PROJECT SUMMARY

Name of Project:	LOGGING OPERATIONS 1.0
Name of Developer:	LEVI ORLANDO DEO
Contact Details:	35 LUSIGNAN, EAST COAST DEMERARA, GUYANA. +592 652 8858 / +592 220 0905 levi@deosimperial.com / levi_deo@yahoo.com
Date Prepared:	21ST. DECEMBER 2023.
Prepared By:	LEVI ORLANDO DEO
Signature:	.....

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Introduction

General Characteristics of Project Site

This project summary outline is for Levi Orlando Deo (the Concessionaire) of 35 Lusignan, East Coast Demerara, Guyana, a private individual who has a wealth of knowledge in the forestry sector, particularly logging and sawmilling.

On the 2nd February, 2022, the Guyana Forestry Commission (GFC) entered into a Forest Concession Agreement with the Concessionaire under *Section 6 of the Forests Act 2009* and State Forest Authorisation (SFA) No. Ess 03/22 was issued. Ess 03/22 constitutes approximately 7,267 hectares (17,957 acres) of forest, situate on the Right Bank of the Arapai River and the Right Bank of the Kabasaina River.

Between the 18th – 21st October, 2022, the GFC conducted a reconnaissance exercise to identify the location and boundaries of the concession. Between the 23rd January – 1st February, 2023, the GFC conducted a Boundary Demarcation exercise, where it was discovered that the starting and ending of the cut line which are sources of an unnamed tributary shifted northernly for approximately 150 metres. On 7th August, 2023, the GFC authorised the concessionaire to operate a Sawpit Licence within SFA Ess 03/22 until the 31st December, 2023.

The project is based on the sustainable harvesting of timber from the concession area, then conveying these *via* river or possible road networks to the coast for the domestic market.

General Predominant Land Use

Logging is the primary economic activity and land use in the surrounding areas of the concession. No other economic activity, including eco-tourism and agriculture cultivations, has been detected within the concession area.

Main Communities and Settlements

The main communities in the district are Kwabanna, Akawini and Waikrebi. These Amerindian villages lie outside of the concession area and none of them share a common boundary with the concession area.

Relative Abundance of Resources

The project area comprises pristine forests. The concession area has never been logged.

Non-Disputed Nature of the Land

As far as can be determined, the entire concession area comprise State lands; so that there are no private lands within the concession area. The logging community is committed to using the resources in the area in line with their respective concession agreements.

Description of Feasible and Reasonable Alternatives

The orderly removal of timber via a forest concession, will create employment and contribute to the development of the forestry sector and support national development through taxes and royalties. Other economic options such as eco-tourism and agricultural activity do not appear feasible at this time.

Reduced impact logging systems, which emphasis the planning all interventions into the forest resources, when combined forest management practices such as the use of minimum diameter limits for felling trees and yield control parameters, all represent efficient and feasible way for conducting sustainable timber harvesting activities in Guyana. Preharvest inventories and tree marking respectively that take account of the spatial distribution of merchantable species, terrain and stream patterns will be the basis for selecting the merchantable, harvesting stock.

While processing logs at stump and employing the use of a portable mill within a concession area create impacts such as noise and dust pollution and also create waste which is expensive to dispose of, the Concessionaire will endeavour to minimise these methods of logging and sawmilling. Milling timber on the forest floor also requires more employees and equipment traversing the forest floor. Other timber harvesting options such as Cable Yarding Systems or Aerial Logging are not feasible for Guyana, given the spatial distribution of merchantable species and the prevalence of fog and mist.

Description of Available Baseline Information – The Physical Environment

Parameters for temperature regimes within the concession area may be extrapolated from data sourced from the concession area. During field work spread over 11 sample points between 18th – 21st October, 2022, between the hours of 8:40 and 14:45hrs, a temperature range between 23.5° C and 30.7° C, with a mean temperature of 28.2° C were recorded. Mean Relative Humidity recorded during the period 18th – 21st October, 2022 for 11 sample points was 76.4%.

