>17.</td>
<td>Prepare a Resettlement Action Plan consistent with Performance Standard 5.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>Version 1 of RAP to be completed by 1 June 2015 RAP to be completed by 1 June 2016</td>
</tr>
<tr>
<td>18.</td>
<td>Prepare a report consistent with the requirements of the Performance Standards and Environmental Guidelines on the completion of the resettlement and/or compensation in compliance with the requirements of Performance Standard 5.</td>
<td>EPC Contractor</td>
<td>To be completed by 1 December 2016</td>
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**DISCLOSURE AND PUBLIC ACCEPTANCE**

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<tr>
<td>19.</td>
<td>Formalise, disclose and implement a grievance mechanism for external stakeholders.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>To be completed by 1 December 2014</td>
</tr>
<tr>
<td>20.</td>
<td>Finalise and implement the Social Communication Plan for Communities for the construction phase of the Project consistent with the requirements of the Performance Standards and Environmental Guidelines. The benefit sharing mechanisms of the EPC Contractor, e.g. social support programmes, education and environmental awareness, are to be included in the Social Communication Plan for Communities.</td>
<td>EPC Contractor</td>
<td>To be completed by 1 December 2014</td>
</tr>
<tr>
<td>21.</td>
<td>Finalise the Social Communication Plan for Communities for the operation phase of the Project consistent with the requirements of the Performance Standards and Environmental Guidelines. Any benefit sharing mechanisms of the Operator are to be included in the Social Communication Plan for Communities.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>To be completed by 1 December 2016</td>
</tr>
<tr>
<td>22.</td>
<td>Incorporate a procedure in the EPC Contractor's Integrated Sustainability Programme describing how material changes (if any) to the Project are assessed and disclosed to stakeholders and authorities.</td>
<td>EPC Contractor</td>
<td>To be completed by 1 December 2014</td>
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**LABOUR POLICY**

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<tr>
<td>23.</td>
<td>Provide evidence that the EPC Contractor and its sub-contractors comply with the requirement to make employees aware of their rights and protections under applicable labour laws.</td>
<td>EPC Contractor</td>
<td>Evidence to be provided by 1 December 2014, 1 June 2015 and annually thereafter until the commissioning of the Project</td>
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**WASTE AND POLLUTION MANAGEMENT**

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<tr>
<td>24.</td>
<td>Provide evidence that key waste contractors have the necessary permits and facilities to</td>
<td>EPC Contractor</td>
<td>Evidence to be provided by 1 December 2014, 1 June 2015 and annually thereafter until the commissioning of the Project</td>
</tr>
<tr>
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<tr>
<td>25.</td>
<td>Provide evidence that atmospheric emissions from the incinerator are monitored.</td>
<td>EPC Contractor</td>
<td>Evidence of calibration and monitoring programme to be provided by 1 December 2014. Monitoring data to be provided by 1 June 2015 and annually thereafter</td>
</tr>
<tr>
<td>26.</td>
<td>Clarity the scope, purpose and timeframe of the proposed hydrological modelling.</td>
<td>EPC Contractor</td>
<td>To be completed by 1 June 2015</td>
</tr>
<tr>
<td>27.</td>
<td>Provide results of the carbon inventory for the Laúca site and estimate greenhouse gas emissions for the Project. Review opportunities for reducing greenhouse gas emissions and using renewable energy sources for Project facilities.</td>
<td>EPC Contractor</td>
<td>To be completed by 1 June 2015</td>
</tr>
<tr>
<td>28.</td>
<td>Compile a revised construction phase Emergency Response Plan (including emergency response assistance to surrounding villages for emergency situations associated with the Project during the construction phase) consistent with the Performance Standards and Environmental Guidelines after consultation with relevant stakeholders (including public authorities and local communities) and communicate such revised procedures to potentially affected stakeholders.</td>
<td>EPC Contractor</td>
<td>Updated ERP to be completed by 1 December 2014 Evidence of communication to internal and external stakeholders to be provided by 1 June 2015</td>
</tr>
<tr>
<td>29.</td>
<td>Compile an operations phase Emergency Response Plan (including response procedures regarding dam failure) consistent with the Performance Standards and Environmental Guidelines after consultation with relevant stakeholders (including public authorities and local communities) and communicate such revised procedures to potentially affected stakeholders.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>To be completed by 1 December 2016</td>
</tr>
<tr>
<td>30.</td>
<td>Request the ESIA consultant to consider GIIP and submit a motivation explaining why biodiversity offsets are not considered necessary, irrespective of MinAmb’s recommendations in this regard.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>Provide evidence by 1 December 2014</td>
</tr>
<tr>
<td>31.</td>
<td>Prepare a Biodiversity Action Plan consistent with the requirements of the Performance Standards and Environmental Guidelines, including measures to protect species included in the “red list” of threatened species of the International Union for Conservation of Nature (IUCN) and a more detailed assessment of provisioning ecosystem services from a livelihoods perspective.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>To be completed by 1 June 2015</td>
</tr>
<tr>
<td>32.</td>
<td>Finalise the independent review of dam safety, including dam failure.</td>
<td>Guarantee holder (Deutsche Bank)</td>
<td>To be completed by 1 December 2014</td>
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**EMERGENCY RESPONSE**

- **28.** Compile a revised construction phase Emergency Response Plan (including emergency response assistance to surrounding villages for emergency situations associated with the Project during the construction phase) consistent with the Performance Standards and Environmental Guidelines after consultation with relevant stakeholders (including public authorities and local communities) and communicate such revised procedures to potentially affected stakeholders.  
  - **Responsibility:** EPC Contractor  
  - **Schedule:** Updated ERP to be completed by 1 December 2014 Evidence of communication to internal and external stakeholders to be provided by 1 June 2015

- **29.** Compile an operations phase Emergency Response Plan (including response procedures regarding dam failure) consistent with the Performance Standards and Environmental Guidelines after consultation with relevant stakeholders (including public authorities and local communities) and communicate such revised procedures to potentially affected stakeholders.  
  - **Responsibility:** Operator (with the support of the EPC Contractor to implement)  
  - **Schedule:** To be completed by 1 December 2016

**BIODIVERSITY**

- **30.** Request the ESIA consultant to consider GIIP and submit a motivation explaining why biodiversity offsets are not considered necessary, irrespective of MinAmb’s recommendations in this regard.  
  - **Responsibility:** Operator (with the support of the EPC Contractor to implement)  
  - **Schedule:** Provide evidence by 1 December 2014

- **31.** Prepare a Biodiversity Action Plan consistent with the requirements of the Performance Standards and Environmental Guidelines, including measures to protect species included in the “red list” of threatened species of the International Union for Conservation of Nature (IUCN) and a more detailed assessment of provisioning ecosystem services from a livelihoods perspective.  
  - **Responsibility:** Operator (with the support of the EPC Contractor to implement)  
  - **Schedule:** To be completed by 1 June 2015

**DAM SAFETY**

- **32.** Finalise the independent review of dam safety, including dam failure.  
  - **Responsibility:** Guarantee holder (Deutsche Bank)  
  - **Schedule:** To be completed by 1 December 2014
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<tr>
<td>33.</td>
<td>Resolve any concerns raised by the dam safety review.</td>
<td>Operator (with the support of the EPC Contractor to implement)</td>
<td>To be completed by 1 December 2014</td>
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