

## Environmental and Social Review Summary

### 1. General Information and Overview of Scope of IDB Invest's Review

Klabin ("the Client") is the largest paper producer, exporter and recycler in Brazil. The company has 17 industrial units in Brazil and one in Argentina, including forest management unit located in Paraná, Santa Catarina and São Paulo, Brazil. With partial IDB financing Klabin constructed a complete greenfield cellulose pulp mill with bleached hardwood and softwood lines in the municipality of Ortigueira, state of Paraná, which started operations in March 2016 and reached 100% physical progress (project completion) in September 2016. Full design production was achieved in September 2017 and the current manufacturing capacity is 1,578,000 metric tons per year (t/year) of hardwood pulp and softwood (fluff) pulp. The existing plant is now referred to as the PUMA I project.

The PUMA II/Klabin project ("the Project" or "PUMA II") consists of an expansion of the PUMA I project, on the same site, with the addition of two pulp integrated paper machines (kraftliner) and associated fiberlines. The expansion is divided into two phases. Phase 1 will increase PUMA I's capacity from 1,578,000 to 1,598,000 t/year and produce an additional 450,000 tons of kraftliner paper on a new machine (called PM 27). Pulp for the new paper machine will be supplied through a new fiberline, bringing total site production to 2,048,000 t/year. Phase 2 will add another fiberline and an additional kraftliner machine (PM 28), with 475,000 ADt/year capacity, bringing total site production to 2,523,000 ADt/year.

In addition to a new fiberline and paper machine, Phase 1 will also include the following components: i) expansion of 66,000 m<sup>2</sup> of the wood storage area; ii) preparation line for wood and a new chip pile; iii) brown fiber line for short fiber with a capacity of 2,000 ADt/day; iv) recovery boiler with a capacity of 3,300 tss/day (total suspended solids); v) evaporation system with a capacity of 1,200 t/h; vi) lime kiln with a capacity of 450 t/d; vii) causticizing system with a capacity of 5,000 m<sup>3</sup>/day; viii) biomass boiler with a capacity of 220 t/h of steam; ix) turbo generator with a capacity of 145.5 MW; x) boiler water treatment plant line with capacity of 1,000 m<sup>3</sup>/h; xi) expansion at the water treatment plant (2,500 m<sup>3</sup>/h) and effluent treatment plant (2,100 m<sup>3</sup>/h); xii) installation of support building - storeroom, roll storage, among others; and xiii) installation of auxiliary equipment. Phase 1 completion is scheduled for 2021 and phase 2 for 2023. Klabin will continue to produce bleached pulp (short fiber, long fiber and fluff) at the Puma I and will continue to supply both domestic and international markets with an annual output capacity of 1.6 million tons of bleached pulp. The combined site will be run as a single production unit, with common management, maintenance and operations.

The Environmental and Social Due Diligence (ESDD), performed by IDB Invest with the help of the consulting firm Arcadis included a visit<sup>[1]</sup> to the existing PUMA I facilities (pulp mill and associated infrastructure, forest plantations, communities, local government), as well as future siting of new infrastructure for PUMA II within the PUMA I facility. As part of the ESSD, IDB Invest reviewed PUMA II environmental impact assessment (RAP, in its Portuguese acronym), the company's Environmental, Social, and Health & Safety Management System (ESMS), Klabin's Environmental & Social (E&S) compliance Reports submitted for the PUMA I project, monitoring reports produced regularly by the consultancy firm Arcadis ( the Independent Environmental & Social Consultant-IESC), and ongoing and planned stakeholder engagement activities.

### 2. Environmental and Social Categorization and Rationale

The Project has been classified as a Category B project, pursuant to the IDB Invest Environmental and Social Sustainability Policy. The key potential negative environmental, social, health and safety

risks and impacts associated with the construction phase of the Project are transient in nature and of a moderate magnitude, whereas key risks and impacts during the operations phase are similar in nature and scale as those of the PUMA I existing facility - with the exception of risks relating to land acquisition given the need to expand the forest base. Key construction and operations risks are identified in section 4.1.c.i, below. The Project has triggered the following Performance Standards (PS): i) PS-1: Assessment and Management of Environmental and Social Risks and Impacts; ii) PS-2: Labor and Working Conditions; iii) PS-3: Resource Efficiency and Pollution Prevention; iv) PS-4: Community Health, Safety and Security; v) PS-6: Biodiversity Conservation and Sustainable Management of Living Natural Resources; and vi) PS-7: Indigenous Peoples.

### **3. Environmental and Social Context**

The PUMA II expansion will take place within the existing industrial (i.e. brownfield) facility of PUMA I pulp mill and, as such, no additional industrial land will be required for the construction of PUMA II. In contrast, to meet the demand of wood from PUMA II, Klabin will have to increase its net forest base in a six-year timeframe and, thus, it has already started the prospection of available pasture or degraded land in a 150 km radius from the pulp mill using remote sensing. Currently, Klabin owns or leases 361,000 ha in the state of Parana: 200,000 ha are dedicated to eucalyptus and pine plantations, and 161,000 ha are dedicated to permanent set-asides of protected native habitat.

### **4. Environmental Risks and Impacts and Proposed Mitigation and Compensation Measures**

#### **4.1. Assessment and Management of Environmental and Social Risks**

##### *4.1.a. E&S Assessment and Management System*

Klabin has a comprehensive ESMS, which is currently in place as part of its ongoing operations. This has been developed and enhanced iteratively over the years, with independent oversight since 2015. Klabin will adapt this underlying framework to Puma II, which will require some additional adjustments moving forward - including the incorporation of lessons learned from PUMA I.

##### *4.1.b. Policy*

Klabin has a corporate Sustainability Policy which implementation is overseen by its Sustainability Committee comprised by five Directors with executive functions and supported by Klabin's Corporate Sustainability and Environmental Manager. The committee is regularly informed of the Project's environmental and social performance in a quarterly form and whenever considered necessary. Klabin has obtained multiple environmental and social certifications: All forestry management units are FSC[2] certified and pulp mill facilities are ISO 14001 and OSHAS 18001 certified. Klabin's Sustainability Policy is communicated to all staff at all levels, including subcontracted employees[3].