The concession area is nestled between the Right Bank of the Arapai River and the Right Bank of the Kabasaina River. During the rainy season, it is easy to traverse the rivers, but their use for hauling logs by pontoon or barge seems not to be feasible due to rock bars and waterfalls. The primary soil type in the concession area is Kanhapludults, which constitute very deep, well-drained soils, with a slight to high erosion hazard.

Existing Roads and Trails

There is no network of roads within the concession area; however, there are trails which can be traversed using ATVs.

Vegetation

The concession area is covered with pristine forests. The forest type is dominated by purpleheart (peltogynevenosa), locust (hymenaeacourbaril) and clumps of wallaba (dicymbe atlsonii). The forest resources are quite diverse with at least fifteen (15) forest species. The reconnaissance inventory also revealed Washiba and Bulletwood. Many of the forest types occur on steep terrain, which will not be harvested. The net productive area for the concession area is about 75% of the concession area.

Fauna

In respect of fauna, initial assessments point to significant levels of diverse fauna. Although there is fishing along the rivers in close proximity to the Amerindian villages, there was no fishing or hunting observed in the concession area. The closest shop to the concession sold meat and chicken which were sourced from the Essequibo Coast. Diverse mammalian fauna, arborial fauna (particularly monkeys), avian fauna (including powis and warakabra) and a wide variety of reptiles were frequently observed during field work.

Socio-Economic Environment

The driver of the socio-economic environment in and around the concession area is logging. Apart from the residents of the Amerindian villages which are not particularly close in proximity, about 150 people occupy the area around the concession. About 15% of these are female, engaged as cooks or running small businesses. Most of the loggers do not live there and treat the area as a work zone. Loggers traverse the concession area *via* boat and an occasional ATV. Goods (including groceries, machine spares and fuel) are transported via boat. Kwebanna River Front is an ad-hoc community: there are only business enterprises there. While there is no evidence of any formal local authority, such as a Neighbourhood Democratic Council (NDC) there, the GFC has an office closeby.

Loggers within concessions have been routinely removing small volumes of timber from the concession area for their personal use.

Layout of the Project

The logging project will encompass the entire concession area, although only the areas that form the net part of the concession will be logged. The area of the concession which will be harvested

per annum will be in accordance with the Second Schedule of the Forest Concession Agreement No. Ess 03/22.

Project Description

The Concessionaire proposes to harvest logs from the concession area, subject to sustainable practices agreed with the GFC, and to convey the logs and lumber to the coast for the domestic market.

As is, access to the concession area is only *via* boat. An access road is currently being cut by the Government of Guyana, through the concession immediately South of Ess 03/22. Transporting personnel, equipment, logs, lumber and other goods is therefore difficult at the moment. However, once the road is complete, production and profits are projected to increase.

The Concessionaire intends to construct a base camp at an advantageous and strategic location in the concession area, which will cater for a maximum of twenty (20) persons initially and will install facilities for generating electricity and potable water, and for preventive maintenance of machines and vehicles.

Investments

The Concessionaire proposes to invest $100,000,000 (Guyana Currency) in the development of the concession area over the period 2024-2026, with 50% of the budget being allocated for new heavy-duty equipment and vehicles.

Staffing

The Concessionaire projects that 35 field operatives will be required at full operations. The concessionaire is prepared to recruit males and females from the Amerindian villages closest in proximity to the concession, once they subscribe to the training that will be provided and the disciplinary framework of the concessionaire. All staff will be paid regularly on a fortnightly and monthly basis. (Only tree fellers will be paid fortnightly). All employees would be required to use personal safety gear (inclusive of snake gaitors, gloves, helmets, visibility vests, ear muffs, based on job specification), which the concessionaire will provide. Employees will be required to subscribe to standardized environmental policies.

Annual Production Output

The Concessionaire projects a sustainable annual output of 2,000 m^3 of timber, covering over 15 species of timber. This implies a mean monthly production of 166 m^3.

