

## **Appendix F.1**

---

**Amaila Access Road Project,  
Guyana**

**Contractor Environmental,  
Social and Health and Safety  
Management Plan**

**Amaila Access Road Project  
Guyana**

**Contractor Environmental, Social and Health and Safety  
Management Plan**

**(Contractor ESHSMP)**

**Synergy Holdings Inc.  
August 20, 2010  
Version 1.1**

# Contents

---

	<u>Page</u>
<b>Appendices</b>	<b>2</b>
<b>1 Introduction</b>	<b>3</b>
<b>2 Project Works</b>	<b>5</b>
2.1 Project Location	5
2.2 Project Design	5
2.3 Project Construction	6
2.4 Operation and Maintenance	9
2.5 Construction Workforce and Equipment	10
2.6 Construction Schedule	10
<b>3 Requirements</b>	<b>11</b>
<b>4 Prevention, Control and Mitigation Measures</b>	<b>12</b>
<b>5 Monitoring and Supervision Measures</b>	<b>15</b>
5.1.1 Monitoring	15
5.1.2 Supervision and Reporting	15
<b>6 Responsibilities</b>	<b>25</b>
<b>7 Training</b>	<b>27</b>

## Appendices

---

*Annexes are presented at the end of the main text*

Appendix A Environmental, Social, and Health and Safety Mitigation Measures for Construction

# 1 Introduction

---

The Amaila Access Road Project (“Project”) involves the improvement and construction of new roads to provide access to the Amaila Hydropower Project site, as well as clearing of a portion of the hydropower transmission line corridor. The hydropower site is located in the area where the Amaila River and Kuribrong River join together, in west-central Guyana.

The road Project is being implemented by the Government of Guyana’s Ministry of Public Works and Communication (“MOPWC”) through a construction contract with Synergy Holdings Inc. (of the United States). The road Project is separate from the Amaila Hydropower Project which is being implemented by Amaila Falls Hydro Inc., a subsidiary of Sithe Global (of the United States). However, the road Project is included in the update to the environmental, social impact assessment and planning of the overall Hydropower Project, and therefore is following similar standards for environment, social, health, and safety.

The Amaila Hydropower Project encompasses the construction of a dam, reservoir, hydroelectric generation facility, and associated infrastructure such as the access road, and a new high voltage transmission line to Linden and Georgetown. The Government of Guyana has committed to the Amaila Hydropower Project, which is part of the country’s Low Carbon Development Strategy, so as to secure its electricity supply from Guyana’s own natural sources.

This Environmental, Social, and Health and Safety Management Plan (ESHSMP) for the access road (“the Project”) is being implemented by successful bidder for the road contract, Synergy Holdings Inc. The ESHSMP describes the mitigation, monitoring and institutional measures to be taken to eliminate adverse Project related impacts, offset them, or reduce them to acceptable levels. The focus is to assist in prioritizing risk management strategies, with the objective of achieving an overall reduction of risk to human health and the environment, focusing on the prevention of irreversible and/or significant impacts, such as:

- Favoring strategies that eliminate the cause of the hazard at its source; for example, by selecting less hazardous materials or processes that avoid the need for ESHS controls.
- When impact avoidance is not feasible, incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences; for example, with the application of pollution controls to reduce the levels of emitted contaminants to workers or the environment.
- Preparing workers and nearby communities to respond to accidents, including providing technical resources to effectively and safely control such events, and restoring workplace and community environments to a safe and healthy condition. The Project ESHSMP includes the following:
- Mitigation measures to reduce potentially significant adverse environmental and social impacts to acceptable levels.

- Monitoring program to provide information about the effectiveness of the mitigation measures in place by the contractor and to ensure that discharges into the water bodies and streams are not above acceptable limits.
- Responsibility and organization description that identifies the entity responsible for implementing the ESHSMP, including carrying out the Project mitigation measures and monitoring programs.
- Training that identifies the actions to strengthen environmental and social management capability and reinforce employee awareness and responsibilities.

The Project ESHSMP consists of the following sections:

- Project Works (Section 2)
- Requirements (Section 3)
- Prevention, Control and Mitigation Measures (Section 4)
- Monitoring and Supervision Measures (Section 5)
- Responsibilities (Section 6)
- Training (Section 7)
- Appendices

## 2 Project Works

---

The Project works includes the following main components:

- Construction of new roads: one approximately 67 km road from the Bartica-Potaro Road (to the hydropower site, and approximately 5.5 km of new road at the end of the existing logging road from Mabura Hills Road (MHR) to east bank of Essequibo River.
- Improvement of existing roads: Approximately 133.2 km including the initial 49.3 km of the Mabura Hills Road south of Linden, 13.1 km logging road mentioned above (MHR to Essequibo river) and the road from the west bank of Essequibo River(at Butakari) to approximately 15.2 km south of Kaburi on Bartica-Potaro Road (Toolsie road and BPR)
- Bridge over the Kuribrong River at (or near) Portage Falls.
- Bridges, culverts, and other crossings over small streams or watercourses.
- Pontoon (ferry) landings on both banks of the Essequibo River at Butakari, including associated infrastructure and buildings.
- Clearing of trees and vegetation along the access road and within a specified portion of the transmission line corridor from Portage Falls to the hydropower site (approximately 48 km)

The Project design presented herein is based upon the Project contract specifications and the results of the access road survey work.

### 2.1 Project Location

The proposed alignment of the access road Project is shown in the attached set of maps. A summary map showing the alignment and distances of seven (7) sections is attached in Appendix B (figure 1) Each section is discussed below separately and additional maps are provided.

### 2.2 Project Design

The Project may be described as a continuous, all-weather road to be built incorporating existing roads where possible and building new ones as needed to create access from Georgetown to Amaila Falls. The Contractor will be responsible for the upgrading of existing roads and the construction of a new, virgin road including a pontoon crossing on the Essequibo River at or in the vicinity of Butakari and a bridge across the Kuribrong River at or in the vicinity of Portage Falls. Such a bridge or pontoon must be capable of carrying 100 tons minimum and built with appropriate safety factors. This road will allow all weather access to the right bank (when looking downstream) of the Kuribrong River across from the proposed Amaila Falls Power Facility.

## **2.3 Project Construction**

The following presents a summary of key activities and elements associated Project construction.

### **2.3.1.1 Clearing**

This task will consist of removing the vegetation and surface layer of soils along the road corridor using chain saws and heavy equipment (bulldozers, excavators, etc). These soils will be used later to restore the affected areas. Clearing will be conducted according to the forest clearing plan in Appendix A, within the transmission line corridor and where the road alignment is outside the T-line corridor, the road corridor will be separately cleared. The width of the T-line and road corridors will be as per the Road Contract specifications or as revised by MOPWC instructions. The estimated area to be cleared and vegetation removed from the T-line corridor is approximately 4.8 km<sup>2</sup> (48 km long and 100 m wide). The area of the virgin road corridor outside the T-line corridor is approximately 0.6 km<sup>2</sup> (30 km long and 20 m wide). In addition, an estimated 0.7 km<sup>2</sup> will need to be cleared along the BPR in areas where there is an existing road is too narrow to allow for the road widening and for the construction of drainage swales. Total clearing due to the road is estimated at 5.5 km<sup>2</sup>.

### **2.3.1.2 Soil Movement, Quarries, Disposal**

This task includes land leveling and the cuts and fills to be conducted along the road. See typical road section (Figure 2 Appendix B)

The Project will make the reasonable use of the materials excavated in the road area, minimizing the need for additional material extraction. In those sections where the cut material is not sufficient for fill requirements, the required volumes will be filled with material excavated from borrow pits authorized by the Owner and Guyana Environmental Protection Agency .

All of the cut material that is unusable in the road will be suitably spread in the shoulder areas to match the surrounding natural grade. Project plans call for fill and other materials to be obtained from quarry/borrow-pit sites located along the way and shown in the attached Figure 3 Appendix B. These fill and related materials will be transported by truck (typically 15 -20 m<sup>3</sup> volume). The fill activity will use dozer tractors for spreading, shaping, and homogenizing the fill material and stabilizing the slopes. If required, the excavation of areas of solid rock will be performed after an evaluation of the geological sensitivity of the areas to be affected. Excavation will be accomplished by the use of excavators and trucks and self-loading scrapers controlled blasting methods (presently not envisaged but may be required based upon actual field conditions), or hydraulic or pneumatic drills. Most of the needed laterite will be extracted and handled using excavators, trucks, dozers, and front-end loaders. The excavated material will be transported from borrow pits to the work sites, or from excavations in the construction zones to the disposal areas, using 15 m<sup>3</sup> (or similar) capacity dump trucks.

If explosives are required during excavations of loose or solid rock, and also at pits for the extraction of construction granular material, an authorization will be required from Owner and

applicable Guyana authorities. All borrow areas either along side the road or off site will be graded with 1:4 or better slopes to avoid further erosion and wash-outs and to provide acceptable stormwater drainage and to avoid erosion, including suitable stabilization measures as needed.

### **2.3.1.3 River and Stream Crossings**

The Project will require the construction of a number of small bridges over streams, one large bridge over the Kuribrong River, and one barge crossing over the Essequibo River.

- Section #2 – Two new wooden bridges
- Section #3 – Replace two existing wooden bridges
- Section #4 – Replace 3 existing bridges
- Section #5 – Replace an existing bridge
- Section #6 – New steel bridge over the Kuribrong and a new wooden bridge
- Section #7 – Four new wooden bridges

Timber bridges are based on the standard design that CSX Railroad has used. The steel bridge has been designed for a HL-93 vehicle and we specified a U102 vehicle with L/500 vehicle deflection. All bridge designs are in accordance with AASHTO LRFD. All culverts are being sized for a flood event as per the specification and based on rainfall data that has been reviewed by GOG/MOPW. Some smaller streams will be crossed by fill sections over culverts to be designed for a 20-year flood.

### **2.3.1.4 Drainage Works**

The process started with Lands & Surveys maps (1:50000), elevations were cross-checked using the survey and ground truthing field data. These maps were used to model the drainage basins to derive a design output based on a 50-year storm event. In addition, our field crew measured the depth and width of creek crossings at time of survey. These measurements confirm what the maximum height of these waterways will be as all local and hydromet data indicate that the current wet season in 2010 is the wettest ever.

All roads will have drainage ditches and collection points for discharge to suitable watercourses, all according to the construction specifications. Roads will be crowned to provide drainage to outside ditches. Ditches will be appropriately sloped to avoid erosion.. Existing soak-aways or new ones will be appropriately placed to allow for natural run-off to be absorbed and minimize outflows.

#### **2.3.1.5 Road Surface**

When the soil's load-bearing capacity is not suitable, it will be reinforced with sub-material. The layers for sub-grade and sub-base improvement will be constructed with conventional equipment, such as motor graders, tankers, and roller compactors. Material to be disposed of during these activities will be excavated with hydraulic excavators, dozer tractors, and rubber-tire loaders.

#### **2.3.1.6 Traffic Control**

To facilitate traffic movement and safety within and near work sites, the Contractor shall supply, erect and maintain traffic signs, lights, barricades, cones and other material as necessary. The Contractor will station flag persons or road closed signs and barricades to direct the movement of traffic through or around the construction works.

In addition to the installation of the appropriate signs, guard rails at the bridges will be installed. These structures will improve the safety of motorists and pedestrians in the vicinity of the corridor. Other safety features are described in the construction specification.

#### **2.3.1.7 Work Camps**

As work will be proceeding at multiple locations, simultaneously, the contractor shall establish several working camps to support and act as base for each piece of construction (as shown in attached Fig 3 Appendix B). These were identified during the ground-truthing operation. These camps will be kept as small as possible to minimize the environmental impacts. The contractor will reuse the temporary camps that were used during the ground truthing and survey phase. A typical layout of the construction camps is attached as Fig 4, Appendix B.

All camps shall be equipped with adequate numbers of toilet and shower facilities, commensurate with the number of employees at the site. Routine maintenance will be done in the field but if major overhauls are required, and the equipment can be moved, the equipment will be transported to camp where appropriate spill prevention and containments facilities will be in place.

#### **2.3.1.8 Decommissioning and Revegetation**

When construction is complete, all work sites, areas, and camps will be cleaned of trash, all latrines filled in and solid waste pits covered and returned to natural grade, tent posts and tarps removed and retention ponds drained and refilled. The lining under the fue storage area will be removed and the area graded to natural grade and left to see natural regrowth after demobilization. . The contractor will make recommendations on maintaining 1-2 of these as rest areas for the hydro construction workers and supply vehicles as they traverse this area.

#### **2.3.1.9 Power**

During construction, the electricity needed for the personnel camps, and administrative facilities will be provided by portable electric generators fueled by either diesel or gasoline. Solar panels

will also be employed to provide some power at more remote locations and to charge batteries, etc.

#### **2.3.1.10 Water Consumption**

Water for construction (road watering) and for worker camps will be obtained from local sources such as the rivers. River water for cooking will be filtered and boiled first. Drinking water will be a combination of bottled water and treated river water (or ground water); filtered, chlorinated, and/or boiled.

#### **2.3.1.11 Environmental Emissions, Discharges, and Wastes**

The principal emissions, discharges, and wastes generated during Project construction will consist of:

- Air emissions due to an increase in the levels of suspended particles from soil movement and material extraction from quarries, machinery and heavy equipment emissions, equipment and vehicles in operation, as well as dust generation during loading and unloading of soils in the RoW.
- Noise and vibrations generated primarily by the movement of machinery, equipment, and vehicles from the quarries.
- Sanitary wastewater from work camps will be treated and disposed on site or collected and disposed by offsite contractors.
- Solid wastes will be recycled to extent feasible or disposed by hauling to approved landfills in Georgetown..
- Domestic-type solid waste will be produced. All waste, except re-useable and hazardous waste, will eventually be disposed in landfilling facilities within close proximity of construction areas. Waste pits will be located during the actual construction phase of the project and will be designed by the contractor to ensure minimal impacts on the environment. .
- Waste oil and other hazardous wastes (e.g., oily rags, etc.) will be generated and disposed by hauling to the approved landfill facility in Georgetown.

## **2.4 Operation and Maintenance**

The key operation and maintenance Project activities will include:

- Road inspection and maintenance
- Inspection and maintenance of drainage works
- Maintenance of complementary infrastructure (bridges, culverts, pontoon landings, and associated buildings)
- Evaluation, monitoring, and maintenance of road safety.

- Operation of the pontoon crossing
- Staffing of security checkpoints

## **2.5 Construction Workforce and Equipment**

The average estimated number of construction workers is approximately 35, with a peak of approximately 50. The general labor types required include: Machine operators, mechanics and general camp support teams that help with refueling and camp logistics.

Employees will be sourced in several ways including Help Wanted advertisement in the national news papers. In addition, recruitment centers will be set up at the inception of the project in Kaburi Village and Linden to attract local talent that are the best suited for the job. It is envisaged that many of the heavy equipment operators will come from Linden as this area has a number of operators from the bauxite industry that has just downsized again.

The required equipment and machinery for the Project construction includes excavators, dozers, front-end loaders and trucks. The machinery and equipment will be regularly inspected and maintained to ensure that they are mechanically sound and do not have fuel or lubricant leaks or unacceptable emissions.

## **2.6 Construction Schedule**

Please refer to the project schedule document in Appendix C

The Project construction is scheduled to be completed in approximately eight (8) months. Construction is planned to be done in 2-3 fronts. The construction will follow the general schedule in Appendix B. Activity will first focus on clearing, grubbing, and bedding up the subgrade for the new road sections, then moving to widening and clearing the road upgrade sections. The t-line corridor clearing will also begin using a second team. Clearing/grubbing and bedding up should continue about 6 months. After the first section is cleared, then a second team will begin bedding up the road and a third team will follow to do the capping of the road sections following in sequence. The bridge and pontoon crossing work will begin about two months into the program.

The sequence of the Project may be adjusted depending on site conditions and progress of individual work teams.

### 3 Requirements

---

The Project construction works must comply with the following Environmental, Social, Health and Safety (ESHS) requirements:

- All applicable portions of the EPA Modified Environmental Permit issued for the Amaila Falls Project [Reference 20001211-AFHP00] as adopted in the EPA Construction Permit.
- Any applicable environmental, health and safety Guyana regulatory requirement
- Applicable road design criteria and the environmental, health and safety aspects in the construction contract and specifications.
- The ESHSMP.

The Project construction works are also planned to meet the safeguard policies and performance standards of:

- Inter-American Development Bank
- World Bank Group and International Finance Corporation (IFC) The Contractor and all its subcontractors and personnel involved are required to comply with the above stated ESHS requirements.

In the event of a non-compliance the ESHSMP or unmitigated impact or risk related to environmental, social, or health and safety matters associated with the construction works, the Project Engineer shall work with the MOPWC to adequately resolve any such issue.

## 4 Prevention, Control and Mitigation Measures

---

The Project ESHS prevention, control and mitigation measures are grouped into the following categories:

- Environmental and social mitigation measures by environmental area during construction (see Appendix A for details), including:
  - Vegetation/forest clearing
  - Erosion control and storm water management
  - Road base construction and road rehabilitation
  - Quarries, source material and waste soil disposal management
  - Equipment and machinery
  - Water crossings
  - Demobilization
  - Restoration and revegetation
  - Drilling and Blasting
  - Health and safety management
  - Hazardous materials management
  - Waste management
  - Traffic management
  - Spill management
  - Emergency response
  - Labor
  - Work camps
  - Job creation and acquisition of local goods/services
  - Security management
  - Air quality
  - Noise
  - Amerindian communities

- Archaeological
- Communication
- 

Contractor recognizes that Owner (GoG) is consulting with Kaburi community to decide on the routing of the road in the Kaburi area. Prior to starting the Project access road construction at Kaburi, the Contractor will closely consult with GoG in order to understand scheduling impacts and coordinate the construction near Kaburi to reasonably accommodate GoG's discussions with Kaburi. GoG anticipates the following actions prior to road construction in the Kaburi area.