##### *4.1.c. Identification of Risks and Impacts*

- 4.1.c.1. Direct and indirect impacts and risks

For Puma I, Klabin conducted a detailed environmental and social impact assessment (*Estudo Prévio de Impacto Ambiental*, in Portuguese). As Puma II involves only an expansion of Puma I, the state of Paraná environmental authority (*Instituto Ambiental do Paraná - IAP*) requested a simplified environmental and social impact assessment (*Relatorio Ambiental Preliminar -RAP*, in Portuguese).

The assessment of potential environmental and social risks and impacts for the PUMA II expansion project is presented in the RAP (September 2018), as well as through the independent E&S due

diligence process conducted by the consultancy firm Arcadis.

The key negative environmental, social, occupational health and safety risks and impacts associated with the construction phase of the Project are related to: i) influx of temporary workers; ii) increase in traffic on local roadways generated by construction vehicles; iii) atmospheric and dust emissions; iv) generation of noise; v) generation of wastewater and solid wastes; viii) generation/handling of hazardous waste; ix) insufficient capacity of municipalities to absorb and manage the additional pressure on social and physical infrastructure; and x) presence of indigenous communities in the Project's area of indirect influence.

During the operations phase, the key negative risks and impacts relate to: i) conversion of modified natural habitat for establishment of plantation forests; ii) incremental increase of atmospheric, water and solid waste emissions; iii) increase in traffic on local roadways generated by vehicles transporting timber and supplies; iv) expectations from the communities in terms of continuing employment, and from municipalities for continued support by the company; and v) lack of urban planning to guide the induction of urban sprawl associated with the expanded plant and lack of municipal capacity to manage a rapidly changing socioeconomic environment.

According to the independent E&S monitoring of PUMA I, all pending items related to risk management have been adequately addressed. For PUMA II, Klabin proposes to continually develop its risk assessment procedures and to improve upon the assessments made for Puma I. To this end, risk assessment methodologies and calculations for costs associated with mitigation have been updated, and risks associated with contractors and third-party suppliers will also be given due consideration moving forward. At the corporate level, an increasing number of risk assessment items are beginning to be given a higher priority.

- 4.1.c.2. Cumulative impact analysis

As part of RAP and licensing process for Puma II, Klabin commissioned a cumulative impact assessment (CIA) involving noise and air quality (including present and future emissions from recovery boilers, biomass boilers and lime kilns in the plant units of Monte Alegre, Puma I and Puma II combined). Cumulative effects on water quality had already been assessed as part of PUMA I. For the air quality component of the CIA, meteorological data was obtained from a meteorological station located in the municipality of Ventania, 35km away from Monte Alegre, and preprocessed with the AERMET model. The air dispersion model used was AERMOD. The air dispersion model estimates maximum ambient concentration of air pollutants (CO, NO<sub>x</sub>, TSP, SO<sub>x</sub>, TRS), and concentration of air pollutants in 13 sensitive receptors.

Modeled ambient air quality was found to comply with air quality standards established in the CONAMA 03/1990 regulation. In November 2018, CONAMA revised the standards including interim and final targets mirroring the 2005 WHO Air Quality Guidelines (CONAMA 491/2018). Modeled ambient air quality has been found to also comply with the updated regulation. The modelling study did not include individual concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> but instead of total suspended particles (TSP), as PM<sub>10</sub> and PM<sub>2.5</sub> were not regulated under the previous CONAMA 03/1990 regulation. However, modeled TSP concentrations, which do include PM<sub>10</sub> and PM<sub>2.5</sub>, are well below the PM<sub>2.5</sub> limits.

As part of the Project's E&S Action Plan (ESAP), Klabin will revise its CIA to include an update of the air dispersion modelling and of the noise impact assessment (to include a traffic component and a new acoustic baseline), as well as to include results of the water quality monitoring programs to reflect relative contributions of both Monte Alegre and PUMA facilities to the Tibagi river.

- 4.1.c.3. Climate and weather induced risks

The climate in Parana is optimal for fast-growth forestry. According to Klabin, climate change projections for the area show increasing temperatures and decreasing rainfall patterns. The rainfall is estimated to decrease by 153 mm/year from 1980-2010's average and mean temperature is expected to increase by 2.8°C from 1980-2010's average by the 2030's. To adapt to climate change, Klabin is researching new varieties of pine and eucalyptus better adapted to warmer climates.

Historically, fires have not been a problem to Klabin. In the last decade, a total of 1,888 hectares have been affected but only 80 hectares of plantations were lost to fires. However, the increase in temperature and decrease in precipitation can increase the risks of fires. Klabin has trained almost 600 people to combat fires and has adequate firefighting equipment, including watchtowers, fire trucks, etc.

- 4.1.c.4. Analysis of alternatives

The Project's environmental impact assessment (RAP) contains a brief consideration of alternate locations for the two new paper machines, including siting options where other, existing Klabin plant sites were considered. Criteria for analysis of alternatives have included wood sourcing options (location of available plantations/land), input sourcing (e.g. process water), as well as destination of process streams (e.g. effluents, solid waste, hazardous wastes, and other plant integration processes). Taken together, these have resulted in the least environmentally impactful option of siting PUMA II within the existing PUMA I facilities. Therefore, all process related expansion will be done within the existing plant complex.

#### 4.1.d. Management Programs

Klabin is heavily engaged in the adoption of BAT (Best Available Technologies) and BPEM (Best Environmental Management Practices), aiming to reduce air emissions, liquid effluents, noise and solid waste generated by the industrial processes. The new plant expansion will be equipped with the latest generation of equipment and will continue to be highly efficient. Klabin regularly monitors both air quality and water quality (of the Tibagi River) for its existing plants at Telemaco Borba (Monte Alegre) and Ortigueira (PUMA I) as part of its environmental commitments and permitting obligations. The existing plant at Ortigueira has been supervised by an independent E&S consultant team (Arcadis) with periodic progress monitoring reports to IDB Invest, which have to date verified Klabin's adequate management of the key risks.