Waste

The Concessionaire expects to generate tree crown debris, which will remain on the forest floor, decompose and contribute to soil fertility. Other timber waste of wood debris derived from grading logs prior to their transport to the Concessionaire's wood processing facility will also be left on the forest floor.

Waste Generation

During the daily operation of the sawmill, several types of waste products will be generated from a number of sources. Each waste stream may or may not require different disposal methods. The main categories of waste generated are as follows:

(a) Solid Waste
(b) Liquid Waste
(c) Hazardous Waste

Solid waste generated from the operation of the sawmill are discussed below: General Waste (inclusive of domestic waste and kitchen waste): Two collection bins will be placed at strategic locations throughout the sawmill worksite, to be used by workers. When filled, domestic waste will be burnt weekly. Wood Waste (inclusive of sawdust, shavings, wood ends, wood chips and wood skins) Waste generated by the sawmill will be used as land filling material.

Liquid Waste: Sewerage will be disposed of in pit latrines constructed in accordance with GNBS Code of Practice for the Design and Construction of pit latrines and associated secondary treatment and disposal system.

Hazardous Waste (inclusive of waste oil, used filters, old batteries, oily rags): Waste oil generated from the servicing of the generator once per month will be approximately ten (10) gallons and will be collected and stored in five-gallon plastic pales. It will be re-used on the chainsaw and also used as lubricant on equipment and machinery at the sawmill. Used filters, old batteries and oily rags will be stored and disposed of in a manner approved by the EPA.

Risks and Challenges

The absence of an existing road network significantly impinges on the productivity and profitability of logging operations. The Concessionaire, with no alternative, is forced to transport personnel, logs, lumber, machinery, fuel and other goods *via* the intricate river network. Additionally, during the rainy season, trails can be reduced to inoperable conditions. Should an emergency arise, commuting to the closest health centre will be delayed because of the distance involved.

Potential Impacts and their Significance

The interventions necessary to extract timber from the concession area will generate environmental impacts. These interventions include road construction, the establishment of skid trail and log markets, the clearing of land for campsites, impacts generated from the long-term human occupation of camp sites, the felling of trees and the use of myriad machinery. Fortunately, most these impacts will be confined to the concession area and village councils will be duly informed of operations which they come to about 500m from common boundaries.

Summary of Environmental Impacts and their Significance

Environment Type	Project Activities	Project Phase(s)	Potential Environmental Impact	Impact Significance
Physical Environment (Land/Soil)	Land clearing operations (for the construction of base camps, roads, log markets and mechanical workshops)	Preparatory Phase/Operations	Removal of specific site vegetation to facilitate the construction of project facilities exposes the soil surface, facilitating soil erosion. Scarification of soil surface and sub-soil, soil compaction.	Ex: Ir: Lt: Un: M: Sig: Hp
	Operation of Machineries	Operations	Soil compaction from multiple passes of heavy vehicles over soil surface.	Ex: Ir: Lt: Un: M: Sig: Hp
	Waste Disposal (solid and liquid waste)	Operations	May result in soil contamination from indiscriminate disposal of liquid, solid and hazardous waste	Lo: Rv: St: Av: M: In: Lp
	Fuel and Oil transportation, handling, and storage	Operations	Pollution from fuel and oil as a result of a spill during transportation, handling, or storage.	Lo: Ir: Lt: Av: M: Sig: Lp.
Physical Environment (Water Resources)	Clearing of lands for the construction of base camps, roads, log markets and mechanical workshops	Construction/ Operations	Potential increase in sediment loads and turbid streams due to surface run off and erosion. Removal of vegetation	Ex: Rev: Lt: Av: M: Sig: Hp
	Construction of bridges and the installation of culverts	Construction/ Operations	Potential reduction/obstruction of stream flow from the installation of bridges and culverts	Lo: Rev: Lt: Av: M: Sig: Lp:
	Waste Disposal (solid and liquid waste)	Construction/Operation	Contamination of water in proximity to disposal sites, modifications in water temperature, turbidity, ph. Pollution with oil	Ex: Ir: Lt: Av: M: In: Lp
	Fuel and Oil transportation, handling, and storage	Construction/Operation	Contamination of water in proximity to storage sites, modifications in water temperature, turbidity, pH. Pollution with oil	Lo: Ir: Lt: Un: M: Sig: Lp
Physical Environment (Air)	Operation of chainsaws, and heavy-duty equipment.	Construction/Operation	Noise, dust, and smoke generated from the operation of the various equipment. Changes in microclimate.	Ex: Ir: Lt: Un: M: Sig: Hp