- GoG and Contractor to coordinate with the construction schedule and minimize impacts to Kaburi and to the overall Project schedule.



## **5 Monitoring and Supervision Measures**

---

### **5.1.1 Monitoring**

The Project monitoring programs for construction include (see Table 5.1 for details):

- Air quality
- Noise
- Water quality
- Waste management
- Flora/Fauna
- Erosion and storm water runoff
- Social
- EHS training
- Job creation
- Acquisition of local goods and services
- Health and safety.

The Project monitoring programs for operation include (see Table 5.2 for details):

- Air quality
- Noise
- Water quality
- Flora and fauna
- Erosion and sediment
- Social
- EHS training
- Road safety.

### **5.1.2 Supervision and Reporting**

Routine daily and weekly supervision activities (e.g., inspections, audits) and reporting thereof will be implemented by the Contractor EHS Manager and staff through an established monitoring program. Inspectors will use pre-established checklists that are to be finalized by the

EHS Manager (see Tables 5.3 and 5.4 for representative examples). The supervision and inspection activities will include checking outstanding issues and associated corrective activities taken. Supervision and monitoring reports, records, forms, and photos shall be prepared.

Monthly meetings regarding EHS matters will be held with senior managers of the Project. During these meetings, EHS performance will be discussed, and where necessary, any additional mitigation measures will be agreed upon. Additional meetings may be held in the case of an identified/reported non-compliance or the receipt of a material complaint. Any changes to the ESMP or required corrective actions that occur as a result of the management review will be implemented as soon as reasonable.

Contractor will include in the monthly report to the Owner and the EPA, any relevant EHS aspects associated with their Project activities. Routine meetings will be held with each primary contractor to discuss performance and outstanding issues related to environmental, social, and health and safety matters. The EHS Manager and staff will be responsible for supervision and monitoring of the implementation of the ESMP.

When an EHS non-conformance is detected and is not, or cannot be, immediately resolved, then a corrective action process will be initiated. The issue will be documented and sent to the appropriate Project responsible person, with a copy to the Project Manager. The cause of the non-conformance will be investigated, an appropriate corrective and/or preventive action will be recommended, along with an estimate of the time and resources needed to implement the measure. On completion of the corrective or preventive action, the EHS Manager will confirm and record all the necessary details.

Details of any contact or communications (including any complaint or demand made by a third person) with local people or Amerindian communities shall be documented and immediately communicated to a representative of the Owner and Amaila Falls Hydro Inc.

The Project Engineer shall immediately notify the Owner (including the EPA) and a representative of Amaila Falls Hydro Inc. of any material environmental, social, health and safety issue, including any complaint or demand made by any third party or person related to the Project, or if any evidence is identified of potential use of the cleared areas (e.g., movement of non-Project persons).

The EHS Manager and/or Project Engineer shall, upon reasonable request, provide a summary (which can be verbal) to the Owner/EPA and a representative of Amaila Falls Hydro Inc. of Owner related environmental, health and safety aspects, including compliance with applicable requirements and performance thereof

The EHS Manager will establish a suitable system to ensure that all relevant legal and other requirements are identified and are readily accessible to all staff.

**Table 5.1. Monitoring programs for construction phase**

---

**Air Quality**

- Construction work zones and Material Extraction Sites:
  - When working for periods exceeding 2 weeks at a time and when within 1 km of potential receptors in areas near residences or businesses, monitoring of particulate matter will be conducted to evaluate air quality impacts to off site receptors, considering the type of Project work activities and based on the wind direction (upwind and downwind).

**Noise**

- When working or periods exceeding 2 weeks at a time and when within 1 km of potential receptors near residential areas, noise monitoring will be periodically conducted to establish if noise levels are within acceptable levels. Noise measurements will determine background/ambient noise and construction noise to establish change in noise levels at receptors. Noise monitoring shall also be carried out during use of explosives (if required).
- If necessary, vibration monitoring may be required during use of explosives near residences or other offsite structures.
- Worker noise levels shall be managed with worker safety procedures, time limits near loud equipment, worker protective gear, and noise monitoring as needed.

**Water Quality**

- Domestic waste waters:
  - If a work camp discharges domestic waste water into a receiving water body or to the soil within 100 m of a receiving water body, the quality of the effluent waters after treatment will be periodically sampled.
  - For each sample, the following parameters will be analyzed: dissolved solids, pH, suspended solids, total coliforms and fecal coliforms.
- Industrial wastewater:
  - If a industrial waste water is discharged into a receiving water body or to the soil within 100 m of a receiving water body, periodic evaluations of the quality of effluents from the grease interceptors and sediment traps, thus evaluating the treatment-system effectiveness (samples to be taken at the inlet and at the outlet).
  - For each sample, the following parameters will be analyzed: pH, suspended solids, dissolved solids.
  - 
  -
- Surface water bodies at Essequibo and Kuribrong river crossings and other river/stream crossings:
  - Visual inspections/monitoring should be conducted during all activities that disturb the water quality, especially for turbidity and oil/grease.
  - In those water bodies where temporary works will occur due to bridge or other works (e.g., culverts), monitoring for turbidity (see criteria above) will be conducted at two sampling sites; one upstream and one downstream from the work site (50 to 100 m minimum, depending on the water body's mixing conditions).

- Measurements of turbidity will be collected at suitable frequencies to collect representative samples of potential impacts due to work activities. A limit of either no more than 25 percent increase in downstream sample or no greater than 100 NTU, whichever is greater, will be used to identify the need for potential mitigation actions (i.e., exceeding either limit will warrant action).
- Sediment accumulation downstream will be monitored through installation of rulers at key points of the river bed. Sediment and erosion monitoring will be conducted after the installation of the stream/river crossing features, that will demonstrate lack of erosion of the bank, stream bed, or other features near the crossing.
- For water bodies with more significant works (e.g. Kuribrong bridge), then additional periodic samples will be collected during representative periods (work activities, rain events, etc) and analyzed for: total dissolved solids, temperature, turbidity, Sampling/monitoring program should reflect the representative work activity.
- 
- At the Essequibo River barge(pontoon) crossings where works and barge operation will occur, then additional sampling will be conducted at two sites upstream/downstream (during representative periods of activities that disturb the water quality (i.e. construction of the landings, rain events, barge operation & landing) at suitable locations upstream and downstream from the activity site (depending on the water body's mixing conditions). At each sampling point, at least the following parameters will be analyzed: total dissolved solids, pH, temperature, r, turbidity,
- Drinking water:
  - If drinking water is provided to Project workers from surface waters or groundwater wells or other sources, with the exception of commercially provided bottled water, then samples will be regularly be collected (at least biweekly) and analyzed for drinking water standards.

### **Waste Management**

- Ordinary Work Camp (non-hazardous) Wastes:
  - All wastes generated will be quantified and classified by waste type, and disposed in GoG approved location and method. If approved by EPA, camp waste may be disposed underground at work camps (subject to further detail provided by Contractor and approved by EPA).
  - No waste or debris may be disposed of above ground or near any water course or drainage system.
  - In each work front, camp, industrial plant, or operating area, the location and conditions (cleanliness and signage) of the temporary waste storage sites will be verified.
  - Appropriate waste disposal site will be approved by GoG and certified with a reception record of the generated wastes by the Contractor and/or competent authority.
- Special/Hazardous Wastes:
  - Adequate storage and handling of hazardous wastes will be continuously verified, particularly with regards to use of covered and impermeable areas with secondary containment to a capacity at least 10% larger than that of the largest individual container within.
  - In each work front, camp, industrial plant, or operating area, the location and conditions (cleanliness and signage) of the temporary waste storage sites will be verified.

- All hazardous waste will be transported and disposed off site at certified/approved disposal sites. A reception record of the generated wastes by the government-authorized disposal company must be generated and kept for records.
- One site visit by EHS Manager is required to each authorized special/hazardous waste disposal company facility used during construction.
- Excess Material or Debris:
  - Depending on the quantities of excess material/debris (not ground material such as rock, soil, etc) may be disposed of at GoG approved disposal sites.
  - A record will be kept of the debris generated and disposed of, and a debris control form will be filled out.
  - At the end of every month, the debris control form will be filled out, to facilitate tracking the debris quantity generated and its disposal site. Contractor must be able to demonstrate a tracking system for all debris collected and disposed of(quantities, locations, dates, etc).

### **Flora/Fauna**

- Key aspects to be monitored during clearing will include:
  - Proper delineation and marking of work areas and areas to be cleared.
  - Compliance with restrictions on the use of tractors for clearing as per the vegetation clearing procedure
  - Effective minimization of impacts over adjacent forest areas not to be cleared.
  - Proper management and disposal of the biomass resulting from clearing.
  - Any traffic-related collisions with wildlife during construction works will be recorded.

### **Erosion and Sediment Run-off Monitoring**

- All exposed soil surfaces will be permanently prepared to receive rain and daily inspections will ensure that all applicable preventive and corrective measures are properly implemented. Key aspects to be monitored will include:
  - Proper control of rainwater flow over exposed soil surfaces.
  - Proper control of cut and fill section inclinations
  - Deployment of surface protection devices (plastic film, bio-textiles, hay bales, other) as necessary
  - Absence of loose soil stockpiles except at designated areas
  - Proper control of rainwater flow downstream of work areas until they reach the receiving natural drainage
  - Flow speed control – appropriateness of water flow speed reduction devices.
  - Appropriateness of sediment retention devices within work areas and downstream
  - Timely removal of accumulated sediment in retention devices
  - Absence of sediment accumulation in water bodies downstream (over 30 cm above baseline river bed levels shall trigger corrective action)
  - Timeliness of corrective action in general
- - 
  -

### **EHS Training**

- Monitoring of the following:

- Regularly scheduled EHS training and awareness meetings will be held with workers, including monthly tailgate safety meetings.
- Type and quantity of training sessions offered.
- Number of participants in each of the sessions offered.
- Quantity and type of EHS training for each employee.

### **Job Generation**

- Monitoring of the following:
  - Project will encourage use of local labor if qualified.
  - Number of meetings held and job offer calls conducted for labor selection and hiring.
  - Quantity and type of jobs and contracts signed

### **Acquisition of Local Goods and Services**

- Monitoring of the following:
  - Type, quantity, and cost of goods and services purchased (including the location of the company)

### **Health and Safety**

- Compliance with safe work procedures will be monitored through at least fortnightly inspections at all construction fronts. Minor observations will be observed on the field and registered for subsequent discussion with the contractor's EHS Management. Major observation may result In stop-work orders.
- As applicable, noise levels shall be monitored at any work site where workers are exposed to high noise levels above Project-specific noise limits. The location and frequency shall be determined by the EHS Manager and the extent to which workers are using personnel noise protection equipment.
- All workers' injuries will be registered. Time losses due to injuries will be investigated, including the incident's cause and identification of possible prevention measures or changes to safety procedures.

**Table 5.3. Representative example of environmental inspection items during construction**

---

1. No material has been stored outside the construction area under protection.
2. Soil/sand stockpiles have been stabilized.
3. All the workers working near the elevated works wear hard hats.
4. All the workers and employees use the necessary safety equipment.
5. The fire extinguishers are readily accessible (e.g., they are not packed in their containers).
6. Smoking or cooking near the flammable substances is forbidden.
7. Fuel is stored at the construction site, and spill-prevention measures are strictly implemented.
8. The workers use the restrooms.
9. The restrooms are clean and hygienic.
10. Construction rubbish (bags, labels, wire, plastic, tapes, etc.) has been removed.
11. Waste bins are emptied regularly according to the schedule.
12. At least one worker per day is assigned to collect wastes at the construction site.
13. The construction sites are kept tidy and clean at all times.
14. Smoking is prohibited in fueling in fuel and oil handling areas.
15. Noise impacts have been minimized.
16. All the fuel-driven equipment (pumps, generators etc.) has been fitted with leakage trays.
17. Vehicles or equipment that leaks fuel or oil is not permitted to be used at the site.
18. The equipment is fueled without any fuel leakage during the transfer.
19. The transport vehicles have been covered to prevent material spillage and droppings.
20. Traffic safety measures are implemented for the construction works near public roads/highways.
21. All the public roads are cleared of building rubble, mud, and soil due to the project.
22. All the site safety and emergency equipment is working properly.
23. The maintenance servicing of the vehicles are carried out only at designated areas.
24. Construction related waste water is not allowed to run outside the site borders.
25. Rainwater flows without any impounding/blocking.
26. The workers do not enter sensitive, fenced, or entrance-forbidden areas.
27. The EHS Manager has been notified of finding of any articles of historical or prehistoric value.
28. The sand and soil brought to the site contain no foreign or invasive plants.
29. Prior to discharging or releasing any water from the site, suspended solids (sediments) are allowed to precipitate.
30. Concrete-mixing plants are inspected by EHS Manager.
31. At the site, concrete mixing works are carried out in mixing pans.
32. Wooden formworks and panels are not allowed to be lubricated on the bare soil.
33. No concrete casting is made for unnecessary reasons (e.g., outside the mixing pans).
34. Slope instabilities have been prevented through stabilization.
35. Dust generation has been minimized.
36. Dust control is carried out by wetting, grassing, or covering the area.
37. There shall be danger strips placed around all the open excavation areas.
38. The equipment being used is not allowed to be taken outside the designated site.
39. Site access is controlled and secured.

40. At the site, regular working hours are applied.
41. All onsite accidents are properly documented.
42. All public complaints are recorded.
43. A copy of the ESHSMP is available at the work sites.
44. The works are executed in accordance with the contract, specifications, and approved ESHSMP.

**Table 5.4. Representative example of further periodic environmental inspection items during construction**

---

1. The construction areas are under protection.
2. No trees and areas under protection have been lost or damaged.
3. All the site personnel have been made aware of environmental, health and safety requirements.
4. A security officer has been appointed at the site.
5. There are first aid facilities at the site.
6. At the site, qualified personnel are available for safety, security, and first aid.
7. Emergency telephone numbers are posted in prominent places at the site.
8. Fire extinguishing equipment is available (at least 2 units per site).
9. Additional fire extinguisher necessary for "Hot works" is available.
10. Details of fire extinguisher inspections are available.
11. Water resources to be used in case of a possible fire are known in advance.
12. The workers are familiar with the operation of the fire extinguishers.
13. Bulky volumes of stored fuel have secondary containment.
14. Absorbent substances are kept ready for use in case of possible petroleum spills.
15. One sanitary waste water unit (e.g., temporary portable potty) per 15 workers is available.
16. Toilets are located at a maximum distance of 100 m.
17. The toilets are safe, and they do not leak.
18. The toilets are not placed near water bodies or drainages.
19. Sterile toilet cleaning program is available.
20. Chemicals used for sterilization and toilet cleaning do not cause any leakage when poured into the toilets.
21. At the site, there are appropriate weather proof waste bins with lids.
22. Dining areas and the sites are furnished with abovementioned waste bins.
23. Cooking and dining areas are limited to the site and dining areas.
24. All the animals naturally existing within the borders of the site have been taken under protection. (Notify the EHS Manager.)
25. If applicable, local protected plants have been protected or relocated.
26. If appropriate, vegetal soil has been stored for use afterward.
27. Opened areas have been properly stabilized.
28. Concrete mixing plants have system to prevent soil and water contamination.
29. Settling (sedimentation) ponds are available for the concrete mixing plants.
30. Detergents are not allowed to penetrate into the soils or aquatic systems.
31. No loss or damage is caused to farming or livestock activities.
32. Disturbance caused to nearby houses or business have been minimized.
33. Nearby residents and office workers are notified in advance of noise-producing activities .
34. The subcontractors are aware of the ESHSMP.
35. All the subcontractor employees have been made aware of the environmental, health and safety requirements.
36. Environmentally sensitive matters have been conveyed to the EHS Manager.
37. The ESHSMP is available at the work sites.
38. Site notifications to the employees by the EHS Manager have been posted.

### **Work Fronts**

- Work-site demarcation.
- Cleanliness and order in the working areas.
- Collection and management of generated wastes.
- Use and maintenance of portable bathrooms.
- Dust control.
- Temporary construction material storage.
- Use of personal protection devices, according to the type of activity.
- Conditions and maintenance of the equipment, machinery, and vehicles used.
- Hydrocarbons spill prevention, control, and management systems.
- Environmental protection systems used.

### **Work Camps**

- Cleanliness and order in the areas.
- Conditions and operation of the perimeter rainwater drainage system.
- Status and operation of the wastewater treatment systems.
- Collection and management of generated wastes.
- Dust and noise control.
- Signalization and demarcation of areas according to their use.
- Use of personal protection devices according to the type of activity.
- Condition and maintenance of equipment and machinery used.
- Hydrocarbons spill prevention, control, and management systems.
- Fuel storage and management.

### **Quarries and Waste Soil Disposal Areas**

- Area signalization and material containment.
- Installation and functioning of drainage systems.
- Daily control and record of the material volume dumped on each area.
- Material disposal according to each site's final design.
- Slope conditions and shaping.
- Site restoration and revegetation.
- Use of personal protection equipment according to the type of activity.
- Status and maintenance of equipment, machinery, and vehicles used.
- Hydrocarbon spill prevention, control, and management systems.
- Dust control.