Klabin has prepared an environmental and social management plan (*Plano de Controle Ambiental-PCA*, in Portuguese) as part of the RAP, which details the programs to be implemented during construction and operation. The core E&S management programs to be implemented through the PCA during PUMA II operations are those already implemented for Puma I, whose scope will be expanded to include Puma II once the new production lines start operating. The E&S programs for PUMA II will include the management of waste, wastewater, noise, air emissions, erosion control, health and safety, social communication, environmental education, hiring/training/demobilization, and environmental auditing.

#### 4.1.e. Organizational Capacity and Competency

Klabin has established a core organizational structure with roles definition, responsibilities, and authority to implement the ESMS. Puma I has qualified environmental, social and occupational health and safety (ESHS) teams, comprised of staff experienced with Klabin's organizational structure, as well as new members, and is in the process of expanding their numbers. The Puma II

ESHS team will have the advantage of learning from Puma I staff, and there already is a well-developed handover process in place, with transfers of document ownership, joint site walk-throughs, etc. Hence, the Puma II Project will have the advantage of drawing from the expertise of many of the same personnel who were involved with the Puma I project, which includes senior operations and safety management personnel.

#### *4.1.f. Emergency Preparedness and Response*

In a similar fashion to PUMA I, the Project will be adequately resourced with emergency response personnel (e.g. fire brigade, ambulance, etc). Klabin has an Emergency Response Plan (ERP) for PUMA. However, the organizational response structure depicted in the existing PUMA I plant ERP needs to be better defined with assigned resources, responsible personnel identified, and approach/periodicity established for conducting emergency drills, amongst others. Also, for the operations phase Klabin will need to update its ERP to account for combined PUMA I and II operations.

For workers' accommodations, Klabin will implement fire emergency prevention and response plans to ensure workers can safely evacuate in the event of fire<sup>[4]</sup>.

#### *4.1.g. Monitoring and Review*

EDP's ESMS will include management plans and procedures that define the operating criteria and the mitigating measures and controls to manage the ESHS risks identified in the ESIA and the ESDD process. The Project will track its E&S performance through several mechanisms, including internal inspections and audits in comparison to a set of key performance indicators (KPIs). The ESHS team will review the monitoring and measurement results at least once per month to evaluate the efficiency of the proposed mitigation measures, assess compliance with ESHS legal requirements, and verify the effectiveness of the ESMS processes allowing the identification of potential deviations. Klabin will also regularly submit Environmental & Social Compliance Reports (ESCR) during construction and operations.

The Project's lenders E&S teams will conduct regular supervision site visits during construction and operation. IAP also conducts unannounced inspection visits to verify Project compliance with the environmental permit and progress in implementation of the mitigation programs part of the PBA and PBAI. Also, an E&S consultant firm will be also engaged to provide independent oversight.

#### *4.1.h. Stakeholder Engagement*

Klabin's Stakeholder Engagement Policy (which includes the Engagement Plan, Code of Conduct, Socio-environmental Demand Management, Sustainability Policy, Affected Families Map, Affected Families Worksheet, Matrix of Topics, Materiality Matrix and Integration), presents a consistent and adequate toolset for managing the relationship with the different interest groups involved in the Project, whether they are 'internal' or 'external' to both PUMA I and II.

- 4.1.h.1. Disclosure of Information and informed consultation

Klabin has conducted inclusive project disclosure and public consultation activities as part of requirements of the environmental licensing process for PUMA I and II projects. These activities are ongoing, and key stakeholders engaged have included local communities, landowners, municipal governments, federal government (e.g. National Indigenous Peoples Foundation - FUNAI), local businesses, non-governmental organizations and labor unions.

Klabin has a competent social team in charge of community relations and communications in the

Project's broad geography (i.e. areas of direct and indirect influence). The workload of this team will significantly increase in the following years as a result of construction of PUMA II, due to its multiple responsibilities, among them: i) communication and stakeholder engagement; ii) monitoring of socio-economic impacts during construction of Puma II; iii) support to land acquisition transactions - which will average 15 thousand hectares per year; iv) engagement with a larger number of communities before the transit of logging trucks as the average transportation distance is expected to increase; and v) implementation of the indigenous people plan (PBAI)[5]. Klabin will conduct an analysis of the workload of the social team in the next five years and ensure the team is adequately staffed.

#### *4.1.i. External Communication and Grievance Mechanisms*

The dissemination of assessment and consultation information by Klabin to affected communities has been conducted in a timely and culturally appropriate manner, both in the relationship with indigenous communities and in the operational processes of forest management. The procedures related to the needs of guaranteeing dialogue through free, prior, informed, culturally appropriate and bona fide consultation are incorporated into the company's operational norms. The Client maintains different instruments to receive and facilitate the resolution of the concerns and complaints of the affected communities regarding the environmental and social performance which are organized in the document titled 'Socio-environmental Demand Management'.

Klabin's main grievance channels are called "*Fale com a Klabin (Speak to Klabin)*" and include a dedicated email address ([faleklabinpr@klabin.com.br](mailto:faleklabinpr@klabin.com.br)), a 24hr hotline (tel: 0800 728 0607), suggestion boxes all over the facilities, as well as social team members' direct cellphone numbers (via the application WhatsApp). Klabin has a detailed tracking of the typology of grievances and suggestions. The most common complaints received so far are connected to dust generation and maintenance of unpaved roads.

#### *4.1.j. Ongoing Reporting to Affected Communities*

The stakeholder engagement tools listed in section 4.1.h above presents the framework for stakeholders' participation, including the methods of participation and the information to be shared according to the different interest groups. These tools also contemplate reporting back to the affected communities regarding the implementation of the Grievance Mechanism.

## **4.2. Labor and Working Conditions**

### *4.2.a. Working Conditions and Management of Worker Relationships*

- 4.2.a.1. Human Resources Policies and Procedures

Klabin has a comprehensive Human Resources Policy (*Política de Direitos Fundamentais nas Relações de Trabalho - 2018*), that includes both direct employees and contractors, with an associated sophisticated human resources management system that has proven to be capable of developing appropriate policies, procedures and tools to fulfill the requirements of PS-2.

- 4.2.a.2. Working Conditions and Terms of Employment

The Project is and most likely will continue to be the largest employer in the region (Ortigueira city and all surrounding cities). So far it has 14,746 permanent employees, most of which are attached to the forestry operations, and is estimated to reach 16,246 by the end of 2023.