Environment Type	Project Activities	Project Phase(s)	Potential Environmental Impact	Impact Significance
	Clearing of lands	Construction/Operation	Excessive exposure of soil to constant traversing of heavy-duty vehicles over exposed soil	Ex: Ir: St: Av: M: In: Lp
	Operation of heavy-duty vehicles and equipment.	Operation	Dust and particulate matter resulting from the operations of chainsaws and movement of vehicles.	Lo: Ir: Lt: Un: M: Sig: Hp
Ecological Environment (Flora)	Clearing of lands for the construction of base camps, roads, log markets and mechanical workshops	Construction	Destruction of vegetation from the clearing of lands for construction purposes.	Ex: Ir: St: Un: Im: Sig: Hp:
	Harvesting of Logs (Logging and extraction)	Operation	Reduction in tree species specific to the areas of logging/Genetic erosion of plant species/decline in soil fertility due to removal of biomass from poor soils/Increased potential for blow downs of residual trees due to freer flow of air though the canopy/under-storey.	Ex: Ir: Lt: Un: M: Sig: Hp:
Biological & Ecological Environment (Fauna)	Clearing of lands for the construction of base camps, roads, log markets and mechanical workshops	Construction	Modification, fragmentation, and destruction of habitats (especially in terms of cover and food sources); depletion in number,/variety of some species	Ex: Rev: St: Un: M: Sig: Hp:
	Presence of humans	Construction and Operation	Increase in the level of predation, modifications of prevailing ecological relationships: plant-plant, plant-animal, animal-animal	Lo: Rev: St: Av: M: In: Lp
Socio-economic Environment (Occupational Health & Safety)	All construction and Operation activities	Construction/Operation	Risk of accidents from the use of the various pieces of equipment onsite	Lo: R: St: Av: M: In: Lp
	Operation of machineries and equipment	Construction /Operation	Continuous exposure to excessive noise and vibration from the operation of equipment.	Lo: Rev: St: Av: M: Sig: Lp
	Conflict resulting from the Change in Land Use activities	Construction /Operation	Restriction of access, perceived alienation of rights, unplanned changes in lifestyle, restrictions on hunting.	Lo: Rev: St: Av: M: In: Lp

Environment Type	Project Activities	Project Phase(s)	Potential Environmental Impact	Impact Significance
Socio-economic Environment (Employment)	Increase in workforce	Construction /Operation	Increase in the incidences of crime, increase in the use of illicit drugs and alcohol, socially unacceptable behaviour and inappropriate with members of close-by communities.	Lo: Rev: St: Av: M: Sig: Hp
	Hiring of Workforce	Construction /Operation	Skills transfer , Training opportunities job creation, increase in incomes and cash flows	Ex: Ir: Lt: Un: M: Sig: Hp
	Regional Development	Construction /Operation	Improvement of infrastructure. Crime; use of alcohol; health risks, disagreeable behaviour	Ex: Ir: Lt: Un: M: Sig: Hp
Socio-economic Environment (Archaeological Resources)	Construction and operational activities	Construction /Operation	Loss, destruction, or modification of assets of archaeological significance	Lo: Rev: Lt: Av: M: In: Lp

Impact Significance (parameters): Lo-**localised,** Ex-**Extensive/** Rev-**Reversible,** Ir-**reversible;/** St-**short term,** Lt-**long term/** Av-**Avoidable,** Un-**Unavoidable.**

M-**Mitigable,** Im-**Immitigable/** Sig-**Significant,** In- **Insignificant/**Hp-**High probability,** Lp-**Low probability**

Overview of Environmental and Mitigation Measures

The primary mitigation measures that the Concessionaire will employ are as follows:

(A) Employee Education: All employees will be informed of the negative impacts that logging creates, as well as arising from improper disposal of waste. Regular briefing sessions (in accordance with GFC and EPA guidelines, will be utilized and pamphlets and brochures will be circulated.