## 6 Responsibilities

---

The construction contractor (Synergy) will be responsible for maintaining and implementing the Construction ESHSMP. The key personnel include the Project Manager and the EHS Manager and ESHSMP staff (to include at least two technical supporting staff/ field technicians)

The primary responsibility for implementation of the EHSMP will be with the Project Engineer. The Project Engineer shall be responsible for:

- Ensuring implementation of the EHSMP
- Appointing a Project Environmental, Health and Safety (EHS) Manager
- Ensuring that all Project workers and contractors are aware of their responsibilities and obligations related to environmental, social, and health and safety matters, and that they receive the necessary training
- Ensuring that all Project workers and contractors comply with their responsibilities and obligations related to environmental, social, and health and safety matters
- Ensuring that any non-mitigated impact or risk related to environmental, social, or health and safety matters that may arise is properly resolved
- Ensuring that adequate resources are provided to the Project to comply with all applicable environmental, social, and health and safety requirements.

The EHS Manager will report directly to the Project Engineer, having the following responsibilities:

- Ensure implementation of the ESMP by all workers and contractors
- Supervise and control such implementation, and maintain records of such
- Manage any EHS specialists and liaise and coordinate with the contractor's EHS-responsible individuals
- Report periodically on the performance of the EHSMP to Project management for the purpose of review
- Assess and approve material changes to the Project design or construction that may have an adverse environmental or social impact
- In case of any non-compliance with the EHSMP or circumstances that cause or are likely to cause serious damage and/or impacts on the environment due to the Project, immediately notify the Project Engineer and ensure that actions are taken to properly address the issue
- Train workers and contractors related to EHS matters

- Implement emergency procedures in the case of environmental incidents or worker accidents.
- In conjunction with Sithe, communicate with the general public and parties that raise issues related to EHS issues and the Project road construction.

Each of the main subcontractors will nominate a EHS representative(s). Subcontractors will be responsible for ensuring that their site staff implements the EHS mitigation measures relevant to their subcontracted works to the satisfaction of the Project Manager and EHS Manager. To ensure that each subcontractor complies with the Project's EHS requirements, each subcontractor's representative shall be required to attend EHS induction training. If Project workers or contractors fail to fulfill their responsibilities and obligations, the Project Manager or designee shall inform them of such and take appropriate actions to adequately resolve the issue. If necessary, a penalty system for EHS non-conformance shall be implemented.

## 7 Training

---

EHS training shall be provided to all Project workers. A formal training module shall be created that encompasses both standard EHS aspects but also reflects Project-specific conditions. The training module shall be approved by the Project EHS Manager. The objectives of the training are to:

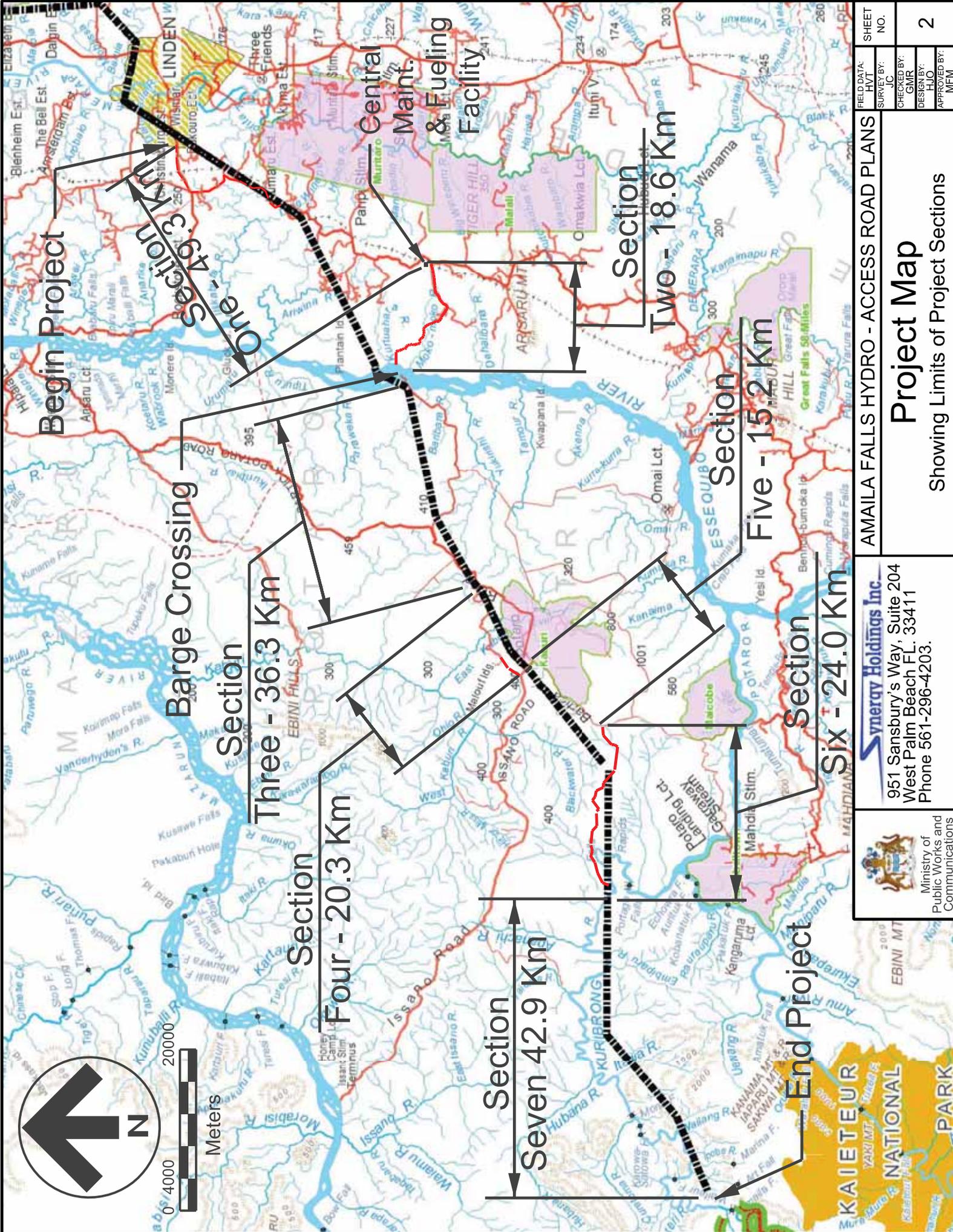
- Raise awareness among the Project personnel about the EHS issues associated with the Project, so that they can develop positive attitudes regarding each of these areas, both inside and outside the Project
- Inform the personnel involved in the Project phases about the EHS issues and obligations in the EHSMP and all Project EHS permits and regulatory requirements.

The design and development of the induction and training will consider the following issues: topic, duration, date, time, audiovisual support, location, and target personnel. The personnel that will work on the road construction and maintenance activities will receive inductions prior to their entrance to the Project. These inductions will address occupational health and safety and the environment, as well as subjects of social importance in the Project works. The training program shall be implemented periodically and distributed along the different Project activities. The participation of workers in the training shall be documented. The following are some of the topics to be considered for the training program, which does not mean excluding other subjects deemed necessary:

- EHS requirements, including the EHSMP and EHS regulations applicable to the Project and its activities
- Governmental authorities that regulate Project EHS aspects
- Protection and preservation of natural resources, flora and fauna, including emphasis on endemic and endangered species
- Vegetation preservation
- Prohibitions concerning hunting and vegetation removal
- Management of construction materials and concrete works
- Management of debris, and recyclable and domestic wastes
- Management and protection of surface water and groundwater
- Liquid waste management
- Control and management of oil and lubricants (including spills)
- Control and management of hazardous materials and wastes

- Spill prevention and response
- Signposting and traffic management
- Archaeological heritage protection
- Relationship with communities
- Hazard Identification and Hazardous working conditions
- First aid
- Emergency management
- Worker Health and Safety, including use and maintenance of the personal protection equipment, safe working procedures

Additional training will be provided for those workers involved directly in environmental and social matters or exposed to specific worker health and safety risks. A first-aid team will be established with training in emergency response.



<p><b>Synergy Holdings Inc.</b> 951 Sansbury's Way, Suite 204 West Palm Beach FL: 33411 Phone 561-296-4203.</p>	<b>AMAILA FALLS HYDRO - ACCESS ROAD PLANS</b>		SHEET NO. <b>2</b>
	<b>Project Map</b> Showing Limits of Project Sections		FIELD DATA: HVT SURVEY BY: JC CHECKED BY: GMR DESIGN BY: HJO APPROVED BY: MFM



# APPENDIX A

## ACCESS ROAD CONTRACTOR ESHMP PROGRAMS

---

VEGETATION/FOREST CLEARING	3
EROSION CONTROL AND STORM WATER MANAGEMENT	8
ROAD BASE CONSTRUCTION AND ROAD REHABILITATION	12
QUARRIES AND SOURCE MATERIAL AND SPOILS DISPOSAL AREA MANAGEMENT	14
EQUIPMENT AND MACHINERY	16
WATER CROSSINGS	17
DEMOBILIZATION	19
RESTORATION AND REVEGETATION	20
DRILLING AND BLASTING	21
HEALTH AND SAFETY MANAGEMENT	22
HAZARDOUS MATERIAL MANAGEMENT	27
WASTE MANAGEMENT	33
TRAFFIC MANAGEMENT	35
SPILL MANAGEMENT	38
EMERGENCY RESPONSE	41
LABOR	44
WORK CAMPS	49
JOB CREATION AND ACQUISITION OF LOCAL GOODS/SERVICES	51
SECURITY MANAGEMENT	52
AIR QUALITY	56
NOISE	58
AMERINDIAN COMMUNITIES	59

**ARCHEOLOGICAL  
COMMUNICATION**

**60  
61**

## VEGETATION/FORREST CLEARING

---

Vegetation clearing will be completed for the road corridor and transmission line(t-line) corridor. Only the final portion of the overall Amaila-Georgetown t-line alignment is to be cleared under this contract, i.e. between the Kuribrong River and the Amaila hydro site. Most of that section of the t-line corridor will also contain the access road corridor. In those areas the clearing of the road will be within the t-line corridor. Below describes the planned clearing approach. Appropriate adjustments may be made to the plan in close consultation with GoG and AFH, depending on circumstances as they arise.

Transmission line corridor (with no road): The t-line corridor is required to be cleared to 100 meters and in an additional 25m buffer zone on either side of the 100 meter corridor, all tall trees (over 35m) will be selectively felled. In the 25m outside buffer area, trees will be selectively cut using chainsaws and skilled operators will attempt to direct the fallen tree to land in the t-line corridor. This will minimize collateral damage to the surrounding forest. Commercial species within the entire transmission line corridor will be cut using chainsaws, dressed to become logs and stacked to one side for future removal (storage at least 10m away from clearing edge or sensitive areas).

The cutting of trees with chainsaws within the 25m buffer zones will be done by a team following the heavy equipment clearing team. The clearing within the 100m main corridor will be affected using primarily excavators. By the very nature of the rainforest, these trees are slender and very tall with a very poor, surface root system. By reaching up with the excavator bucket, these trees will be pushed over and directed to fall within the corridor. Saplings will not be pushed over. Excavator clearing will be conducted in keeping with the Heavy Equipment Safety Procedure as stated in the O&M manual and employee Health & safety manual. Multiple excavators will be staggered along the width of the corridor. Each excavator will be able to clear a 15-20m path. Trees will be push over to either side of the machines so as to clear a forward path to travel through. The excavators on the outer sides of the corridor will only push towards the center to minimize collateral damage of the forest by fallen trees.

In sections where the road does not fall within the transmission line corridor,a cleared pathway of 7 meters will be maintained within the t-line corridor to facilitate construction of the transmission towers and stringing..

In areas of flat terrain, with slopes less than 4%, all trees and brush within the corridor will be compiled into burn piles. The spoils will remain horizontally and with the canopy piled together to create burn piles and then set aflame using diesel fuel or other accelerant. In these flat areas, the ground may become grubbed up by the activity. Erosion control measures will be in place to manage storm water using the branches and logs placed perpendicular to the slope to slow down the flow.

In sloped areas, the trees and brush will be compiled into windrows and slope breakers in order to provide erosion protection. In those cases the vegetation will not be burned. Contractor will identify areas in which material will be burned and not burned, and obtain approval of GoG.

Road Corridor (outside of the t-line corridor): The road corridor is much narrower than the t-line corridor. The trees within the approximately 20m road corridor will be felled using excavators in an identical procedure as above and chainsaw teams either following or in advance of the excavators will cut commercial species and tag for later removal as logs.

Once the trees are pushed over, they will be hauled together into individual piles and the ground raked mechanically using bulldozers and front end loaders to remove the roots and leaves and other organic material and these will be placed along with the trees in consolidated piles to be burned. Diesel (or similar accelerant) will be used to facilitate burning and an excavator or front end loader will be used to monitor the burning process to ensure it is controlled. To minimize the risk of forest fires or an uncontrolled burn, deliberate breaks with a minimum separation of 20 meters between piles will be maintained. The consolidate burn piles will be no taller than 10m nor wider than 10m.

Road within the t-line corridor: This will be done as outlined for the road corridor above except that the burn piles will be placed outside of the 20m corridor for the road within the transmission line corridor.

#### **Other General Vegetation Clearing Criteria:**

Vegetation clearing and overburden removal activities shall be limited to the strictly necessary areas and shall be conducted to avoid disturbance of vegetation adjacent to the cleared perimeters. In order to achieve this, clearing of vegetation will always be preceded by a line crew that will clearly mark the limits of the area to be cleared as established in the engineering documents.

Areas considered environmentally and socially sensitive will be demarcated and signaled for protecting sites or activities that might be potentially affected by the construction, including protected flora sites or individuals, water sources, water holes, fences and pasture lands, vehicle passages and secondary access road crossings, among others. All the areas considered environmentally sensitive and demarcated within the perimeters will be cleared with chain saws. Use of tractors for clearing will not be allowed within them.

Three types of clearing procedures will be followed depending on Project locations:

- Clear-cut linear clearing, along the transmission line's corridor and/or access road corridor.
- Selective clearing of sections of the transmission line's corridor.
- Clear-cut clearing of large non-linear areas, including the camp locations, borrow pits, burn locations.

In all cases, tree felling procedures will be adjusted to fall trees towards the area to be cleared and not towards areas to be preserved.

Use of tractors for clearing will only be allowed when more than, 15 meters from any river, stream or water body, and 30 meters from any special habitat previously identified. Within those buffer zones, clearing will be done exclusively with chain saws, except at designed stream crossing. De-rooting in those areas, when necessary, will proceed only afterwards and may involve use of tractors.

In the case of access road alignments, all clearing will be with use of excavators in a similar manner as discussed above for the road alignment except these will be limited to 8 meters width. . Fallen vegetation will remain protecting the soil of the cleared areas until such time as the construction team is ready to start earthmoving. At that time, fallen vegetation will be removed and de-rooting of trees will take place. An effort will be made to minimize the time elapsed between de-rooting and conclusion of cut and fill and implementation of erosion control devices, particularly in areas of steep topography.

Along the 100 meter wide transmission line easement, de-rooting will proceed only where strictly necessary to allow for access to the transmission tower foundations or for maintenance purposes during the Project's operation. However, in flat areas use of tractors for clearing will be accepted, provided the buffer distances with regards to easement limits and water bodies as indicated above are observed.

Where the transmission line alignment intercepts flood plains, clearing will take place during dry periods to the extent possible. In these areas, all fallen vegetation will be removed before seasonal flooding occurs.

Not all of the transmission line easement will be subject to clear-cut clearing. Areas that are within the 25m buffer zone, along each side of the transmission line corridor which represent a risk of power interruptions during operations will be subject to selective clearing. This will consist of cutting only the taller trees, but maintaining a continuous or nearly continuous forest canopy of lower trees. Periodic and selective under-forest cutting (about every two years) and falling of overgrown trees will take place during operation, so as to ensure that a continuous forest canopy is maintained while forest growth is not allowed to become a risk for continuity of power transmission.

A similar approach will be adopted at river and stream crossings that intercept the transmission line easement. When valleys are sufficiently deep to allow the electric conductors to pass over the forest canopy at safety distance, riparian vegetation will be maintained untouched. Selective cutting will proceed only when necessary.

Where major non-linear patches of forest need to be cleared (reservoir and camp sites), clearing will begin at the border, with use of excavators to control the tree felling. Subsequently, each stage of the clearing plan will contemplate previous demarcation and signaling as necessary to protect streams, water holes and other environmentally sensitive areas and their established

buffers. Use of tractors and chains will be allowed in the remainder of the clearing perimeter, subject to previous flora and fauna measures mentioned above.

Vegetation removed from the alignment will be utilized to the maximum extent practicable. Commercial timber may be subject to timber sales agreements between the Contractor and the Guyana Forestry Commission GFC.

In those instances where the transmission line alignment falls within timber concessions, the concessionaires will be allowed to remove the commercial timber in a time frame agreed to between the GFC, the Contractor and the concessionaire. In those cases where the concessionaire fails to harvest that timber in advance, the concessionaire may tag and mark commercial trees and the contractor will separately stockpile them for subsequent removal by the concessionaire. Stockpile will be within the corridor and at least 10 m away from the crest of any slopes in the area. Timber not tagged by the deadline set by GFC shall be subject to the timber sales agreement between the contractor and GFC.