Klabin will apply the same successful approach used for PUMA I for managing the construction

workforce. As part of its human capital strategy, the Client has developed an action plan aimed at minimizing any worker dissatisfactions that may negatively impact the Project. The plan includes: i) elaboration of a 'Normative for Project Implementation Management'; ii) early negotiations with labor unions; iii) equalization of the minimum wage of each worker category across contractors; iv) provision of quality food, with a high protein load, to the satisfaction of the workforce; v) provision of fully furnished worker accommodation (limited to 3,500 beds), strategically distributed in different locations; vi) promoting leisure/social activities (such as sports championships on weekends); and vii) performance evaluation of service providers, with pre-established criteria (safety, quality, document management, environmental management, etc.).

Issues related to working conditions and terms of employment are documented in the Collective Agreements, valid for all directly hired workers and those of contractors. The terms are endorsed by trade unions and are included in the corresponding "Management Regulation"[\[6\]](#). It is important to note that, although the current national labor legislation allows certain working conditions to be relaxed through collective bargaining agreements, the company has aptly opted to maintain the existing labor guarantees (such as an indefinite contract and a regular working day), ensuring a good relationship with workers and unions.

Workers will be lodged in four existing camps, one in Telemaco Borba and three in Ortigueira. The camps were built for the construction of PUMA I and are currently being refurbished. Each camp can host about 1,500 workers for a total of 6,000 workers. Additional workers will be hosted in hotels and residences in Telemaco Borba and Ortigueira. Only male workers will be lodged in the camps; female workers will be lodged in shared housing. Accommodations comply with ILO guiding principles for workers' housing and a maximum of three workers will share a room. Sport facilities, entertainment rooms, and WIFI will be accessible for free to all workers. No visits will be allowed in the accommodations, but workers' freedom of movement will not be restricted. Accommodations will be cleaned daily and linen/towels will be changed weekly.

- 4.2.a.3. Workers' Organizations

Klabin allows workers to form and freely join labor union without retaliation or discrimination. In fact, most of the workers of contractors are affiliated to labor unions. According to the Management Regulation document, both the company and contractors must possess professionals for labor and union relations to support administrative teams in the construction sites. These professionals will work with contracted partners and their subcontractors to reduce and eliminate irregularities.

- 4.2.a.4. Non-discrimination and Equal Opportunity

The Project's human resources policies and regulations –and especially the Management Regulation– explicitly refer to equality of opportunities and no discrimination. Klabin will replicate the successful model of PUMA I and develop negotiated collective agreements, that in some respects are more advantageous than the national labor legislation.

- 4.2.a.5. Retrenchment

The Management Regulation has provisions to avoid any significant retrenchment issues. There were no retrenchment issues as a result of demobilization of PUMA I workforce, and hence none are expected for PUMA II.

- 4.2.a.6. Grievance Mechanism

In addition to Klabin's Ombudsfuction, contracted workers for Puma II will be able to present confidential and anonymous complaints through suggestion boxes (*canal do trabalhador*) and union

representatives. Companies with more than 250 employees are required by law to hire social workers to attend to the psychosocial needs of workers and maintain good organizational climate. Klabin will also maintain regular meetings with workers' representatives (*roda de conversa*) to ensure proactive communication.

Klabin's induction training for Puma II includes the prohibition of sexual harassment but related procedures are still missing. The Project will develop disciplinary procedures and procedures to respond and investigate sexual harassment and gender-based violence (GBV) complaints. Procedures will be communicated to contractors for adoption (see section 4.4.a.iii), and relevant content will be integrated into mandatory training for workers and management. Klabin will assign a team of qualified individuals to handle sexual harassment and GBV complaints using a survivor-centered approach and ensuring confidentiality.

#### *4.2.b. Protecting the Workforce*

The Project expects to maintain about 5,500 contract workers during the 48 months scheduled for Phases I and II, with a peak in mid-2020 of about 9,000 workers mobilized. In order to meet a considerable challenge in terms of managing a very large temporary workforce, Klabin has developed a comprehensive and complex "Human Capital Management Strategy" that includes human, health and safety management. As part of this strategy, planning and management for the entire workforce for Puma II is consolidated in the 'Normative for Project Implementation Management' that defines standards, policies and procedures for the management of administrative and human capital that also involves companies contracted and subcontracted. Failure to comply with HR regulations will result in contractually allowed penalties which include, for the most serious cases, the suspension of the contract.

- 4.2.b.1. Child Labor

The E&S due diligence process did not detect any child labor.

- 4.2.b.2. Forced Labor

The E&S due diligence process did not detect any forced labor.

#### *4.2.c. Occupational Health and Safety*

There should be several carry-over benefits from the Puma I project available to Puma II. Some of these include: i) availability of senior construction management personnel, which includes a dedicated safety management contractor to provide oversight to all the EPC contractors; ii) analysis and implementation of the lessons learned from the recorded deviations; iii) the ability to preferentially hire the best people from the construction workforce; iv) technical expertise in safety, environment, occupational health, social assistance, and emergency response; and v) the ability to hire known specialty companies. Klabin has a comprehensive and 18001 Certified OHS Management System.

#### *4.2.d. Workers Engaged by Third Parties*

Contractors responsible for construction of PUMA II are contractually required to hire their own ESHS personnel and adhere to relevant policies, procedures and plans as contained in Klabin's ESHS guidance manuals - which are annexed to EPC contracts. This ensures that relevant parts of the company's human resources policies and procedures are extended to cover the labor practices of contractors and sub-contractors (e.g compliance with local laws, non-discrimination, provisions to ensure timely payment of salaries, no child and forced labor, occupational health and safety plans



and procedures, etc.), and that labor conditions follow the agreed upon collective labor agreements as well as national Brazilian labor law and regulations.

During construction of PUMA II, the environmental and social performance of contractors will be monitored by an independent company (TRIADD) which will regularly report to Klabin. Monitoring will include regularly scheduled and un-scheduled audits, review of the EPC contractor internal monitoring reports and documentation, as well as review of grievance logged by contractors and subcontractor's employees. There is a points system for rewarding good and penalizing bad ESHS performance, which for the latter translates into a percent discount on invoiced payments due.