(B) Appropriate Waste Management Practices: Waste will be disposed of in an acceptable manner so that potential pollutants do not enter the environment, and water bodies in particular.

(C) Collaboration with Stakeholders: The Concessionaire will collaborate and engage with other legitimate resource users as far as possible to reduce conflict.

(D) Use of RIL practices: The Concessaire will use Reduced Impact Logging Practices which emphasizes planning of all interventions in the forest resources, the proper use of machines, due attention to occupational health and safety practices, and general forest conservation practices.

(E) Heavy-Duty Machine Diversity: The Concessionaire will maintain the appropriate diversity of machines to ensure the most efficient field practices. Care will be taken to maintain machines.

(F) Environmental Data: The Concessionaire will set up a network of permanent sampling points that collect air and water quality data. A mini-Hydrometeorological Station will be established in this regard.

(G) Robust System of Collecting, Analysing and Reporting on Environmental Data: The Concessionaire will maintain a robust system of records to facilitate environmental management and the preparation of environmental reports.

Summary of Mitigation Measures

Predicted impact.	Proposed mitigation measures
Physical Environment	
Earthworks Grubbing, cut and fills, scarification of soil surface, sub-soil exposure , erosion, compaction, water logging	• Plan roads, bridges and culverts paying attention to topography and the use of stock maps. • Use appropriate machines for all earth works to reduce the time taken to complete each activity. • Consider the weather pattern before initiating major earthworks. • Follow the recommendations of the CoP (Sections 4.5-4.7, Section 5)
Air quality: Dust and smoke (especially along roads) minor changes in micro-climate	• None. In any event, dust and smoke do not represent a major impact. However, Occupational Health and safety must be an integral part of planning and conducting all operations; for example, GMSI's staff would use dust masks (as well as safety helmets, goggles, and earmuffs during normal work. • Vehicles will travel slowly <25 km/hr whenever they pass homesteads or communities.
Water resources: negligible increases in turbidity, temperature, ph.; oil spills	• Strict adherence to RIL principles and prescriptions of the CoP, especially regarding buffer zones along waterways. • Maximum care to be taken to ensure all vehicles and machinery are in a proper state. Dispense or change lube oil only in designated areas. • EPA's Brochure on Water conservation to be placed at all public points around the concession. • Regular briefing sessions for field staff would be formalised. • Care taken to avoid excessive spillage of borax solutions whenever used to treat (some species of) timber.
Biological/ecological environment	
Timber harvesting: destruction of juvenile trees, genetic erosion of species, decline in soil fertility, spillage of oil, increased potential for blow downs	• Implement a system for conducting pre-harvest inventories and preparing stock maps. • Use directional felling techniques for felling trees. • Plan skid trails on the basis of stock maps. • Use winching techniques. • Use heavy duty machines that are fully functional. • Train all field operatives in RIL practices
Wildlife: modification, destruction of habitats, population changes	• Ensure a systematic manner of timber harvesting so that once a block is harvested, the operation moves on (and animals can return). • Restrict hunting activities by placing advisory notices at strategic points in and around the concession area.