Vegetation cut or cleared that is not commercial grade timber will be used according to its characteristics. This may be for wooden stakes, preliminary protection works, erosion control, camp fences and other construction uses. As applicable, cleared vegetation will be used to control the discharge of sediments to streams adjacent to construction areas. Windrows will be built in sloped areas using cleared vegetation approximately 5 m from the edges of slopes adjacent to streams in construction areas.

Other non-commercial timber as well as large branches may be cut to adequate sizes for sale to industries or other establishments for use in boilers or other applications.

Tree roots will be buried at surplus soil deposit areas subject to proper compaction and in-filling with soil before any overburden is placed on top.

Non-commercial timber and large branches from transmission line clearing may be left along the alignment, positioned parallel to contour lines so as to work as slope breakers assisting to control erosion.

Along transmission line segments near agricultural areas and/or degraded areas branches and leaves may be used for bio-restoration of those areas. This will involve triturating biomass to form a mulch that will be mixed with topsoil in order to promote soil enrichment.

Elsewhere, when branches and leaves cannot be left over cleared areas, they will either be buried at surplus soil deposits or will be subject to controlled burning.

Controlled burning will consist of piling of bio-mass in areas at least 7 meters distant from the nearest remaining forest cover. In the 5 meter buffer surrounding the piles, all vegetation remains will be removed leaving a clean soil surface, to avoid spreading of fire beyond the controlled perimeter. The Contractor will be directly responsible for any controlled burning and will have fire-fighting resources in place continuously during such operations.

Alternative uses for biomass to be generated will be evaluated and implemented where feasible.

Along the transmission line alignment and at areas to be cleared for construction camps, overburden will be removed using equipment that allows for extracting only the organic horizon, without mixing it with the underlying material. The soil or organic material extracted in such a manner will be then utilized in the recovery of disturbed areas. The trees and vegetation will still be burned.

Organic overburden (top soil) to be used in bio-restoration at the end of construction shall be collected and stored in piles along the easement or along the edge of the clearings. Temporary piles of excavated or cleared soil will not be placed within 30 m of surface water bodies, in steep areas or along the flow of rainwater. All soil piles will be surrounded by containment berms to preclude the easy flow of surface runoff and sediment from soil piles. The containment berms will be constructed of soil pervious enough to enable the passage of surface runoff water while trapping sediment contained in that runoff. The height and slope of each soil pile will be such that foundation and slope failures do not occur.

### **Barrier Effects Mitigation:**

The corridor for the road and transmission line in areas of primary and secondary forest will create new continuous forest edges. Edge and barrier effects will be more relevant to the Sections 6 & 7 where only slightly disturbed and pristine primary forest formations dominate the landscape. By contrast, increases in habitat fragmentation may be more relevant to areas between Kaburi and Georgetown with the cumulative effect increasing in areas where human activities have already altered the landscape. The occurrence and intensity of impacts created by new forest edges (Powerhouse to Kaburi) and increased fragmentation (Kaburi to Georgetown) will be monitored by the GoG activities planned in the Project environmental and social management program. In addition, several management practices may be implemented to minimize the barrier and fragmentation effects. Some of these measures to be implemented by Synergy include:

- Maintain a shrub habitat with low vegetation in portions of the transmission line corridor in Section 6 & 7. This may help mitigate the barrier effect for many ground dwelling species.
- Establish low vegetation wildlife corridors or crossings at selected locations along the transmission line cleared corridor and road that may help mitigate impacts to larger fauna.
- Include extra space under the road culverts and bridges that may provide a pathway for fauna when streams are below max levels. As possible, these should provide space for wet and dry fauna passages. A low vegetation corridor will be provide along the stream leading out to the edge of the overall road & transmission line corridor.
- Avoid clear cutting low valleys and streams in the transmission line corridor where adequate overhead clearance is available above the low canopy vegetation.
- Where possible, use low fences (or other features) to guide fauna towards the passages under culverts and bridges.
- In low flow streams, adjust access road project to avoid fill sections at crossings.
- Consider narrowing the corridor in sensitive habitate areas, especially in areas such as savannahs and wetlands, where the natural vegetation is already below the transmission line overhead clearance requirements.

Synergy will work with GoG to determine which areas along the corridor should be targeted.

## **EROSION CONTROL AND STORM WATER MANAGEMENT**

---

The design of storm water management measures will be based on studies of rainfall intensity frequency data to determine the appropriate design storm for the construction operation, including the surface drainage requirements. Information will include capacity, elevations, and condition of existing affected drains. Topography, size, and shape of drainage area, and extent and type of areal development, profiles, cross sections, and roughness data on pertinent existing streams and watercourses; and location of possible ponding areas will be determined. In addition, information regarding soil conditions, including types, permeability, vegetative cover and depth to and movement of subsurface water will be obtained. Runoff records for drainage areas contiguous to the project area and having similar characteristics and soil conditions will be utilized to size surface runoff management structures.

Structures for erosion and sediment control will be installed as conditions require. Runoff from construction sites will be controlled to prevent erosion and resultant sedimentation of receiving waters. Runoff will not be discharged from construction sites in quantities or at velocities substantially above those which occurred before the commencement of construction works. Replacement of existing inadequately sized bridges will substantially increase flow, but will return stream flows to proper parameters.

Site clearing operations will progress in a gradual and phased manner to ensure there are no large increases in sediment discharge.

While permanent erosion and sediment control structures are not installed, temporary structures will be implemented throughout the construction process as necessary to ensure that all exposed soil surfaces are always ready to receive rain. These structures will be designed for a 5-year design flood where they control small drainage areas (i.e. under 10 hectares), and 10-year design floods in all other cases.

As a rule, all exposed soil areas surfaces will be tilted towards cut sections and, where this is not possible, berms will be installed at the limits of fill sections to minimize uncontrolled storm water flow over inclined surfaces. Inclination of all cuts and fills will be rigorously controlled and will at no time be allowed to be greater than the inclination established in the road's final design.

All flow of storm water over exposed soil surfaces will be along pre-established paths that will not interfere with vehicle and equipment circulation and will contain Soak aways and other devices to control flow velocity. Hydraulic stairs, drop structures or other energy dissipation structures will be used whenever storm water needs to be conducted to lower grounds.

Temporary detention ponds will be installed both within the exposed soil surfaces and immediately downstream as necessary to avoid sediment run-off beyond the construction footprint's limits. Discharge from these ponds will be channeled through a sediment control structure constructed of a matrix of stone, sand and grass to remove sediment prior to discharge to surface water bodies. All ponds will be periodically cleaned of accumulated sediment and will

be installed at locations where they can be easily accessed with a backhoe or similar piece of machinery..

Maximum use will be made of existing ditches and drainage features. Grading operations will progress downhill on the basis of 20 cm to 30 cm layers in a way that maintains horizontality of the grading platform., Temporary ditches will be used to facilitate construction drainage. Efforts will be concentrated on roadway subgrade excavations and base courses to prevent detrimental saturation. Careful considerations will be given to the drainage of all construction roads, equipment areas, borrow pits, and surplus soil deposit areas.

Erosion control will be provided by increasing the interval between soak aways and by rock filled bags for the more severe cases and by ground cover vegetation where turbulent flow is not expected. Logs will be placed in a staged fashion to slow runoff. Other forms of erosion protection such as rock filled bags, flowering foliage or soil filled bag barriers will be considered in special cases.

During the progress of the ROW clearing and grading, and particularly during rainy seasons, the conditions of the installed preliminary works for drainage and stabilization will be checked, to detect possible faults and perform the corresponding corrections.

Construction operations will be thoroughly monitored for sediment loads discharge to receiving surface waters.

All streams and water bodies that receive run-off from the construction footprint will be monitored for sediment accumulation. This will make use of rulers installed at key river or stream bed locations. Any accumulation of over 30 cm of run-off will trigger corrective action that will be based on manual removal of sediments. Submerged pumps may be used but no heavy equipment requiring clearing of riparian vegetation will be deployed.

Definitive (permanent) hydraulic structures discharging into open channels will be provided with riprap protection or equivalent to prevent erosion. Riprap protection will be provided adjacent to all hydraulic structures in erodible materials to prevent scour at the ends of the structure. The protection will be provided on the bed and banks for a sufficient distance to establish velocity gradients and turbulence levels at the end of the riprap approximating conditions in the natural channel. Riprap or equivalent will also be used for lining the channel banks to prevent lateral erosion and undesirable meandering. Consideration will also be given to providing an expansion in either or both the horizontal and vertical direction immediately downstream from hydraulic structures such as drop structures, energy dissipaters, culvert outlets, or other devices in which flow can expand and dissipate its excess energy in turbulence rather than in a direct attack on the channel bottom and sides.

Riprap can fail by movement of the individual stones by a combination of velocity and turbulence, movement of the natural bed material through the riprap resulting in slumping of the blanket, and undercutting and reveling of the riprap by scour at the end of the blanket. The

design will therefore develop an adequate size stone, use of an adequately graded riprap or provision of a filter blanket, and proper treatment of the end of the riprap blanket.

The riprap design will provide a gradual reduction in riprap size until the downstream end of the blanket blends with the natural bed material. The thickness of the riprap blanket may be doubled at the downstream end to protect against undercutting and unraveling or alternatively a constant-thickness rubble blanket of suitable length dipping below the natural stream bed to the estimated depth of bottom scour will be provided.

Permanent erosion control on the roadway itself and on the transmission line alignment will be accomplished by the wind-rowing of clearing debris to form natural siltation barriers. terracing along with a re-vegetation program. The terraces will consist of a low, broad-based earth levees constructed approximately parallel to the contours and will be designed to intercept overload flow before it achieves great erosive force and to conduct it to a suitable discharge point. Organic material that was previously stripped will be respread over the cleared area to provide humus and seed material for germination and natural regrowth.

All storm drainage will be discharged via surface drainage systems. Maximum use of natural drainage features will be considered. Runoff from roads and other cleared areas will be collected in open channels or ditches i.e. soak aways for removal from the immediate area. The use of buried pipe will be minimized and buried pipes will be daylighted to open channel drains as soon as practical. The use of area drains and box inlets in pavement areas will be minimized, and collection piping under roadway pavement systems will be as short as possible.

Drainage pipes will be used to convey water through or under a roadway, or some obstructions. Drainage pipes will be of plain or non-reinforced concrete, PVC or corrugated polyethylene or galvanized metal culvert. The factors which will be considered when selecting the type of pipe will include strength under either maximum or minimum cover, pipe bedding and backfill conditions, anticipated loadings, length of pipe sections, ease of installation, resistance to corrosive action by surrounding soil materials, suitability of jointing methods, provisions for expected deflection without adverse effects on the pipe structure or on the joints or overlying materials, and cost of maintenance.

Culverts and storm drains on steep slopes will be sufficiently large, so that full pipe flow can never occur to maintain the hydraulic gradient above the pipe invert but below crown of the pipe and thereby reduce the tendency for infiltration of soil and water through joints.

In those instances where the service road and transmission line are to be constructed in areas of undulating topography, cut and fill operations would be minimized. Slopes would be engineered in cut and fill area to incorporate preferential drainage courses or culverts. Culverts installed for the service roads will be lined with gravel to prevent erosion. Vegetation removed during construction will be used for soil conservation and erosion control.

All cut slopes will be 3:1 or flatter (or as per construction specs if more stringent) to avoid instability due to wetness, to provide fill material and allow vegetated slopes to be mowed.

Fill slopes will be 2:1 and will be placed in layers not to exceed 12 inches in depth and compacted (or as per construction specs if more stringent). Temporary diversions will be maintained at the top of this fill slope at all times, and the filling operations will be graded to prevent overflow. Filling will be done as a continuous operation until final grade is reached.

Sediment traps will be constructed around material stockpiles to prevent sediment from entering channels. Windrows of cleared vegetation will be constructed around all construction areas to slow down the flow and act as silt traps/barriers. Should the disturbed areas adjoining the channels not be stabilized at the time the channels are vegetated, a sediment fence will be installed adjacent to the channel to prevent channel siltation.

In the sites where surface water erosion is observed, erosion control measures will be implemented.

In the zones where the slope grade must be changed due to the highway geometric design or presence of unstable zones, it will be necessary to evaluate the construction of runoff control works, such as top ditches, ditches, collection channels, and drains with energy dissipaters. The discharge of the collected runoff to natural drains will be built with using a suitable erosion control.

Dust emitted from construction areas will be controlled by sprinkling with water if necessary during dry periods.

## **ROAD BASE CONSTRUCTION AND ROAD REHABILITATION**

---

The vehicles used for material transportation in populated areas will be equipped with a cover for ensuring that the load placed remains contained and no spill or material loss (e.g., dust) occurs during transportation.

The transported load will be totally covered when operating in populated areas to avoid spreading, emissions, or leaks. The cover will be a resistant material to avoid breaking or tearing.

During loading and unloading operations, vehicles must be totally stopped. The machinery, equipment, and vehicles used in this activity will be checked periodically and duly synchronized, to control air emissions and avoid mechanical faults.

The sites for temporary material storage must be located at appropriate distances from existing water bodies and courses, and Placed in areas to limit dispersion.

Material storage will not be permitted in water body zones (streams, rivers, lagoons, spring heads, etc.).

The material storage areas and temporary stockpiling sites will be demarcated and isolated

Periodic irrigation with water for keeping the surfaces wet and controlling dust emission will take place during dry periods.

No waste will be left at the road sides; it will be collected by a maintenance team every week at the end of work.

Vehicle or equipment maintenance will be allowed outside of the dedicated areas but shall be done in a manner to prevent possible soil and ground water contamination and all waste materials shall be collected and transported to an acceptable GoG approval disposal facility.

During the cutting, backfilling, and leveling activities, the cut material with the best mechanical properties will be used for backfilling, while the low-technical-specifications material will be dumped in the excess excavation material disposal sites authorized for the Project. In the sections where the suitable excess material from excavation might be insufficient, the required volumes will be extracted from borrow pits duly permitted by governmental authorities.

Excess soil will be temporarily stored separately and transported to designated waste soil disposal areas.

In areas with hydro-geological sensitivity, special attention will be given to the cutting methods used and their possible effects on secondary fracturing, and changes in aquifer (surface or subsurface) drainage patterns in the area of influence.

As necessary, temporary and permanent erosion and sediment control measures will be installed (see Erosion Control and Storm Water Management Procedure).

At the end of the construction period, the ground shall be leveled so as not to cause any sedimentation or erosion and contoured to the surrounding natural areas and natural drainage shall be established.

Areas outside the 20m wide cleared roadway shall be recovered with stockpiled topsoil and seed material from the clearing process and allowed to re-vegetate naturally with local plant species that are indigenous to the area after the completion of construction.

Upon completion of the works within any area, including in particular any temporary camps, the area should be fully cleaned of all debris, waste and rubbish including temporary structures, surplus material, equipment and tools.

## **QUARRIES AND SOURCE MATERIAL AND SPOILS DISPOSAL AREA MANAGEMENT**

---

All areas excavated to obtain materials for construction will be contoured to conform to the natural topography of the areas. Top soil removed from these areas will be set aside prior to excavation and will be replaced over the area after excavation to facilitate future revegetation.

The criteria for selecting borrow pits or quarries must give priority to those located near the work area or in its vicinity, including the inactive or abandoned zones.

Whenever the opening of a new borrow pit or mine would be necessary, the contractor shall obtain all necessary regulatory permits and approvals prior to any work.

New quarries will be opened only in areas where the exploitation activities do not affect wildlife, water courses, or other sensitive or fragile features.

All material quarries shall be approved by the Project Manager and be authorized by applicable regulatory authorities.

All transport of materials shall use only the Project-designated routes/roads, and damages caused by the movements of Project-related vehicles and equipment shall be repaired.

The technical design and operation of the quarry exploitation will include:

- Specifications for slope management, ensuring the zone's stability during the exploration and after the area abandonment.
- Designing drainage works for ensuring runoff water drainage and management, to avoid erosion or instability problems, as well as preventing sediment transport to the surface bodies of water.

An evaluation will be made of the zones that could be used as surplus soil disposal sites, taking into account the following recommendations: location outside of ecologically sensitive areas and/or high economic importance; sites that do not obstruct the natural drainage and are at least 100 m away from any water body; and when possible, using existing natural hollow areas or former soil extraction zones (abandoned pits), which in no way might interrupt the surface water flow.

Environmental management measures described for clearing, overburden removal, erosion and sediment run-off control and operating equipment and machinery, will apply at all quarries and surplus soil deposits.

If disposal areas are required then definitive design will include the particular geometric specifications for material disposal according to topography, internal and external drainage systems, and the necessary reconfiguration and revegetation plan for the final closure of the area. Final design will consider maximum capacity, shaping (slope stability), soil compression, and

terrace slopes, as well as the surface and subsurface drainage, and final revegetation  
Where previously approved, surplus soil disposal areas may be used to bury tree roots or other excess biomass resulting from forest clearing.

The disposal area will be marked/demarcated , where necessary, to demarcate the filling areas according to the established program, and to avoid the material dispersion at ground level due to water or wind action.

During the filling process, the waste soil material will be compressed to minimize water accumulation, increase the dump's capacity, and provide general stability.

For controlling infiltration and runoff in the dump, drainage will be constructed to control runoff.

Once the dump is full, surface restoration and an adequate site closure procedure will be conducted. For the restoration, all the material from the right-of-way clearance and overburden removal will be used. Also, internal and external stability will be ensured by means of all the necessary procedures.