### **4.3. Resource Efficiency and Pollution Prevention**

#### *4.3.a. Resource Efficiency*

Klabin produces excess renewable energy in the form of electricity as a result of its industrial processes. The combine mill will export 93 MW (or about 29% of total generation). An interesting feature of PUMA II is the inclusion of a biomass gasifier to provide fuel for the lime kiln and a tall oil plant. Combined, these will help increase the use of renewable fuels - with a net increase use from 93 to 96% for the combined PUMA I and II operations.

- 4.3.a.1. Greenhouse Gases

The GHG generation during the construction period is considered short term and not significant. During operations, the Project will be a net Carbon sink because of plantation forest growth, and the estimated Carbon balance of PUMA I and II combined is approximately 1.6 million tons CO<sub>2</sub>eq/year.

- 4.3.a.2. Water Consumption

Water use for the construction of the Project is not considered significant and will be required for dust control during dry season, cleaning of work areas, preparation of concrete and cement mixtures, and other temporary uses. Bottled water will be supplied for human consumption. Portable toilets to be used will require no water. For operations, IAP granted a permit for the extraction of water from the Tibagi river at a rate of 8,400 m<sup>3</sup>/h (201,600 m<sup>3</sup>/day) valid until 2026<sup>[7]</sup>. The water extraction permit covers both PUMA I and PUMA II.

#### *4.3.b. Pollution Prevention*

PUMA I was completed in the first quarter of 2016. Currently, the unit produces 1.5 million tons of bleached kraft pulp. PUMA I and II have been designed to meet EU BAT 2001<sup>[8]</sup> for pulp and paper, thereby minimizing its footprint through pollution prevention and abatement strategies. According to the IESC, overall Klabin has designed a very efficient mill expansion, as it: i) uses wood sparingly (has good yield) for the product made; ii) minimizes chemical consumption; iii) has low water use and effluent generation; iv) is very energy efficient for both power and steam use; v) has extensive collection of vent gases from equipment and tanks vents; and vi) is a much more eco-efficient mill than those mills which provided the technology basis for both IFC 2007 and EU BAT 2001.

- 4.3.b.1. Wastes

The increase in volume of industrial wastes brought about by PUMA II has been estimated in the RAP study, and the mean average increase will be 84%. Klabin has an extensive system for beneficial reuse of process solid wastes such as sludges, dregs and boiler ash (currently, 83% of the waste is recycled). Wood wastes are burnt in a power boiler for green energy production. Most of the non-recyclable waste is sludge from the tertiary wastewater treatment system, which due to its high

content in aluminum cannot totally be used as compost (nonetheless, approximately 50% of it is composted). Alternatives to the use of aluminum as flocculant in wastewater treatment are being analyzed to reduce the amount of non-recyclable waste. Even so, according to the independent E&S consultant report production of non-recyclable waste is well below that of the BAT standards (30-70 kg/ton; PUMA II project: 4.4 kg/ton).

Waste inside PUMA's facilities is managed by a specialized waste management company. In 2018, PUMA generated 177,000 tons of non-hazardous waste and 75 tons of hazardous waste. Non-recyclable non-hazardous waste is disposed of in a permitted landfill facility inside Klabin's property.

Also, according to the IESC, Klabin's solid waste management system has improved significantly 2015 as part of Puma I. For PUMA II, the waste management database (*Plataforma Verde*) will be adapted to improve solid waste management assessments, and a new waste management plan is being developed to incorporate all recommendations from Puma II.

- 4.3.b.2. Hazardous Materials Management

No significant quantities of hazardous materials are expected to be used during construction of PUMA II. Work fronts will be provided with appropriate containment bays around sites to control any potential spillage and avoid contamination of ground water.

During operation, non-recyclable hazardous waste consists mostly of contaminated personal protection equipment, waste contaminated with lubricants/used oils, and medical waste. These wastes are disposed of in permitted industrial landfill facilities managed by the same specialized waste management company. Hazardous wastes such as used oils, lamps, batteries are also recycled by specialized companies.

PUMA I has management plans to handle hazardous materials, which will be expanded to include Puma II. For PUMA II, the company will identify all hazardous materials as part of a 'master' map identifying 'hotspots' and this info should be shared with internal (and external, if applicable) agencies in case of accidents (spills, fire, etc.). The integration between PUMA I and II will be confirmed as the Project is developed.

- 4.3.b.2.a. Pesticides

Klabin uses remote sensing (private satellites) and drones to monitor its entire forest plantations every 15 days and identify the areas that require weeding or are impacted by pests for targeted application of pesticides.

The Project uses eleven different herbicides, none of which are included in the IDB Invest's Exclusion List [i.e. categorized as extremely (1a) or highly (1b) hazardous by the World Health Organization (WHO)[\[9\]](#)]. Also, presently, no IFC hazardous materials guidelines are being exceeded. However, future developments surrounding glyphosate should be closely monitored by Klabin and preliminary consideration of potential replacement products should be undertaken[\[10\]](#).

To control leafcutter ants, Klabin uses sulfluramid, whose active ingredient (perfluorooctane sulfonate-PFOS) is a persistent organic pollutant and is included in Annex B of the Stockholm Convention[\[11\]](#). Currently, Brazil has an exemption for the use of PFOS as insect baits for control of leaf-cutting ants (*Atta spp. and Acromyrmex spp.*). Brazil also has a derogation by FSC for the use of sulfluramid up to 2021. The current use of sulfluramid is 2.8 kg/ha and this application rate has remained stable for the last five years[\[12\]](#). Klabin has a partnership with the *Instituto de Pesquisas e Estudos Florestais* (IPEF) to research alternative biological and chemical methods to control leafcutter ants.

The main hazardous materials storage facility in the Lagoa nursery has reached over-capacity and as such it needs to be enlarged or replaced, to also include appropriate containment for spill collection.

- 4.3.b.3. Effluents

The construction of PUMA II will not generate significant quantities of liquid effluents (portable toilets to be used will require no water).