Table 3: Summary of GMSI's mitigation measures	
Predicted impact.	**Proposed mitigation measures**
	• Unique ecosystems, habitats and species will be conserved, by restricting logging in areas where they occur.
Ecological relationships: Modifications of ecological relationships. Increased potential for pests.	• Implement proper RIL practices and prescriptions of the CoP (Sections 8, 9 & 10).
Socio-economic environment	
Conflicts: restrictions of access, alienation of rights	• Engage residents in discussion and consultations to address mutual concerns.
Social problems: crime, use of alcohol, other disagreeable behaviour; increase in life threatening behaviour through exposure to various illnesses.	• Work with public agencies (Police, staff of the Ministry of Health, and staff of the Ministry of Regional Development) in Region 7 to address emerging issues. • Keep proper records of emerging problems and pass these on to the appropriate agencies.
Road safety: high probability of road accidents.	• Work with the police and the Kartabu-Puruni Road community and other stakeholders to ensure adherence to proper road use practices and to identify road locations requiring special attention. • Make sure that each vehicle is in a full functional state prior to its use on the roadways, within and outside of the concession area. • Place appropriate cautionary signs at sharp turns, steep grades, and bridges and near populated areas. • Promote proper skills set among drivers through training.
Waste management: illnesses resulting from a polluted environment	• **Observe prescriptions of the Code of Practice For Forest Operator's 3rd Ed. Sections 8.0, 9.1, 9.2** • **Hold frequent briefing sessions with staff to ensure a shared understanding of the consequences of poor control over waste management.** • **Distribute and put-up EPA's brochure on waste management at all camps.**
Indigenous archaeological assets: loss , destruction modification of habitats, landscapes	• Identify and isolate any assets encountered and post appropriate advisory signs and notices. • Ensure such sites are placed on all stock maps. • Build fences around assets and place appropriate signs after consultation with MOA. • Consult with the Amerindian Affairs Ministry and the Walter Roth Museum on collaborative efforts to protect any assets discovered.

Predicted impact.	**Proposed mitigation measures**
	• Collaborate with communities to address the conservation of existing and emerging assets. • Offer training & incentives where appropriate

Non-Technical Summary of Project

The Concessionaire's primary commercial objective is to harvest merchantable timber from the concession area and then to transport logs and lumber via river/road to a wood processing facility on the coast for the manufacture of value-added products.

The EPA's Environmental Authorisation is a prerequisite for the GFC to issue a State Forest Authorisation to a Concessionaire, who will then formally commence timber harvesting and ancillary operations. In granting the SFA, the GFC applies criteria that determine where and in which areas logging will occur, the total area that may be harvested per year, and the maximum volume that will be harvested per year.

First Operational Steps

In the pursuit of its forest concession development, the Concessionaire's first steps are to:

(i) Verify the boundaries of the forest concession, resolve any conflicts with any other party and post signboards for the benefit of stakeholders.

(ii) Conduct forest reconnaissance activity aimed at identifying other land use events within the concession area, identify existing roads and paths within the concession area, and start the process of developing partnerships (with loggers and communities), wherever necessary.

(iii) Set up buffer zones, whenever appropriate. (Typically, loggers maintain a distance of at least 500 m from the edges of mining communities, farmsteads and mining operations; also, loggers maintain a buffer zone of at least 500 m from the boundaries of adjacent Amerindian communities.)

(iv) Identify the area for the biodiversity reserve, and then organize the concession area into compartments, which are duly given a designation for easy reference.

Timber Harvesting Operations

An Annual Operational Plan must be prepared which sets out, inter alia, the following:

(i) The personnel and machinery assets available to harvest the stock contained in the stock maps.

(ii) The primary and secondary road works planned for the current year for the extraction of logs.

(iii) Any developmental works planned for the base camp or forward camps.

(iv) Blocks to be inventorised in the next calendar year.

Log Market Operations

Logs extracted from stump by skidders are normally taken to log markets for grading and sorting as well as for GFC documentation requirements.

Forest Monitoring

A major field operation is forest monitoring. The Concessionaire maintains a constant check as to whether filed operations are proceeding according to plan. A robust forest monitoring system is particularly important to ensuring due compliance with all applicable guidelines generally and environmental management in particular. Forest monitoring is also important for informing positive change for the years ahead. Therefore, feedback from forest monitoring is essential for altering content in the existing forest management plan, as well as strategic planning.

Project Duration

This project is estimated to last for approximately two (2) years, with the option for renewal for a duration deemed appropriate by the GFC.