## **EQUIPMENT AND MACHINERY**

---

The equipment and machinery used for construction of the access road will be in good operating conditions, and will be properly maintained for controlling emissions and avoiding possible mechanicals faults during operation that could lead to oil, lubricant, or fuel leaks at the work site.

All the work fronts shall be equipped with systems for prevention, control, and cleanup of fuel or oil spills due to failure of the equipment or machinery used.

Refueling, oil changes, or maintenance to equipment and machinery will be carried out using the appropriate refueling equipment such as pumps with shut off nuzzles, etc to prevent spills. Care will taken during refueling to prevent spills. When equipment breaks down, the needed repairs will proceed only after implementing the spill prevention, control, and cleaning systems specified by the best environmental management practices for this type of activity. .

Temporary storage of equipment, hazardous materials, chemicals, fuels, oils, and lubricants will be located at an approximate distance of at least 100 m from any body of water, and will be protected with a system for erosion and sedimentation control and mechanisms for avoiding soil pollution.

## **WATER CROSSINGS**

---

The water course occupation for bridge construction will be planned according to the hydraulic designs and the historical behavior of the course. The course channeling works will be conducted in the most favorable way for the project and respecting the river's hydraulic behavior.

If possible, the water course intervention shall be planned for dry seasons or low river flows, to avoid disturbance to the water flow, transportation of excavation material to the course, and scour phenomena.

The bridges will be built following the topographic and bathymetric surveys to be conducted during the detailed engineering studies, permitting, as far as possible, foundations with adjacent pile groups.

If required then the dikes for shaping channels will be built with bed material, piled with a machine, and partially compressed so that the maximum elevations channel the flow to those sectors favorable for the work. The final location of these dikes will be determined locally, depending on the river's hydraulic conditions observed immediately before their construction.

As an additional protection, longitudinal defenses will be built along the uncovered sides of the embankment protection. The soil from excavations and residues from construction materials and consumables will be piled at a distance greater than 20 m from river banks, and as much as possible, they will be transported in the same day to the final disposal sites.

After finishing the foundation of every pile or pier stage, the dikes will be demolished and the river bed will be shaped to resemble, as far as possible, its conditions prior to channeling. For restoring the river course at the end of this activity, the initial photographic record will be consulted.

Temporary diversion of minor rivers and streams that will be crossed through fill sections over culverts will be preceded by careful alternatives analysis to ensure the diversion is as short as possible and is placed on the side where impacts will be smaller. Measures to avoid turbidity and sediment transport and other water quality impacts during the diversion period will be proposed. In general, these measures may include isolating the water body from the building work through use of synthetic mesh, berms or other types of barriers.

Calculation for estimating the channel or diversion work's dimensions will be based on 5 year floods. Diversion designs will need to be approved by the Project Engineer before proceeding.

Once the diversion is implemented, any necessary soil substitution along the river (stream) bed will proceed, and sand, stone and gravel will be placed as necessary for settling the definitive culvert. Cutting and filling activities in the valley leading to the culvert will only be allowed to start after the culvert is in place and the diversion has been closed. Exceptionally, the Project

Engineer may allow anticipation of cut and fill during dry periods.

Waste disposal to surface waters will be forbidden.

Dumping any kind of industrial waste, such as solvents, used oils, paints, or other material, to surface waters will be prohibited.

In case of a contingency or accident due to a hydrocarbon or other substance spill, immediate cleaning activities will be conducted to control and remediate the problem.

## DEMOBILIZATION

---

During dismantling of the work camps and temporary facilities like machinery and equipment storage areas, etc., all the temporary structures will be removed, to restore the area to conditions similar to the original. Soil and organic soil stored during the camp and temporary structure installation will be used.

The appropriate transportation means will be provided for transporting the structures, equipment, machinery, etc. Transportation of wastes, fuels, and others, will be conducted with corresponding precautions and safety measures for avoiding accidents and environmental pollution.

All of the temporary concrete structures will be demolished, and debris will be removed and properly disposed of in the authorized places.

In the zones with potential soil contamination, hard zones and lined systems will be removed, verifying that no soil pollution is present.

In the event of soil contamination with fuel or other products, the contaminated soil will be removed and replaced by clean soil. The contaminated soil will be disposed of by a government-authorized facility/company, in compliance with IFC General EHS Guidelines.

The residues of channels or covered ditches and hard zones will be removed and disposed of. All the liquid and solid wastes (including grease traps and sand removers) will be collected and treated to attain acceptable conditions, and will be disposed of according to the management methods established for this type of waste.

All of the treatment systems will be closed and removed from the site.

Once dismantling and cleaning of temporary facilities is over, a detailed inspection will be conducted to evaluate the scope and needs of the environmental restoration to be performed at each site for its definitive closure. This will include inspection of all permanent drainage structures and removal of any accumulated sediment. Similarly, any sediment accumulation downstream will be verified and corrective action will be required as necessary.

All the road and service structures that may have been damaged during the construction activities will be reconstructed until conditions are acceptable to the owners. Evidence of acceptance of this work will be part of the Project commissioning.

A general cleaning of the constructed highway and right of way will be conducted, removing debris and other wastes that might contribute to contamination of soils or nearby water bodies, or might reduce the effectiveness of restoration in vicinity of the highway. Final disposal of the debris and wastes from this cleaning will be conducted according to the materials' characteristics.

## **RESTORATION AND REVEGETATION**

---

Restoration and revegetation of lands should begin as soon as their disturbance is over, or when the necessary engineering works are finished.

A revegetation plan will be developed based on the final project design, in particular based on the characteristics of the areas to be revegetated.

Soil reconditioning should be done as necessary to ensure optimum recovery of the vegetative cover.

Physical and chemical characterization of surface substrate should be performed. If no substrate is available, an organic soil layer will be incorporated.

In slopes (cut and fill sections), an anchoring system consisting of geomembranes will be considered when necessary.

The revegetation process will be implemented after completing the geotechnical works planned and designed for the zone rehabilitation (pits, cut slopes). Revegetation shall consist of reusing the stored topsoil layer and seeds removed when the initial clearing took place and stockpiled. This will be carefully respread over the now cleared area to allow for revegetation with native plant varieties.

Application of agricultural amendments and fertilizers will be used as necessary; for example, to ensure suitable rooting of the vegetative material.

## **DRILLING AND BLASTING**

---

Prior to any blasting, a more detailed Blasting Plan will be developed and reviewed with Owner, and necessary Guyana permits will be obtained. Ensure that suitably experienced staff, under the supervision of an explosives expert licensed and certified by the applicable governmental authority, are utilized for any such works.

Ensure that necessary actions are taken to prevent flying rock and reduce fugitive dust generation, to the satisfaction of the HSE Manager. At a minimum, an area within 30 m of the blasting shall be wet to reduce dust.

No blasting shall be carried out when strong winds are present.

Blasting (including storage and handling of explosives) shall be conducted in accordance with the applicable regulatory requirements, which shall be made readily available to all staff and shall be explained via toolbox talks and scheduled training to all personnel directly involved in blasting operations.

A check of the area shall be conducted directly prior to every scheduled blasting, to ensure that all personnel have been evacuated of the safety buffer zone, and this shall be followed by a clear warning siren before blasting begins.

Any communities within 10 kilometers will be previously informed of the blasting procedure, the blasting schedule and the meaning of the siren.

## HEALTH AND SAFETY MANAGEMENT

---

Proper safety procedures and personal protection equipment (PPE) appropriate to the task at hand will be provided to all workers.

PPE to be provided depending upon the nature of the work task to be performed, will include:

- Full length pants;
- Safety shoes Safety glasses with side shields as needed;
- Work gloves;
- Hearing protection for workers in close proximity of noise generating equipment

Hard hats

When using chainsaws, axes, etc.

- Leg protectors;
- Safety footwear;

Other equipment and supplies to be made available to workers include:

- Insect repellants
- Snake bite kits
- Sun barrier creams
- First Aid kits

Where there is an imminent danger to the safety of workers, the employer should take immediate steps to stop the operation and evacuate workers as appropriate.

A worker shall have the right to remove himself from danger when he has good reason to believe that there is an imminent and serious danger to his safety or health, and he has a duty to inform his supervisor of such immediately.

Provisions for worker welfare include an adequate supply of drinking water, sanitary and washing facilities (separate for men and women), facilities for changing and for the storage and drying of clothing, and accommodations for eating meals and for taking shelter during interruption of work due to adverse weather conditions.

All minor and loss time accidents will be documented as required by the Ministry of Labor. Reports of industrial accidents or fatalities will be reported to the Ministry of Labor when required by law. All accidents will be investigated and documented, with as a minimum, the following information:

- Name of person involved
- Name of injury
- Place of injury

- Description of accident
- Type of accident
- Reason for accident
- Corrective measures (as warranted)

Serious injuries will be referred to a medical practitioner and medical institution. The medical institution and practitioner will be chosen from the nearest town/village to the operations and contact will be maintained by radio/radiophone at all times. A four wheel drive vehicle will be available at all times to respond to accidents.

Prior to start of work, arrangements will be made for medical facilities and personnel to provide prompt attention to the injured. An effective means of communication) with emergency access or other emergency response source and transportation to effectively care for injured workers will be provided. Communication devices will be tested in the area of use to assure functionality. The telephone numbers of physicians, hospitals, and/or ambulances will be conspicuously posted at Georgetown and other regional offices delineating the best route to the nearest medical facility will be prepared and kept with the Project Manager

A first-aid kit complying with the criteria contained in American National Standards Institute (ANSI) Z308.1-1998 shall be provided at all work camps and work crews onsite at all times.

The supervisor/manager will:

- Inspect all machines and Equipment for the existence of potential hazards and ensure that they are in working order.
- Inform the worker of any hazards present.
- Instruct the employee in the correct safe work procedure to prevent injuries and ensure that those instructions are followed
- Provide the necessary safety protective gear when required.

In accordance with OSH Act 1997 employees will be authorized to do the following:

- Cease work once a hazard is perceived.
- Report the hazard to the supervisor who will in company employer's safety representative inspect the condition or circumstance and determine its validity.
- Obey the instruction to perform alternative work or cease work completely as directed by the supervisor.
- Return to the workstation or proceed once the hazard has been adequately dealt with or eliminated.

The Safety Manager will monitor hazards and work conditions. He will do the following:

- Perform Safety Inspections on and off the operations site on a regular and programmed basis (at least once per month) for the detection of unsafe conditions or any potential hazards and report these hazards to management.

- Record all minor and loss time accidents in a ledger as required by the Ministry of Labor (Table 2 shows the format to be used for recording industrial accidents).
- Remit reports of industrial accidents or fatalities to the Ministry of Labor when required.

Adequate training will be provided to employees, contractors, and subcontractors, to ensure that all personnel are qualified on health and safety. Employees will be educated about their responsibility to participate in the creation of a healthy and safe environment by: reporting unsafe and hazardous conditions when detected and performing work in a safe manner by following the correct work procedure.

The company will run periodic training program in:

- Basic first aid programs (all employees).
- Poisonous snake, spider and insect identification.
- Advanced first aid programs
- Accident investigation & reporting seminars (supervisory personnel & safety reps.)

The basic first aid program will be extended to all employees and would be geared to ensure that in the event of an accident or injury, someone with first aid knowledge will always be present to render initial assistance until further medical attention can be made available. Qualified personnel will run seminars to impart the necessary theoretical as well as practical skills required. These courses will be scheduled depending on employee strength and attrition.

The advanced first aid program will constitute an upgrading course from the basic first aid program in which selected employees including supervisors and the Safety representative will be exposed to advanced first aid knowledge and techniques which will enable them to participate in the recognition and the initial management of serious injuries and illnesses e.g. Fractures, Spinal Injuries, Malaria, Yellow Fever, Dengue, Typhoid fever, etc.

Serious injuries will be referred to a medical practitioner and medical institution. The medical institution and practitioner will preferably be chosen from the nearest Town/Village to the operations and contact will be maintained by radio/ radiophone at all times.

The following measures will be implemented in order to decrease or eliminate inhalable dust inhalation and prevent any adverse effects on workers:

- Provision of dust respirator with filters to employees exposed during the excavation and transportation of ore
- Siting of living quarters a convenient distance from the operations site and on the windward side of same.
- Minimal denudation of vegetation around campsite.

Workers in the excavation and transportation phases of the operations would be exposed to windblown/fugitive dust being blown into the eyes and causing eye irritation and conjunctivitis. These employees will be provided with clear goggles and eye wash lotion will at all times be available for washing the affected eyes.

The following measures will be implemented to address worker health and safety related to noise associated with the operation:

1. Control of noise levels at source via installation of silencers on exhaust system of power generating plants.
2. Provision of hearing protection to employees exposed to high noise levels: ear muffs for employees in the maintenance shops and generating plant areas.
3. Earplugs for employees who operate heavy-duty machines.
4. Warning signs in areas of high noise levels instructing employees to wear earmuffs or earplugs as required.

In order to minimize the risk of malaria and other diseases transmitted by mosquitoes, all camp accommodations will have available bed nets treated with insecticides.

Prior to start of work, arrangements will be made for medical facilities and personnel to provide prompt attention to the injured and for consultation on occupational safety and health matters. An effective means of communication (hard-wired or cellular telephone, two-way radio, etc.) with emergency response source and transportation to effectively care for injured workers will be provided. Communication devices will be tested in the area of use to assure functionality. The telephone numbers of physicians, hospitals, and/or ambulances will be conspicuously posted at the on-site project office telephones and a map delineating the best route to the nearest medical facility will be prepared and posted at each work camp.

If a medical facility or physician is not accessible within 5 minutes of an injury to a group of two or more employees for the treatment of injuries, at least one employee on each shift will be qualified to administer first aid and CPR. Individuals who are required to work alone in remote areas will be trained in first aid and provided an effective means of communication to call for assistance in the event of an emergency.

All the necessary arrangements will be made at the medical posts to have ambulances available during Project construction, in case of emergencies requiring immediate hospitalization.

All project activities on which less than 100 persons are employed (greatest total number of employees on a shift) at the site of the work, and where neither a first-aid station nor infirmary is available, shall be provided with a first-aid kit complying with the criteria contained in American National Standards Institute (ANSI) Z308.1-1998 in the ratio of one for every 25 persons or less. In addition to the basic fill requirements a health care professional or competent first aid person, will be retained to evaluate the hazards in the work environment to determine the necessity of optional fill contents.

When any part of the body may be exposed to toxic or corrosive materials, drenching and/or flushing facilities will be provided in the work area for immediate emergency use. When persons are exposed to epoxy resins, solvents, hydrocarbons, cement, lime, or other dermatitis-producing substances, ointment recommended by the manufacturer for the specific exposure will be available and will be used.

Employees designated as responsible for rendering first aid or medical assistance will be included in a blood-borne pathogen program and shall be instructed in the sources, hazards, and avoidance of blood-borne pathogens and be provided the training requirements, be provided with, and shall use and maintain PPE (i.e., CPR barrier, gloves, gowns, masks, eye protectors, and/or resuscitation equipment) when appropriate for rendering first aid or other medical assistance to prevent contact with blood or other potentially infectious materials.

Prior to the start of work, the employer shall inform employees of prevention steps, symptom recognition, and medical assets available if they are traveling to remote areas known to be a potential source of disease transmission such as Dengue Fever, Malaria and other vector-borne diseases.

First-aid kit locations should be clearly marked and distributed throughout the project area. The contents of first-aid kits will be checked by the safety officer prior to their use and at least weekly when work is in progress to ensure that expended items are replaced.

Each construction/work team will have at least one designated first aid person trained in emergency response procedures and equipped with all necessary phone numbers. These persons will also have access to a satellite phone or other communication device capable of accessing help. These employees will be trained in CPR procedures and emergency wound care.

Occupational safety and health written procedures will be prepared and made available to project workers, for the following minimal elements:

- General Instructions
- Responsibilities
- Accident Prevention
- Safe Forest Clearing
- Hazard Identification Information
- Personal Protection Equipment
- First Aid
- Fire Prevention and Protection
- Hazardous Material Handling (including petroleum products)
- Signs, Notices, and Barricades
- Camp Hygiene and Sanitation
- Tree Felling Safety Procedure
- Hand-Operated and Power-Operated Tools
- Blasting and Explosives Use
- Machinery and Vehicle Equipment
- Work in/near and Over Water

Fire extinguishers, first aid, and emergency response supplies will be available at all the work sites, with clear signs identifying their presence.

## **HAZARDOUS MATERIAL MANAGEMENT**

---

Hazardous materials include gasoline, oil and petroleum products, waste oils and grease and chemicals. All hazardous materials will be stored only in approved containment vessels.

Hazardous materials will be located and stored for protection against sunshine and rainfall and to prevent accidental release that may result in contaminated run-off and leaching. All storage areas for hazardous material will be covered and will be founded on impervious surfaces with a berm on the perimeter so as to constitute secondary containment in the event of spills. Capacity of secondary containment will be at least 110% that of the largest hazardous product container stored.

Material Safety Data Sheets (MSDS) will be kept on site and appropriate measures taken to contain spills of hazardous materials shall be in accordance with the procedures therein. Incompatible substances that can react upon mixing to generate heat, fire, gas, explosion, or violent polymerization will not be located within proximity of each other.

Temporary storage of equipment, hazardous materials, chemicals, fuels, oils, and lubricants will be located at an approximate distance of 200 m from any body of water, and will be protected with a system for erosion and sedimentation control and mechanisms for avoiding soil pollution.

Oil changes, or maintenance to equipment and machinery will only be allowed in dedicated and prepared areas at construction camps. Refueling/repairs in the roadway and transmission line clearing will only be allowed in the case of breakdowns or small repairs and will be conducted implementing the spill prevention, control, and cleaning systems specified by the best environmental management practices for this type of activity.