Treated liquid effluents from operations of PUMA I are discharged in the Tibagi river. Ambient water quality of the Tibagi river has been monitored since 2013 (both upstream and downstream of the underwater effluent emissary), twice per year by external consultants (Acquaplan, Teclab, or Bioagri). Liquid effluents from PUMA I are monitored daily by Klabin prior to their discharge (pH, total solids-TSS, chemical oxygen demand-COD, BOD, total Phosphorus, total Nitrogen). Parameters requiring more complex analytical methods are monitored monthly (toxicity) or twice per year (AOX) by external consultants. The Parana Water Institute has granted a permit for the release of effluents from Puma I and II, which is valid until 2022.

In 2012, as part of PUMA I's environmental impact assessment (EIA), Klabin commissioned a wastewater dispersion study that comprised planned effluent releases both for PUMA I and PUMA II combined, for a total production of 7,400 m<sup>3</sup>/h. The study used the CORMIX model and contemplated two scenarios: i) a free-flowing river; and ii) a scenario taking into account the establishment of the Maua hydroelectric plant's reservoir, 20 km downstream from PUMA's effluents release point- hence, thereby altering PUMA's section of the river (i.e. a reduced flow habitat akin to a lake-like environment in 2014).

Mixing zones of color and biological oxygen demand (BOD) were modeled both for mean and low flows. In all scenarios, the distance from the effluent release point to the area where concentrations of BOD and color comply with ambient water quality standards is within the acceptable range (*Resolução* CONAMA N<sup>o</sup> 357/2005 Classe 2). Further, while some water quality parameters (e.g. phosphorus, oil and grease) do not always comply with Brazilian ambient water quality standards, no significant difference in concentrations have been found upstream and downstream of the effluent release point, indicating that concentrations of these pollutants are not due to PUMA I operations.

- 4.3.b.4. Air Quality and Atmospheric Emissions

Air emissions from the recovery boilers, biomass boilers, and lime kilns are monitored continuously and tested twice per year by external consultants (PM<sub>10</sub>, SO<sub>x</sub>, NO<sub>x</sub>, TRS, CO). According to PUMA I's records and the IESC monitoring reports, monthly averages of air emissions have consistently met IFC EHS Guidelines for Pulp and Paper. PUMA II has also been designed to meet IFC EHS Guidelines for Pulp and Paper (2007) and EU BAT Pulp and Paper Industry (2001).

The RAP study (2018) contains an air dispersion model study as a key input to the CIA assessment that factors PUMA I and II emissions as well as those from Monte Alegre (the existing plant in the neighboring city of Telmaco Borba). Results of the air dispersion model project a maximum 1-h NO<sub>2</sub> concentration of 47.3 µg/m<sup>3</sup> at PUMA and 253.6 µg/m<sup>3</sup> at Monte Alegre, with maximum 1-h NO<sub>2</sub> cumulative effect of both projects of 253.6 µg/m<sup>3</sup>. However, no background concentrations were added to the modelled concentrations.

Using the monitoring results of measured 1-h NO<sub>2</sub> concentrations from the 2015 campaign (15 µg/m<sup>3</sup>) as background, the cumulative effect of both projects (PUMA I + II and Monte Alegre) is at 84% of the primary CONAMA criteria and exceeds the secondary CONAMA criteria of 190 µg/m<sup>3</sup>. However, the model used equipment-guarantee emission levels for PUMA II which, according to the

IESC report, would provide an over-estimate of expected emissions when compared to operating data for PUMA I. Also, the meteorological data used did not include wind speed and is generated at a site distant some 35Km from the PUMA plant.

Ambient air quality is monitored twice per year by an independent consulting firm in sites in Ortigueira, Telemaco Borba, Imbau and in the closest rural dwelling to PUMA I (for TSP, PM10, PM2.5, SOx, NOx, TRS, CO). In the latest monitoring campaign (November 2018) concentration of TRS (odorous nuisance to humans) was below detection levels in both sites closest to PUMA I. Other ambient air quality parameters complied with Brazil's recently updated regulation CONAMA 491/2018. Only daily averages of PM10 were slightly above the threshold (about 60 µg/m<sup>3</sup> versus 50 µg/m<sup>3</sup>) in Ortigueira and the local rural dwelling. Both sites are located in an area of agricultural production accessible only through dirt roads, hence the likelihood that these high concentrations are due to road dust.

Klabin will revise the air dispersion model by: i) validating wind data to assure accurate meteorological conditions are used; ii) adjusting expected PUMA II performance levels based on operating experience with PUMA I; and iii) reflecting most recent changes in emission sources as a result of project design changes since the RAP (e.g. no bleaching line, no cardboard paper machine, etc.). The updated air dispersion model will inform the revised cumulative impact assessment (CIA). If needed, the recovery boiler, lime kiln and power boiler firing conditions will be confirmed as consistent with minimization of NOX and SO2 emissions. If analysis still shows non-compliance, then alternate measures (such as flue gas scrubbing or desulphurization technology) should be investigated and incorporated into the design.

- 4.3.b.5. Noise

Results of measured ambient acoustic data contained in the RAP indicate that a couple of sites already exceeded the nighttime limit as per the national legislation. However, the IESC identified methodological issues and, hence, a new acoustic baseline will be established and benchmarked against IFC General EHS Guideline 1.7. Also, the noise model part of the RAP did not include future, projected increase in traffic patterns. These will be taken into account in the revised noise model, along with noise guarantees for all final additional PUMA II equipment to be used as inputs, as a means to update the cumulative impacts assessment.

#### **4.4. Community Health, Safety and Security**

##### *4.4.a. Community Health and Safety*

- 4.4.a.1. Transportation of wood logs

The Project's forestry operations in Parana has 85 trucks. Klabin also has a contracted fleet of additional 430 trucks. The average number of trips by logging trucks to Monte Alegre and PUMA I is 780 per day. With the launch of PUMA II, Klabin's daily wood demand in Parana will increase to approximately 950 truck shifts per day. Furthermore, the average transportation distance is expected to increase from 90 km to 120 km. The current road transportation network goes through 83 communities or dwellings. Before an area is harvested, Klabin identifies the communities and dwellings along the route. Then its social team approaches the communities to inform about the pending transit of trucks, agrees on times when trucks should not circulate (e.g. times when children are going to/coming from school), and provides information on Project's external grievance mechanism (see section 4.1.i above)[\[13\]](#).

Klabin is continuously researching and testing means to reduce road dust; innovations include

sprayers in front of logging trucks and road surface compacting material. In addition to vehicle monitoring systems, Klabin has driver safety and vehicle maintenance requirements as well as driving hours limit. To reduce the risks of vehicular accidents further, it has installed satellite telemetry and on-board video monitoring in its own trucks, which are monitored 24/7 by a specialized team who is in contact with drivers via radio. The system allows to upload maps with specific speed limits and warns drivers when they surpass the limit. However, in contrast, contracted trucks are only equipped with radio transmitters that allows to monitor their location but not the speed on real time. Information on speed is averaged daily by the forestry logistics team.

Notwithstanding significant advances in wood transport safety described above, in 2018 there were 24 logging truck rollovers and 22 high potential incidents. Therefore, for PUMA II all new contracts with logistics companies will require the installation of telemetry and on-board video monitoring (full fleet installation by 2021).

To mitigate risks of conflicts with Brazil's Landless Workers Movement, Klabin has established a policy to limit the area of plantations in any municipality to a maximum of 25%. Also, it does not purchase land from “*assentamentos*” adjudicated to farmers by the National Institute of Colonization and Agrarian Reform (INCRA).

- 4.4.a.2. Hazardous Materials Management and Safety

As per the FSC certification requirements, Klabin has a well-established procedure to transport (through the communities), store and use hazardous materials.

- 4.4.a.3. Ecosystem Services

As part of its plantation planning process, Klabin’s social team identifies any existing indigenous or traditional (e.g. *faxinal*, *quilombola*) communities within a 5-10 km buffer around its prospective land acquisition areas, where further analysis is required to ensure no encroachment on any community-dependent ecosystem service occurs.

- 4.4.a.4. Community Exposure to Disease and Other Risks

Community risk to disease exposure is considered low, given that the vast majority of the workforce will be lodged at fully equipped and furnished worker’s accommodations (buildings), minimizing direct contact with local communities. Experience from PUMA I indicates that the proposed all-inclusive model for workers’ residencials significantly mitigate community interaction risks.

To reduce project-induced in-migration, contractors will be required to recruit workers through public employment agencies located within a 600 km radius from the project site. In addition, employers will provide the necessary resources to allow for the regular re-entry of workers to their place of origin and will be responsible to demobilize workers at the end of their contract.

The Committee for Anthropic Impact Monitoring is considered a best practice from PUMA I. It was set up in 2013 to monitor the socio-economic impacts in the Project’s area of influence in the municipalities of Ortigueira, Telemaco Borba, and Imbau. This multi-stakeholder Committee, which includes Klabin, has been meeting regularly to analyze indicators in education, health, public safety, economic development, social services, and public finances. Safety indicators include the number of cases of sexual violence against women and children, and domestic violence.

At its May, 2019 meeting it was requested that Klabin engage the assistance of non-governmental organization(s), as done for PUMA I, to provide support for the prevention of violence and sexual abuse against children and to strengthen the response services. These services will include gender-

based violence (GBV) prevention programs for target groups (children, adolescent groups, sex workers, etc.) in the project area and in hotspots along transportation corridors. The organization(s) will also assess the quality of psychosocial, medical, police and judicial response services to GBV survivors in the project area and provide recommendations to the Committee for strengthening of these services,

- 4.4.a.5. Emergency Preparedness and Response

Klabin also has a well-structured forestry fire prevention plan that includes watch towers, radio communication, meteorological monitoring, permanent terrestrial monitoring, training, firefighting trucks and a network of water supply points for firefighting. Its fire brigade relies on 36 direct employees and 50 employees from contractor's firefighting teams. The Project has operational procedures applicable to planting and harvesting operations including increased setbacks of plantations from residential buildings to avoid accidental tree falls during harvesting or due to natural storm events. However, there is no emergency plan established for forest operations beyond emergency protocol procedures. Moreover, the induction and refresher training programs related to the protocol need to be strengthened to enhance personnel's clarity about how to proceed in case of accidents with third parties involved (i.e. local communities).

At the PUMA I plant site operations emergency response crew and equipment are available to incorporate PUMA II, and there will be a special arrangement to cover emergencies during the construction period of PUMA II.

#### *4.4.b. Security Personnel*

Klabin's forestry assets in Parana are safeguarded by a team of mobile patrols (23) and observation towers (19). Security officers are unarmed and trained in conflict resolution. The Project's efforts in improving relationships with neighboring communities has allowed the company to reduce the need of security officers in the past decade.

Access to industrial sites is controlled at checkpoints by unarmed security officers who are trained to respond to threats to company's facilities and request the intervention of police forces in case of criminal activities. During the construction of PUMA II, access to the construction site will also be monitored by Klabin. All employees, visitors, and contracted workers entering the site must carry an identification badge.

### **4.5. Land Acquisition and Involuntary Resettlement**

This Performance Standard does not apply to this Project<sup>[14]</sup>.

### **4.6. Biodiversity Conservation and Natural Habitats**

#### *4.6.a. Protection and Conservation of Biodiversity*

Klabin has been implementing an aquatic fauna monitoring program for PUMA I. The program will continue with the expansion of PUMA II. The most recent aquatic fauna monitoring campaign took place in January 2019. No difference in species diversity was identified upstream and downstream the effluent release point and no long-range migratory, endangered, or endemic species were identified as-well. Is important to note that the Tibagi river area where effluent is released has been impacted by the Maua hydroelectric dam since 2014.

The Project has a nature interpretation and wildlife rescue center, and environmental education programs for students in Telemaco Borba and Ortigueira. Klabin engages an environmental

consulting firm to regularly monitor the presence of terrestrial fauna inside its protected areas and plantations, and the health of the forest ecosystem.

#### 4.6.b. Sustainable Management of Living Natural Resources

In 2018, 7.2 million tons of wood were harvested from Klabin's owned and leased plantations, and 3.5 million tons were acquired from 160 third-party suppliers (including "fomentados", see below). All of Klabin's forest management units are third-party certified by the Forest Stewardship Council (FSC[15]).