Containers for hazardous chemicals will be labeled or tagged with the identity of the substance and appropriate warning markings. Areas where hazardous materials are stored or used around the construction site will be kept free from accumulations of materials that create a hazard, such as leaking containers, or placement of containers in a manner that would create hazards such as tripping, fire, or pests. Hazardous substances that if stored together may create a fire hazard will be separated.

Hazardous materials should be used only in accordance with the instructions given in the Material Safety Data Sheet (MSDS). Personal protective equipment and clothing will be worn while dispensing or using chemicals, where necessary. No rainfall shall be allowed to percolate through areas where hazardous materials are stored and no uncontrolled run-off will be permitted from these areas. Storage locations shall be properly marked and/or identified. Chemical storage areas shall be well lit and ventilated. No open flame, smoking, or any type of localized heat is permitted near the chemical storage area. Mixing of chemicals shall be done outside the storage area. Large bottles and containers shall be stored on shelves no higher than two feet above the floor. Containers of chemicals shall be kept below eye level. Enough space shall be provided to avoid overcrowding. All empty bottles shall be removed from stock-room shelves. Storage containers shall be inspected regularly for rust, corrosion, or leakage. Any incompatible

chemicals shall be physically separated from each other.

No smoking will be allowed at or near any hazardous materials storage area.

Small quantities of solvents, paints, and lubricants shall be stored inside the site workshops for use principally in onsite maintenance and repair of construction equipment.

Containers of flammable combustible liquids will be stored and handled so not to damage the container or label, block exits, or create a fire hazard. Storage cabinets for hazardous materials will be fire resistant and will be labeled FLAMMABLE - KEEP FIRE AWAY. No more than 60 gal of Class I or Class II liquids and no more than 120 gal of Class III liquids can be stored in a cabinet.

Containers of flammable/combustible liquids may be stored outside if located at least 20 ft from buildings . The storage area will be graded to divert spills or will be surrounded by a slight berm.

An optimum store of essential equipment for oil spill clean-up will be maintained on-site within a dedicated container. Oil absorbent materials shall be hauled away from the construction sites and shall be incinerated at facilities approved by the EPA. Contaminated soils will be stored in drums and would be disposed offsite.

Gas (LPG and oxyacetylene) cylinders will be secured against falling over and stored in an area removed from camp. Cylinders will be stored away from direct or localized heat or flammable sources; valves will be closed on all empty gas cylinders; and secure valve caps will always be in place when storing or moving cylinders. Gas cylinders shall not be lifted by the valve cap. Exposure to any naked light will be prohibited and reasonable precautions will be taken to ensure that no person smokes or exposes any naked light in the immediate vicinity of the stores while the dangerous stores are open. No repairs shall be carried out in the stores unless all explosives have been removed. Proper precautions shall be taken to prevent unauthorized persons gaining access to the stores; maintain adequate security.

Petroleum products shall be stored in a manner consistent with governmental regulatory requirements. Fuel and lubricants storage will comply with the following:

- The fuel-storage tank area will possess a containment dike with the corresponding valves, and a storage capacity of 110% of the volume of the tank(s) it contains. The dike's internal area will be lined with an appropriate impervious material such as sheet plastic.
- Limit the zone to be occupied to the minimum required area, considering the operation and safety needs.
- The zones occupied by the fuel storage area will be signalized, clearly indicating to the personnel the type of activities that they can conduct in this area, precautions to be taken, maintaining demarcation of the zones for working, consumables storage, and machinery and vehicle operation.
- 
- Avoid any contact with water bodies; to that purpose, it is necessary to close the rain-water drains located in vicinity of the storage zone.

- A suitable spill containment system shall be designed; periodic revisions must be scheduled to identify the repair needs of the containment walls or dikes.
- The lubricants storage tanks will be placed on wooden palettes for avoiding tank corrosion.
- For avoiding oil and fuel spills, pumps will be used for unloading the volumes to be used from the main storage tank.
- An inventory will be kept for controlling the fuel and lubricants, specifying their use or destination, in order to facilitate further identification of oily and lubricant waste sources.
- The vessels will be kept tightly closed and duly identified and marked in order to avoid leaks, spills or accidents.
- The fuel storage area must be equipped with a fire-fighting system.

No underground storage will be allowed.

A list of hazardous materials stored at each storage site will be maintained and provided to the EPA.

Employees will be provided with written information about hazardous chemicals to which they are exposed. Personnel who work with hazardous materials will be trained in the use of and potential hazards of such materials. All employees and supervisors working in sites where there is a likelihood of exposure to hazardous materials or other hazards will be trained before engaging in these activities.

A suitable number of portable fire extinguishers will be kept on site and precautions will be taken to prevent ignition. Storage facilities will be maintained and operated to control leakage and prevent accidental escape of flammable/combustible liquids.

NO SMOKING signs will be distinctly displayed in areas of compressed gas storage to prevent fire.

Hazardous material will be transported in such a manner as to ensure protection of all communities and the environment during transport. Clear lines of responsibility will be established for all aspects of transport including the safety, security, release prevention, personnel training and emergency response procedures in event of unplanned releases. The Construction Manager will identify personnel responsible for each aspect of hazardous material transport. The transport aspects will include as follows:

- packaging & labeling
- storage and security at port of entry,
- transport to the operation,
- unloading at the operation,
- safety training
- security during transport,
- emergency response during transport.

The Emergency Response Plan addresses spill response scenario during transport to the site.

Warning signs will be posted on all transport equipment alerting workers of the presence of hazardous material and that smoking, open flames, eating and drinking are prohibited. In addition, workers will be required to wear hazardous material specific personal protective equipment. Security measures, such as lockouts on valves and fenced and locked storage of solids, would be provided at all transshipment points and at interim storage sites.

High-risk sections of routes to construction sites, such as river and stream crossing and areas of highly pervious soil, will be identified and evaluated to determine the need for special precautions in these areas. Applicable governmental/EPA/CDC transportation related and emergency response procedures will be considered to prevent and respond to any releases during hazardous material transport.

The company road safety program for all hazardous material transport vehicles will include, but not be limited to, vehicle and tire inspections, preventive maintenance, limitations on drivers hours, tie-down procedures for solids, and procedures by which transportation can be suspended if severe weather conditions are encountered. Vehicle operators will retain records to document that these activities have been conducted. The company will also implement inventory and/or chain of custody documentation procedures to identify the loss of any hazardous material during transport.

All transport vehicles will be provided with emergency communications capability as best as the available communications backbone will allow to ensure timely communication. Any spills/releases will be immediately reported to the Construction Manager who will immediately inform all potentially impacted communities, relevant government agencies and the company's designated emergency response team.

The contractor will design and construct unloading, storage and mixing facilities consistent with sound and accepted engineering practice and will employ quality control/quality assurance procedures and spill prevention and containment measures to protect workers and the environment during hazardous material handling and storage.

To the extent practicable, all unloading and storage areas for hazardous material will be located away from people and surface waters. Where this is not practicable, the potential for release to surface water and/or human exposure associated with the storage location will be evaluated and the operation would implement protective measures to prevent or minimize these potentials. The protective measures will include additional containment structures and specific emergency procedures for evacuation and response.

Unloading of all hazardous material will be done on an impervious surface that can prevent leaks from coming in contact with the environment. An automatic level indicator, high-level alarm, or integrated tank and tanker valve-shutdown device will be provided on all hazardous material storage tanks to prevent overfilling. Direct observation of tank levels or use of a manual gauging rod will be done to prevent overfilling of hazardous material storage tanks.

Workers not directly involved in hazardous material operations will be prohibited from accessing hazardous material storage areas by a fenced boundary or by storing hazardous material within a separate fenced and locked area.

Tanks and pipelines will be clearly identified as containing hazardous material. The direction of flow will also be indicated on pipelines. Hazardous material specific first aid and emergency response equipment will be readily available for use at unloading, storage and mixing locations. Workers involved with unloading, storage and mixing of hazardous material would be trained in the use of emergency rescue equipment and in the first aid procedures for responding to hazardous material exposures.

Spill neutralization and clean-up equipment would be available for use at unloading, storage and mixing locations. This will include water for cleaning spills of liquid hazardous material, shovels for cleaning up spills of solid hazardous material, and chemicals to treat or neutralize hazardous material and hazardous material -contaminated soils, as well as hazardous material -specific personal protective equipment. Personnel engaged in unloading, storage and mixing activities would be trained in the operation's procedures to respond to hazardous material spills, including notifications, clean up and detoxification.

Storage areas, pipelines, pumps, valves and tanks will be inspected at least once monthly for evidence of leakage, presence of solution in secondary containments and integrity of the containment. Deficiencies will be noted and records would be retained documenting the inspection and the implementation of necessary corrective measures.

Empty hazardous material containers will not be reused on or off the construction site for any purpose other than holding compatible hazardous material.

All hazardous material related facilities will be inspected on an established frequency sufficient to assure and document that they are functioning within design parameters. Tanks holding hazardous material will be inspected for structural integrity and signs of corrosion and leakage. Secondary containments will be inspected for their integrity, the presence of fluids and their available capacity, and to assure that drains are closed and, if necessary, locked, to prevent accidental releases to the environment. Pipelines, pumps and valves will be inspected for deterioration and leakage. Retention ponds will be periodically inspected to ensure available freeboard and the integrity of embankment.

Facility inspections will be documented on inspection forms and in log books and will include the date of the inspection, the name of the inspector, and any observed deficiencies. The nature and date of corrective actions will also be documented.

Preventive maintenance programs will be implemented to assure the continuous functioning of equipment and devices that are necessary for hazardous material management. Pumps, pipelines, and hazardous material holding facilities will be regularly maintained so that failures do not result in worker exposure or releases to the environment. Preventive maintenance activities will be documented.

The operations will have a source of emergency power for pumps and other equipment when their primary power supply is interrupted to prevent unintentional hazardous material releases and worker exposures. Back-up power generating equipment will be maintained and tested to ensure its availability if needed.

Operators undertaking operations involving hazardous material use will wear appropriate protective clothing. Workers will wash their hands before eating, drinking or smoking. Contaminated protective gear and clothing would be securely discarded, or washed before being stored and re-used. Operators will be encouraged to work in the presence of camp personnel so as not to be handling to HAZMAT when alone.

Should an operator be exposed to hazardous material, effective and timely medical care will be provided. All personnel will be required to be familiar with the treatment procedures for personnel affected by hazardous material exposure.

## **WASTE MANAGEMENT**

---

Waste management options shall be applied based on the following hierarchy: avoidance and minimization, segregation and reuse, and treatment and disposal in accordance with relevant laws and good practice.

Non-inert materials, such as wood, glass, plastics, steel and metals shall be recycled to the extent possible, and if recycling is not possible, then the waste shall be disposed of in a government-authorized landfill or facility.

Areas of impervious soils will be identified on the alignment and solid wastes exclusive of food and other organic wastes will be landfilled in these areas where the depth to the water table exceeds 5 m and will be covered with at least 1 m of impervious soils. Water table levels will be established manually by digging test pits in areas identified as potential waste disposal sites. Waste pits will be developed to ensure that the maximum freeboard between the pit base and the water table is maintained. These solid waste containment areas shall be designed in accordance with guidelines provided by the EPA

General refuse and litter shall be stored in garbage disposal pits as defined by the Guyana EPA and Guyana Forestry Commission guidelines. Workers will receive training on waste classification and segregation.

No type of waste will be allowed to accumulate at construction fronts and all wastes will be periodically removed to the dedicated waste storage areas at the construction camps.

Food waste and organic matter will be collected and initially disposed of in bins by canteens or other eating areas. Subsequently, they will be taken to the Waste disposal pits. All organic waste will be buried in accordance with EPA rules

Bins for temporary waste storage will be covered at all times to control flies, rodents and other vermin/vectors.

Cleared vegetation will be disposed of as per the Vegetation / Forest Clearing Procedure.

Paint residues, lubricants, and other oily wastes shall be classified as hazardous wastes, and special controls shall be imposed to regulate the storage, labeling, transport, and disposal of such chemical wastes. All empty packaging / containers of hazardous products will also be treated as hazardous waste. Medical wastes will also be considered hazardous.

All works areas shall be cleaned of general litter and refuse as needed but at least weekly.

No sanitary wastewater shall be disposed in or immediately near any surface water body. Pit latrines will be constructed at construction fronts in accordance with the Guyana Forestry Commission (GFC) Code of Practice for Timber Harvesting and the Guyana national Bureau of

Standards (GNBS) Draft Standard for Ventilated Improve Pit Latrines (VIPs). VIPs will be periodically treated with limestone. Sanitary wastewater generated at camp facilities waste will be treated for compliance with IFC EHS guidelines and will then be disposal of in accordance with the Guyana National Bureau of Standards regulations.

Oily wastewater from maintenance areas will pass though oil/water separators and will then be directed to temporary detention ponds. Detention facilities will be sized to contain the design rainfall event and to eliminate the likelihood and frequency of overtopping which may degrade surface water quality. The detention ponds will be located in areas of impervious soils to minimize infiltration to groundwater. All water from the oil/water separators will be skimmed prior to discharge. **Residual/waste oils will be disposed in keeping with the Hazardous Waste Management Plan.**

Indiscriminate dumping of waste oil will not be permitted under any circumstances.

Waste oil will be stored in suitable containers at designated points. If used oil is stored in a tank then it shall have a secondary containment system that will hold 110% of the tank's capacity. Oil shall be collected by a government-authorized recycling and/or disposal company on a regular basis. All waste oil storage area will be provided with secondary containment to deal effectively with any leakage or spillage.

All other miscellaneous hazardous wastes shall be collected separately in suitable drums, temporarily stored in a secured, demarcated, and bermed area of 110% capacity, and then collected and disposed of (in accordance with the relevant Material Safety Data Sheet) on a regular basis by an experienced government-authorized disposal company.

Manifest and chain of custody procedures will be utilized to track the removal and disposal of all solid waste. A log will be prepared of all material removed from each bin and the approximate quantity. These forms will be delivered to the landfill and will be signed by a receiver at the landfill indicating that the quantity of material received at the landfill corresponds to that cleared from the collection facilities.

All vehicles carrying waste from the Project shall have properly fitting side and tail boards, and the materials being transported shall be securely covered.

## TRAFFIC MANAGEMENT

---

All drivers of Project vehicles will obey all country driving requirements.

All workers will use approved transportation.

No Project construction vehicle shall be used to transport local residents, except in case of a medical emergency.

No Project vehicle shall be used to carry more passengers than the vehicle is designed to carry.

The Company will enforce speed limits of less than 50 km/hr by its equipment on the roads under construction and 30 km/hr on haul and service roads.

Construction works will be conducted in a manner as to offer the least possible obstruction to the safe and satisfactory movement of traffic over the existing roads during the life of the contract.

If project personnel are working on publicly used roads, construction activities will not commence or continue until all signs, devices and barricades are in place and operational in accordance with the requirements of the Ministry of Transport (MoT).

All new roads constructed under this Project will be closed to public use. Unless otherwise approved by Owner, for the entire duration of the road Project, only authorized traffic for the road Project or for Amaila Hydropower Project may use the new road sections. Contractor will install suitable barriers at entrances to new road sections, and provide manned security check points to prevent non authorized entry.

On upgrade road sections, the Contractor will provide, erect, maintain, and remove all traffic signs, barricades, and other traffic control devices necessary for maintenance of traffic. All barricades, warning signs, lights, temporary signals, other devices, flagmen, and signaling devices shall meet or exceed the minimum requirements of the MoT. The Contractor shall coordinate with the MoT and obtain approval from local authorities prior to closing or restricting access on any existing road. Barricades, danger, warning and detour signs, as required, will be erected before any roads are closed.

Devices and signs no longer required shall be promptly and completely removed from road user's lines of sight. Repositioning of signs and devices will take place to accommodate the progress of the construction works.

All signs will be in accordance with MoT guidelines and symbolic signs will be fluorescent. Prior to installation all signs will be checked for damage and cleanliness and repaired, replaced or cleaned as necessary. Signs and devices will be erected in accordance with locations and spacings determined by the MoT such that:

- They are properly displayed and securely mounted;

- They are within the driver's line of sight;
- They cannot be obscured from view;
- They do not obscure other devices from the driver's line of sight;
- They do not become a possible hazard to vehicles; and
- They do not deflect traffic into an undesirable path.

Pedestrian crossing points will be clearly identified in built up areas on the road and will be located in areas where there is a clear line of sight of at least 100 m.

Access/haul roads will be designed in accordance with engineering criteria. The contractor will not move, or cause to be moved, any equipment or vehicle upon an access or haul road unless the roadway is constructed and maintained to safely accommodate the movement of the equipment or vehicle involved.

When road levels are above working levels, berms, barricades, or curbs shall be constructed to prevent vehicles overrunning the edge or end of embankment. Berms/curbs shall be constructed to one-half the diameter of the tires of the largest piece of equipment using the roadway.

Roadways shall have a crown and ditches for drainage. Water shall be intercepted before reaching a switch back or large fill and be led off.

Haul roads shall be constructed to widths suitable for safe operation of the equipment at the travel speeds proposed by the Contractor and accepted by the MoT. All roads, including haul roads, will be posted with maximum speed limits. An adequate number of turn-outs shall be provided on single lane roads haul roads with two-way traffic. When turn-outs are not practical, the Contractor will provide a traffic control system to prevent accidents. Whenever possible, use a left-hand traffic pattern on will be used on two-way haul roads.

All curves will have open sight line and as great a radius as practical. Vehicle speed will be limited on curves so that vehicles can be stopped within one-half the visible distance of the roadway. The design of horizontal curves will consider vehicle speed, roadway width and surfacing, and super elevation. When necessary, based on grade and machine and load weight, machines will be equipped with retarders to assist in controlling downgrade descent. Truck haul roads will be kept to less than a 10% grade and the maximum allowable grade will not exceed 12%, except for short sections (maximum 200 meters) grades up to 20% shall be acceptable. Any two sections of road at maximum gradient shall be separated by 100 meters of level gradient.

Roadway hardness, smoothness, and dust control shall be used to maintain the safety of the roadway. All roads will be maintained in a safe condition to eliminate or control dust and similar hazards. The deposition of mud and or other debris on public roads will be minimized to the extent possible and in accordance with MoT requirements.

Traffic Controllers will wear high visibility vests, in addition to other protective equipment required at all times while directing traffic and will comply with the requirements of the MoT and will ensure no activity is undertaken which will endanger the safety of other road user.

In the event of an accident all traffic will be halted to avoid further deterioration of the situation. First Aid shall be administered as necessary, and medical assistance shall be called for if required. For life threatening injuries an ambulance shall be called to the accident location. The Police will also be called for traffic accidents where life threatening injuries are apparent. Any traffic crash resulting in non-life threatening injury will immediately be reported to the Police.

Broken down vehicles and vehicles involved in minor non-injury crashes will be temporarily directed to the verge of the road as soon as possible after details of the crash locations have been gathered and noted. Details of all incidents will be reported to the Police.

The road contractor will prohibit and control unauthorized (e.g. public) traffic on the new road construction by blocking the road with the trunks of trees felled during the clearing operation (at at minimum at the turn-off from Mabura Hills road and the turn-off from the Bartica-Potaro road). Signs will be posted in advance of these restrictions indicating that access to the road is prohibited.

An access control station will be installed at point on Bartica-Potaro road just south of the Issano Junction. Contractor will consult with GoG to determine if control point must be manned. If unmanned, a birm or gate with a lock shall be used to prevent unauthorized use.

To the extent in use during construction, the access road barges on Essequibo River and Kuribrong River will be limited to only Amaila Hydropower Project related transit

An access control committee will be established by the Project developer and/or Government consisting of relevant Guyana government entities (e.g., Ministry of Public Works, Forest Commission, Mining Commission, Amerindian Affairs, Police/Public Safety, etc.) to control and monitor access via the road to the area west of the Bartica-Potaro road.

## **SPILL MANAGEMENT**

---

Spill management deals with spills of hazardous materials include gasoline, oil and petroleum products, waste oils and grease and chemicals.

An internal communication system will be maintained by the contractor to summon external assistance (telephone or two-way radio).

Portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment will be maintained at strategic locations, by the contractor, to respond to spills.

Remedial and notification procedures will be implemented if there are any spills during construction activities. Immediately after a spill non essential site personnel will be evacuated from the spill area if the spill poses a risk to their health.

All spills will be contained by deploying equipment to construct an earthen berm around the spill. If the spill can result in a fire all combustibles/ignition sources such as running engine will be removed from the vicinity of the spill. Soils contaminated by spills will be excavated from the spill area and disposed in accordance with the Hazardous Materials Management Plan.

Spills of fuel oil will be responded to by the addition of surfactants and by retrievals with skimmers. Other chemicals, which cannot be recovered manually, chemically or by mechanical means will be allowed to naturally degrade by dilution and dispersion. During the degradation process water quality would be monitored in the spilled area. After monitoring determines that water quality has attained acceptable standards, sensitive fauna will be allowed to naturally reenter the area.

Spills of fuel oils will be cleaned by mechanical methods, chemical dispersants, gelling agent or biological agents. The specific method to be used will depend on the quantity and location of the spill.

When possible, mechanical cleanup, using booms and skimmers, will be used to recover spills to surface water. Containment boom would be used to control the spread of spilled product and to concentrate the product in thicker surface layers to make recovery easier. In addition, booms will be used to divert and channel oil slicks along desired paths, making them easier to remove from the surface of the water. Skimmers would be used to recover spilled oil from the surface of the water. Skimmers will be either self-propelled or operated from the bank of streams/creeks.

Chemicals dispersants will be used to accelerate the breakup of fuel oil and refined product spills to surface water. Dispersants would be applied immediately following a spill, before the lightest materials in the oil have evaporated. The use of dispersants in freshwater would be authorized by the Emergency Response Coordinator only if it does not pose any threat to human health or the environment. Gelling agent will be used to respond to small spills of fuel oil. Gelling agents will be applied by hand to small spills and would be left to mix on their own. The gelled oil would be

removed from surface water using skimmers. Biological agents will be used to mitigate the impacts of oil spills to surface water and to soils.

In the events that spills to surface waters affect fauna, individuals will be trapped and will be relocated to areas within close proximity of the site, which are the same ecologically as the spill area. Fish will be trapped with nets and animals will be snared in traps designed to ensure that animals are not injured during trapping.

All soils impacted by the spills will be excavated from the spill area and disposed in accordance with the hazardous waste management procedure.

Surface water and soil samples will be recovered from the impacted areas after cleanup to ensure that residual levels of hydrocarbons and other fuel oil constituents do not exceed tolerable limits. If these limits are exceeded in soil, additional soil will be removed from the spill area until the residual levels fall below tolerable limits. The soil excavated from the area shall be disposed in accordance with the Hazardous Waste Management protocol. If surface water quality has not been attained, monitoring will be continued. Persons downstream of the spill will continue to be provided with clean water until water in the affected area again attains acceptable water quality. If the spill results in contamination of an underlying aquifer, a detailed investigation will be conducted to define the contaminant plume and a cleanup plan will be prepared.

The Company will maintain an Emergency Response Center (ERC) at a strategic location in the project area. A Primary and alternate Emergency Response Coordinator will be located at each ERC. Each coordinator will have explicit authority to commit the resources necessary to implement the Emergency Response Plan (ERP). Emergency response teams would be identified and would be appropriately trained and prepared. The ERP shall include call-out procedures and 24-hour contact information for the coordinators and response team members.

All personnel involved in operations would be trained to recognize and respond to situations which can result in releases to the environment. The training will include identification of procedures to be followed if a release is discovered, including notification of the appropriate site personnel, measures to assure worker safety, and methods to stop or contain the release, if possible.

The following list of equipment and supplies will be provided for response to emergencies.

1. Earthmoving Equipment
2. Mobile Generators
3. Sand and Gravel
4. Sand Bags
5. Pumps
6. Pipes
7. Booms
8. Absorbents

All transport vehicles will be fitted with absorbent material and vehicle operators will be provided with a radio to maintain contact with the emergency response centers. If there is a spill/leak of fuel oil or other hazardous material onto roadways during transportation to/from the site prompt action will be taken to contain the leakage or spillage. All combustibles/ignition sources such as running engine, likely to result in fires will be removed from the vicinity of the spill and anyone in the area will be advised to stay upwind of the spill. Absorbent material in the transport vehicle will be used to cover small spills. The vehicle operator will immediately notify the Emergency Response Center which will assign an Emergency Response Coordinator to respond to the emergency.

## **EMERGENCY RESPONSE**

---

This procedure relates to potential emergencies such as fires, personnel accidents, etc. (see Spill Management for release/spill of hazardous materials including petroleum products).

The Company will maintain an Emergency Response Center (ERC) at a strategic location in the project area, complete with suitable communications equipment (satellite phones, radios, etc). A Primary and alternate Emergency Response Coordinator will be located at each ERC. Each coordinator will have explicit authority to commit the resources necessary to implement the Emergency Response Plan (ERP). Emergency response teams would be identified and would be appropriately trained and prepared. The ERP shall include call-out procedures and 24-hour contact information for the coordinators and response team members. Communication details (telephone numbers/ radio patch numbers, etc.) for medical facilities/personnel/police, etc. will be provided/posted at all camps and work fronts, and will be reflected in the Contractor's ERP procedures. ERP procedures will be established in keeping with the guidance obtained from the Guyana Civil Defense Commission (CDC) Within 24 hours(or sooner if appropriate) of an emergency event, the Contractor will notify Owner, Amaila Falls Hydro, and appropriate Guyana authorities (including the EPA and the Guyana CDC) of the event and the response and planned follow up actions.

All personnel involved in operations would be trained to recognize and respond to situations which can result in releases to the environment. The training will include identification of procedures to be followed if a release is discovered, including notification of the appropriate site personnel, measures to assure worker safety, and methods to stop or contain the release, if possible.

The following list of equipment and supplies will be provided for response to emergencies.

1. Earthmoving Equipment
2. Mobile Generators
3. Sand and Gravel
4. Sand Bags
5. Pumps
6. Pipes
7. Booms
8. Absorbents

If there is a fire, water and/or chemical fire suppressant shall be used as fire suppressant. In the event of a forest fire caused by natural forces, the GFC representative will advise on how to handle/proceed.

If an explosion has occurred, all workers should be immediately evacuated from the immediate area of the explosion. Appropriate measures shall be implemented to address any damage or increased risks that result from the explosion.

During the emergency control phase, the emergency coordinator will take all reasonable steps necessary to ensure that explosions and releases do not occur, recur, or spread to other areas. These steps will include, where applicable, stopping operations. The emergency coordinator would monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever appropriate. Details would be provided to emergency personnel concerning the types of on-site emergency equipment to be used and the need for personnel protection equipment.

Immediately after an emergency, the emergency person would provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material. The recovered material would be handled as a hazardous waste unless it is a characteristic hazardous waste only, which is analyzed and determined not to be hazardous. The emergency coordinator would ensure that in the affected areas, no waste which may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed. All emergency equipment would be cleaned and made fit for its intended use before operations are resumed.

In the event of an industrial accident the following protocol will be followed:

- A basic first aider will be summoned if not already present at scene of accident.
- The basic first aider will render first aid care.
- The basic first aider will summon an advanced first aider who will administer further care if necessary and evaluate the necessity for further offsite treatment.
- The advanced first aider will summon a vehicle identified for this purpose and supervise the removal of the injured person.
- The employee's immediate supervisor will be informed. He will:
  - Make contact with the identified medical Practitioner and Institution and inform them of the time of arrival of the injured employee.
  - Complete the accident form and forward same along with the injured to the medical institution for completion by medical practitioner
  - Inform the Safety representative who will record the accident in the Industrial accident register.

The Company will maintain the following equipment as a minimum for use in an evacuation vehicle:

1. oxygen cylinder and gas masks resuscitation equipment,
2. accommodation for a first aid personnel to ride with the injured,
3. a flashing light attached to warn other road users,
4. communication equipment.

All work areas will be provided with a radio to maintain contact with the emergency response centers.

All first-aid, safety, and emergency response equipment will be inspected periodically

Closure of the emergency will be notified to all relevant parties by the emergency coordinator once all steps described above have been completed. As pertinent, the emergency coordinator will prepare a report on the emergency, its root causes, and corrective actions.

## LABOR

---

All those working on and visiting the Project will behave in a transparent and honest manner and will act with a high degree of personal and professional responsibility while carrying out any activity associated with the project.

All those working on and visiting the Project will not discriminate under any circumstances based on gender, age, race, language, culture, political or religious affiliation, disability, or other factors.

The following worker/labor rights shall be provided:

- Freedom of association and protection of the right to organize include the following:
  - Workers have the right without prior authorization to establish or join a representative organization of their choosing.
  - Worker organizations shall not be dissolved by administrative authorities
  - Worker organizations have the right to establish and join national worker federations and confederations.
  - Project management should encourage and promote measures for voluntary negotiation of employers and employer organizations with worker organizations, with a view to regulating employment terms and conditions through use of collective bargaining agreements.
  - Worker representatives shall enjoy protection against any prejudicial acts, including dismissal, relating to their status or activities as worker representatives, so long as the activities of the worker representatives conform to national law.
- Forced labor:
  - Forced and compulsory labor is prohibited.
  - Forced and compulsory labor must not be used for political coercion or punishment for holding or expressing political or ideological views; labor discipline; punishment for having participated in strikes; or racial, social, national, or religious discrimination.
- Non-discrimination:
  - The Project must ensure a policy of equal opportunity for all job candidates and all workers.
  - All workers shall receive equal remuneration for work of equal or equivalent value, without discrimination based on gender, ethnicity, age, disability, political opinion, trade union affiliation, or social origin.
  - Workers shall not be subject to distinction, exclusion, or preference in relation to training, promotion, retirement, or employment termination on the basis of race, ethnicity, gender, religion, trade union affiliation, political opinion, disability, national extraction, or social origin.
- Child labor:
  - The Contractor shall not employ any person under 18 years of age or the minimum age, and shall keep a register of names and ages all persons employed on the Project.

The Contractor shall pay the work force at least the nationally established minimum wage, in a timely manner and at regular intervals. [Note: consideration should be given to whether the legally established minimum wage enables Project workers to meet their (and their families') basic needs and should also be guided by the cost of living in the locale.]

All workers shall be hired under written contracts [unless otherwise necessitated by the job circumstances].

The Contractor shall ensure that permanent work staff, as well as contract and subcontract workers, are not recruited or hired through private employment agencies as a means for circumventing respect for the rights of freedom of association, organization, and collective bargaining or other core labor rights.

The Contractor will also ensure that all workers receive a written copy of their contracts, stating the employment terms and conditions and their right to review their personnel files and correct inaccurate information.

The Contractor shall pay all overtime in accordance with the national or other legally established hourly rate of overtime.

The Contractor should ensure (either via host-country systems or other means) adequate medical care and sickness benefits for all Project workers, including seasonal workers, casual labor, apprentices, foreign migrant workers, part-time workers, and those on short-term contracts who may be excluded under national law from receiving full or any benefits coverage.

Adequate potable water for human consumption shall be supplied to Project workers.

The Contractor will institute a stern policy to prevent and protect against discrimination in employment in accordance with the Protecting Against Discrimination Act cap 99:09. The Contractor will ensure that no employee is discriminated against in the terms or conditions or employment afforded to him/her; in the conditions of work or in occupational safety and health measures; in the facilities or provisions related to employment; or by limiting or denying access to opportunities for advancement, promotion, transfer or training or to any other services, facilities or benefits associated with employment.

The Contractor will not tolerate any acts of sexual harassment against an employee committed by any other employee, managerial employee or co-worker.

To minimize influx to the work area, hiring centers (or employment phone lines) will be established in areas such as Georgetown and Linden. Qualifications for all positions will be clearly stated. Qualified individuals from indigenous communities and other communities in proximity to the project will be encouraged to apply to optimize local content. The Contractor will establish dialogue with leaders of local communities to understand employment needs and expectations and create strategies to generate local employment. Qualified individuals from indigenous communities and other communities in proximity to the project will be encouraged to apply to optimize local content.

Persons under the age of eighteen will not be recruited.

The contractor will try to recruit unskilled employees such as the cook, cleaners and security staff from the surrounding community. The contractor will have final say as to whether an employee is qualified or not. The employer will mount training programs and apprenticeships for local residents to boost local labor supply and will promote and reward motivated individuals who successfully graduate from the training programs. The Project will have open days for local suppliers and will maintain a register of local suppliers and the goods these suppliers provide. The Contractor will pursue actions to enhance capabilities and capacity building in the surrounding areas through on the job education and training programs. The services of the MAA and indigenous peoples NGOs will be utilized to identify individuals who may be potentially hired for work on the project.

The contractor will actively discourage influx into the area and not allow outsiders to settle in the periphery of its construction camp.

Workers will be provided food and lodging in the field while on the job. Workers who become incapacitated by sickness or accident during the journey to the work site or a worker who dies during to the work site will be returned to their homes by the Contractor. The Contractor will comply to pay at a minimum, the minimum rate of wage payable prescribe by the Minister. In instances where rates of wages have not been prescribed, the Contractor will pay wages to persons employed at a rate agreed upon. Records of wages will be maintained with respect to person employed as required under the Labor Act. Equal remuneration will be paid to men and women performing work of equal value.

Employees will be informed at the time of the job offer whether payment is by task or day and the rates for the task or day. Wages will be paid in full, exclusive of sums lawfully deducted, and entirely by money only on working days at the work site. The Contractor will comply with the hours of work set out by the Ministry of Labor. Payment will be at regularly scheduled paydays and paysites as the local camps are not allowed to carry cash.

Every employee will be allowed a period of holidays with pay, after a probationary period, in accordance with the Guyana Holidays with Pay Act cap 99:02. Temporary or day laborers will not be entitled for holiday pay. The Contractor will determine the date on which the holidays will commence taking into account any special request by employees. Upon termination of employment the Contractor will pay a sum equal to wages which would have accrued for the period. Records of holidays with pay for employees will be maintained in accordance with the Act.

The Contractor will provide the Ministry of Labor or any of its designated officers information regarding wages, hours and conditions of work of those employed. Designated officers of the Ministry of Labor will be allowed to carry out examination, test, or enquiry which he may consider necessary to satisfy himself that the provisions of the Law relating to the employment of persons are strictly observed.

A Notice containing such provisions of the Labor Act will be displayed at a conspicuous place where it can be easily read by employees.

The contractor will train its personnel on site to handle influx sensitively without conflict or security issues and will also promote and run health awareness campaigns especially on HIV and STD amongst the workers as well as local communities within proximity of its operations.