Klabin also has an outgrower program with small farmers called *Fomento Forestal*, which has more than 3,000 participants, covering 50,000 ha of plantations. In addition to provide seedlings and technical assistance, The Project -through a local environmental NGO- assists farmers in the identification, protection and restoration of Areas of Permanent Preservation (APP) and Legal Reserves inside the farms, and in the registration of the properties in the *Cadastro Ambiental Rural* (CAR[16]). The ultimate objective is to create corridors of native vegetation to benefit wildlife. Currently, about 250 "fomentados" covering 10,000 hectares of plantations, are certified under the FSC small or low-intensity managed forest (SLIMF) program. Klabin covers FSC-auditing expenses and pays a premium price for FSC-certified wood.

Third-party farms not FSC certified are assessed against FSC criteria for controlled wood. In 2018, Klabin conducted 814 audit visits (the Project must maintain the amount of controlled wood below 30% to maintain its FSC certification). As a result of these controls, 12 shipments were put on hold until the supplier corrected the identified non-compliances[17].

#### 4.6.c. Invasive Alien Species

Klabin actively manages its private reserves - mostly constituted of the highly-threatened Brazilian Atlantic Forest ecosystem. The company has a strong program to control invasive species and regularly conducts fauna and flora monitoring through a team of patrimonial lookouts and workers dedicated to the control of invasive species, as well as identification of high value conservation forests (HCV) as part of the FSC certification requirements.

### **4.7. Indigenous People**

The PUMA II Project will not directly affect any indigenous peoples or lands. However, the ESIA for Puma I (2013) identified two indigenous communities of the Kaingang ethnic group in the project's indirect area of influence: Queimadas and Tibagy-Mococa. As part of the permitting process, Klabin engaged an anthropologist to develop an indigenous people plan (*Plano Basico Ambiental Indigena - PBAI*). The PBAI was finally approved by the National Indian Foundation (*Fundação Nacional do Índio -FUNAI*) in April 2019. The plan includes multiple programs - participatory monitoring of Puma's environmental impacts, revitalization of Kaingang culture and handicrafts, biological corridors and agroforestry - and has a duration of five years. The PBAI will be implemented by Klabin.

The Project carries out a continuous mapping of all indigenous or traditional communities around its forestry management units to identify the risks and impacts of its operations to these communities.

### **4.8. Cultural Heritage**

This Performance Standard does not apply to the Project.

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- [1] From June 10 to 14, 2019.
- [2] Forest Stewardship Council.
- [3] More information is available at: <https://www.klabin.com.br/en/sustainability/>. Klabin's 2018 Sustainability report is available at <http://rs.klabin.com.br/en/>
- [4] The workers' lodges have fire extinguishers and fire hoses, but lack smoke detectors (in the case of Bandeirantes and São Francisco), fire alarms, evacuation signs and muster point.
- [5] A requirement of the permitting process for Puma I and only recently approved by FUNAI.
- [6] The regulation cover the following: i) personnel management (worker's grievance channel; labor and trade union relations); ii) administrative structure (contractors and subcontractors); iii) recruitment, selection and hiring of labor (registration and mobilization); iv) sources of recruitment (local and regional); v) employment contract; vi) crisis management and prevention; vii) uniform supply and washing; viii) transportation of personnel; ix) accident insurance; x) return to the place of origin; and xi) labor liabilities.
- [7] According to the 2013 Tibagi River Basin Plan (Plano da Bacia Hidrográfica do Rio Tibagi), the amount of total surface water granted into concession was 868,373 m<sup>3</sup>/day, corresponding to 24% of the water available (3.67 million m<sup>3</sup>/day). The plan identified the area where Puma is located at moderate risk in terms of water demand versus availability.
- [8] The best available techniques (BAT) reference document (BREF) on Production of Pulp, Paper and Board was adopted by the European Commission (2001).
- [9] At least 5 chemicals used by Klabin were found on the FSC list of highly hazardous pesticides: two used by the nursery (Imidacloprid - Case #138261-41-3, and Trifloxystrobina - Case #141517-21-7); and three in the field (Flumioxazina 0- Case # 103361-09-7, Isoxaflutole - Case # 141112-29-0, and Sulfluramid - Case #4151-50-2). A fourth chemical used in the field (Haloxypop - Case #69806-34-4) has a similar case number to Haloxypop-menthyl (69806-40-2) and needs to be confirmed.
- [10] The most commonly used herbicides are those containing glyphosate (the active ingredient in several herbicides including Roundup and Touchdown). According to the latest FSC forest certification audit (2018), in 2017 Klabin applied 128,000 liters of glyphosate to an area of 37.700 ha. Although glyphosate meets the WHO condition in the IFC Forest Harvesting Guidelines (i.e. not acutely toxic), its toxicity is currently under review by the WHO, which has added it to the list of products "probably carcinogenic" to humans (2015). A handful of recent court cases held the U.S. have ruled that it had caused cancer in plaintiffs and awarded large penalties against Bayer (all are now under appeal).
- [11] At its most recent meeting (May 2019) the use of sulfluramid for control of ants was permitted to continue, with no phase-out deadline applied by the Stockholm Convention.
- [12] There has recently been a substantial increase in the area treated for damage by leaf-cutting ants from 16,885 ha (2003) to 69,394 ha (2018), with most of the increase occurring in the last two years. However, this increase indicates an expansion in planting activities given that the area of



herbicide application, subsoil preparation, and fertilization also increased in the same order of magnitude over the same period.

[13] In 2018, Klabin received 873 complaints in Parana, more than half of the complaints were linked to truck traffic: road dust - 29%, road conditions - 12%, speeding - 5%, dangerous overtake - 5%.

[14] Noteworthy, Klabin has a detailed documented land acquisition process (procedure) to ensure willing-buyer-willing-seller transactions.

[15] <http://www.fsc.org>

[16] The CAR is a federal program designed to regularize rural properties in terms of compliance with the Federal Forest Code, which ensures amongst others the protection critical habitats and mandates conservation set-asides in private properties: <http://www.car.gov.br/#/>

[17] Klabin does not purchase non-traceable wood.

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**August 21, 2019 : Environmental and social review summary (esrs) and (esap) FINALS DOCUMENTS POSTED.**

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