Employees will be informed of the grievance procedure and ground for termination. Grounds for termination will include non-compliance with this Labor procedure, hunting and harvesting of the area biodiversity resources, disturbance of archeological remains, interaction with unauthorized service providers (e.g. sex workers), interaction of weapons or use of illicit drugs in the construction area. Policies will be established to ensure the enhancement of capabilities and capacity building within the work force.

Termination of employment as a result of death of an employee will be done without prejudice to legal claims of the employee's dependants or personal representative. The Contractor during the probation period of new employee reserves the right to terminate employment at any time during the probation period for any reason and without notice. The vice versa shall apply to employees as well. Termination of employment due to redundancy will be in accordance with the Guyana Termination of Employment Act cap 98:08.

Employees guilty of serious misconduct, i.e. conduct which is directly related to the employment relationship and has a detrimental effect of the Contractor business, will be summarily dismissed. The Contractor may take other forms of disciplinary action other than dismissal in the form of warning letters and/or suspension without pay.

In keeping with the Termination of Employment Act cap 98:08 dismissals will not be based on the following grounds outlined below or any other specified in the Act.

- An employee's race, sex, religion, color, ethnic origin, national extraction, social origin, political opinion, family responsibility, or marital status.
- A female employee's pregnancy, or reasons for her pregnancy.
- An employee's absence from work because of sickness or injury certified by a registered medical practitioner.
- An employee's participation in industrial action in conformity with the provisions of any law.

The Contractor will ensure that all measures and procedures outlined under the Health and Safety Act cap 99:10 are carried out and that all employees performing duties at the worksite comply with the Act, and that the safety and health of workers on the construction site are protected.

Training will be provided on labor related areas, such as health and safety, emergency response, etc. The Contractor will also promote and run health awareness campaigns especially on HIV and STD amongst the workers

The Contractor will provide the following levels of insurance prior to commencing works. Insurance coverage shall consist of at least the following:

- Employer's Liability Insurance.
- General Liability Insurance, for Bodily Injury, Property Damage and Personal Injury. General Liability insurance policy must (i) be written on a Commercial Form; (ii) include Premises/Operations, Independent Contractors, and Products/Completed Operations coverages; (iii) include broad form contractual liability coverage.
- Comprehensive Automobile Liability - for bodily injury and property damage.
- Contractor's all risk insurance.
- Property Insurance to cover subcontractor's owned or rented equipment.

All workers shall comply with the following Worker Code of Conduct:

- Shall not engage in any form of sexual harassment or prostitution.
- Shall not engage in any form of harassment in the workplace. Harassment includes, but is not limited to: epithets; slurs; negative stereotyping; threatening, intimidating, or hostile acts; or conduct that degrades or shows hostility or hatred toward an individual because of race, color, national origin, religion, gender, sexual orientation, marital status, age, or disability.
- Shall not have in their possession and/or consume any type of illegal drug, narcotics, or any kind of alcoholic beverage within the Site, including in any vehicle used for project activities.
- Shall not have in their possession and/or use any type of firearms, explosives, knives, or other weapons within the Site, including in any vehicle used for project activities, unless authorized in writing by the Project Engineer.
- Shall not affect or disturb in any way the lives of people living in Project-neighboring communities, businesses, and the direct area of influence.
- Shall not hunt and capture forest animals, any local animals, wild fruit and plants, or fish, and/or shall not gather animals or eggs.
- Shall not disturb archaeological remains.
- Shall not throw out waste on roads/streets, rivers, or any other non-designated area. Waste shall be thrown out only in designated waste bins/areas within the Project area.
- Shall respect and preserve the culture, knowledge, and practices of local Amerindian communities.

## WORK CAMPS

---

Only authorized Project workers will be allowed in the temporary work camps.

Any temporary work camp facilities shall optimize space use, minimize vegetation clearing, and avoid large-scale soil excavation. These camps will be set-up in areas where the construction team can possibly reuse this when the next team is passing the area

The camps and temporary facilities will be located at a 100-m minimum distance from any body of water and a 200-m minimum radius from any water spring.

The facilities will be planned so that they do not obstruct the passage of vehicles or workers, everyday activities of the community or transit of road users, or prevent a quick evacuation.

The rain and runoff water management shall implement an interconnected, perimeter system of covered channel-ditches, grease traps, and a tank or small pit for final sand removal, which will allow a controlled discharge from the facilities. All drainage to outside the facility will be controlled.

The water for human consumption will be supplied from sources that ensure service quality and potability; if no such sources are available, a treatment system will be implemented, which will adopt the potability recommendations for human consumption suggested by the World Health Organization (WHO).

Systems for efficient and rational water use will be implemented.

For managing waste water from the bathrooms, treatment systems will be installed, which will ensure that the final discharge complies with the quality requirements established by governmental regulatory requirements and IFC General EHS Guidelines.

In some of the temporary facilities, portable bathrooms will be used, which consist of the toilet, basin, and discharge storage tank. These facilities are supplied by specialized companies that remove the wastes routinely and transport them to government-authorized treatment and final disposal facilities. The companies hired for this service shall comply with the existing regulations.

At construction fronts, all workers will have access to a latrine at no more than 150 meters distance. Shaded eating and resting areas will also be provided

The solid wastes generated both at construction fronts and in the camp facilities will be separated according to their characteristics and temporarily stored in a suitable dedicated area and will be dealt with as per the Waste Management Procedure.

Any temporary onsite waste storage site will possess adequate access, ventilation, surfaces to avoid soil contamination, and control for preventing proliferation of insects, rodents, and carrion-

consuming birds

In case any minor maintenance is required in the camps, it will be conducted using spill prevention and control systems, and any oil and lubricant wastes will be stored temporarily in metal tanks, duly marked, and located on surfaces capable of containing a spill of the stored volume and avoiding soil pollution. These metal tanks will be disposed of by a Contractor authorized by the governmental authority.

Equipment and machinery wash will be carried out only at specific sites, which will be equipped with the necessary infrastructure for this purpose. These sites will consist of impermeable areas, with drainage taking water to a grease and sediments interceptor, avoiding leaks of contaminated water to the natural environment.

If power generators are used for electricity supply to the camps and temporary facilities, they will receive periodic preventive maintenance to ensure proper operation and control emissions from the combustion system. The generators will be located in covered, ventilated areas, situated on confined surfaces that prevent soil contamination in case of a fuel leak during refueling or maintenance activities, or due to a system fault. If necessary, a sound barrier will be installed around them.

The fixed equipment using fuel and lubrication systems will be installed on confined surfaces for preventing soil pollution in case of a potential fuel or lubricant leak.

Fuel storage for the electric generators and stationary equipment refueling will be located in covered, ventilated areas and situated on confined surfaces, for preventing soil pollution in case of a potential fuel leak.

The generator areas and those for generator fuel storage will possess all the necessary elements for ensuring the facility safety and fire prevention and fighting.

Common areas to which site staff have access, such as lockers, toilets, mess rooms, and wash rooms, will be maintained in clean and sanitary condition at all times.

All sites are kept free from litter and general refuse at all times, and sufficient general refuse collection points shall be provided for all works areas, and will be maintained and cleaned regularly.

Pest control shall be implemented for site offices and workshops as soon as evidence becomes apparent that such action is necessary. Only suitably qualified contractors shall undertake pest control.

light fittings shall be maintained in good condition and cleaned regularly. All floors in workshops or other works areas shall be kept clean and non-slip..

## **JOB CREATION AND ACQUISITION OF LOCAL GOODS/SERVICES**

The Project will give priority to hiring local qualified and non-qualified labor belonging to the project's area of influence, provided they fulfill the qualifications necessary for the type of job offered.

The local communities will be informed about the required profiles for qualified and non-qualified labor, the project schedule, number of vacancies for each activity, contracting time, salaries, and form of payment.

Hiring requirements will be disclosed by the Project, explaining the qualifications and documents to be presented, and certifying that the persons to be contracted live within the local communities.

In spreading the job offer, the transitory nature of the work will be emphasized, so that the traditional local subsistence sources (agriculture and livestock activities) are not affected by an eventual labor displacement.

Local communities will be informed about the demand for goods and services necessary for the Project construction and the corresponding requirements for their purchasing and hiring.

Goods and services acquisition and hiring will be carried out by means of transparent, competitive and fair processes as perceived by community organizations and the general public.

The type of goods or service, usage time, and requirements to be fulfilled, will be established. All of this information will be public and available to the communities.

The goods and services offered within the area of influence shall comply with the following requirements: appropriate quality, required availability and quantity, and competitive prices.

If the service or resource is not available at a competitive price or skill level at the local level, the next option will be the regional level, and the third option will be the national level. This is the case for safety clothes and gear for construction workers, such as gloves, safety boots, and respirators, among others.

Concerning basic needs, they will be addressed with supplies from stores and shops in the districts and cities close to the Project site, if the supplies are available in sufficient quantity, at competitive prices and quality, and without interfering with local prices and supplies.

## SECURITY MANAGEMENT

---

Those responsible for security arrangements:

- Shall be guided by the principles of proportionality, good international practices in terms of basic human rights international conventions, hiring, rules of conduct, training, equipping and monitoring of such personnel, and applicable law;
- Make reasonable inquiries to check that those providing security are not implicated in past abuses, crimes, irregular behavior, etc.;
- Provide training to security personnel on the use of force (and where applicable, firearms) and appropriate conduct toward workers and the local community, and require them to act within the applicable law;
- Not sanction any use of force except when used for preventive and defensive purposes in proportion to the nature and extent of the threat;
- Use the complaints lodged in the grievance mechanism by the local community to assist in tracking, assessing, and managing the performance of security personnel.

The Project contractor will actively discourage the movement of any non-Project persons along the cleared area.

The Project contractor will install physical barriers to prevent unauthorized access to the cleared area for selecting road alignment.

The contractor will provide security training to all employees. All employees will be trained in, and will be familiar with, the contractor's security procedures. At a minimum, training will cover overall security objectives, individual employee security responsibilities, specific security procedures; and the organization's security structure. Management would be responsible for establishing and communicating the security goals.

Construction supervisors will be responsible for being knowledgeable of the security issues and concerns of their area, and employees. They will also be responsible for providing information on system operations including daily work processes, activities, and identifying potential security vulnerabilities. The construction supervisors select, prioritize, develop, and implement strategies and procedures to meet established security goals, measure and monitor the effectiveness of the security strategies and procedures and to review and when necessary, adjust the strategies and procedures. If deficiencies or other vulnerabilities are discovered in the security process, appropriate corrective action or adjustments will be made.

The Contractor will provide a work environment that is reasonably free of hazards and threats of violence which may cause damage to property or harm to people. Employees will be responsible for adhering and conforming to all security-related work activities and procedures. In addition, employees would be encouraged to provide feedback and suggestions on ways to improve the organization's security program.

All employees have a responsibility to themselves and to the Contractor, to observe and report any suspicious or unusual activity that threatens safety or security. Employees would be trained

to use common sense and good judgment when assessing threat potential of any suspicious activity. Employees will report any observed suspicious activity to their immediate supervisor. All employees will understand and adhere to the following corporate suspicious activity reporting procedures. All employees will follow these procedures in the event any unusual or suspicious activity that poses a threat to the safety of our employees and the security of our equipment, facilities, or hazardous materials cargo, is observed.

Suspicious activity is defined to include (but not be limited to) any of the following:

1. Unidentified person(s) attempting to gain access to property, equipment, or facilities;
2. Unidentified person(s) in any area of the company, office, yard, or parking lot;
3. An employee, unescorted vendor, or supplier visiting a part of the facility for no known reason;
4. Any unescorted or unaccompanied visitor anywhere in the building or wandering around the yard or parking lot;
5. Any person (employee or otherwise) who appears to be hiding something or is acting nervous, anxious, or secretive;
6. Any employee or visitor making unusual or repeated requests for sensitive or important company documents or information;
7. Any person asking an employee to make any unauthorized movement (pick-up and delivery) for cash;
8. Any person or group loitering outside a company facility or premises;
9. Any person claiming to be a representative of a utility (gas, water, electric) but cannot produce valid company identification;
10. Any person carrying a weapon such as a gun or knife;
11. After hours, any vehicle driving by a company facility with the lights off;
12. Any occupied vehicle parked outside a company facility - especially if the vehicle has been sitting for a long period or after normal work hours.
13. An unfamiliar vehicle that appears to be abandoned near a company building or parking lot.

Supervisors will be responsible to communicate all relevant corporate security-related information, news facts, and trends to their employees in a timely and accurate manner.

The Contractor will establish a partnership and professional working relationship with local law enforcement officials and other public safety and security agencies. These partnerships may include the sharing of the company's operation and work progress materials stored on site or transported. Local law enforcement officials and other public safety and security agencies may be periodically invited on-site to discuss and evaluate potential security risks, vulnerabilities, and to assist in the development or enhancement of the security program.

All suspicious activities or apparent criminal acts affecting the safety or security of the company's interests will be reported immediately to the proper law enforcement agencies and appropriate company official. In addition, a detailed written report will be made of any security-related incident.

A complete listing of emergency telephone numbers will be provided to all construction supervisors. The list will include the numbers for local police.

The company will provide adequate security measures to ensure the safety of our employees, equipment, facilities and the general public.

All perimeter fences, where deemed necessary, will be subject to a schedule of regular inspection of the fence and associated gate(s). Broken fences, walls, and other barriers will be repaired immediately. Construction Supervisors will be responsible for implementing and enforcing the regular schedule of inspection which includes, but is not limited to the following:

- A daily routine of securing all gates and related locks.
- A periodic perimeter fencing inspection.
- Monitoring and sealing entrances which go under the perimeter such as culverts

Perimeter fences will meet the following specifications:

- Fencing will be at least six (6) feet high, securely anchored, and topped with a barbed wire section angled outward at a 45-degree angle.
- Chain-link fence shall be at least nine-gauge or heavier, with openings no larger than four inches.
- All fencing will be installed in such a way so that no gaps are left between the fencing and areas where it butts up against a building and adequate clearing on both sides of the barrier is maintained.

Any unusual or suspicious damage to fences or gates will be reported to the construction supervisor immediately. Each construction site will be responsible for ensuring areas adjacent to both sides (inside and outside) of the fence are properly maintained and remain completely clear of trash, debris, and all plant life (weeds, shrubs, and bushes). Fence lines will be kept free of debris or other objects (such as trees, pallets, or skids) that could be used to allow entry over the fence. Storage of any ladders or long objects will be kept away from fencing/barrier to prevent scaling a fence or entering a building.

Construction areas, equipment storage area and parking lots will be well lit and exterior security lighting will be directed downward and away from buildings to prevent glare and to ensure the grounds are visible. Exterior security lighting will be inspected at a rate of not less than once per month.

Access to construction areas, equipment storage area and parking lots will be confined to designated gates or entrance points at all times. After regular hours, the entrance will be locked and be monitored by 24-hour personnel.

Vendors and suppliers, (needing to make deliveries or pickups), other than company personnel, will be directed to the appropriate pick up/delivery area. Once the pick up or delivery has been completed, the vendor/supplier shall depart from company grounds.

All general visitors will be required to check-in/register with the on-duty site manager upon arriving. Under no circumstances will a visitor to the company be allowed access without first

registering. A written log will be maintained for all general visitors to the site and will include the following:

- The name of the visitor and company he or she represents;
- The date and time of arrival;
- Name of person in which he/she is visiting; and
- The date and time of departure.

## AIR QUALITY

---

Effective water sprays or covers shall be used during the delivery and handling of materials to prevent dispersion of transported materials, especially during dry and windy weather.

Any vehicle with an open load-carrying area used for transporting potentially dust-producing material shall have properly fitting side and tail boards. Materials having the potential to produce dust and traveling near residential areas, shall not be loaded to a level higher than the side and tail boards and shall be covered with a clean tarpaulin in good condition. The tarpaulin shall be properly secured and extend at least 300 mm over the edges of the side and tail boards.

Stockpiles of materials shall be sited in sheltered areas away from sensitive environmental areas. Stockpiles of material or debris shall be dampened during storage and prior to their movement, except where this is contrary to the road material construction specifications, and which in this case, shall be stored in a manner to prevent dispersion of materials due to winds.

Slower speed limits will be enforced on unpaved roads under dry, windy conditions.

Aggregate facilities will be located away from human settlements (minimum 500 m), and operation of such facilities will comply with government regulatory requirements and IFC General EHS Guideline.

In periods of high wind, dust-generating operations shall not be permitted within 200 m of residential areas in the prevailing direction of the wind.

All construction vehicles and machinery shall be kept in good working order and engines turned off when not in use. Appropriate measures shall be taken to limit exhaust emission from construction vehicles and machinery and ensure efficient fuel use. Routine monitoring of construction vehicles and machinery shall be performed.

In residential areas or other sensitive areas (e.g., schools, health clinics/hospitals, etc.), advance warning shall be given to potentially affected persons, so that some measures can be taken by them before commencement of Project works.

Application of good construction and activity management procedures in areas of direct disturbance should be used to mitigate air quality impacts. Fugitive dust levels may be controlled by periodic wetting of loose dirt, un-vegetated areas, and stripped road surfaces.

Application of the dust and particulate control measures will consider local climate variables, such as wind direction and speed and temperature. Mixing equipment should be sealed properly, and vibrating machines should be equipped with dust-removing devices.

Protective masks should be available to vehicle operators and construction workers to protect them from potential respiratory effects of dust.

Areas within the site where there is regular movement of vehicles shall have a suitable surface and be kept clear of loose surface material.

All motorized vehicles within the Site, excluding those on public roads, shall be restricted to a suitable speeds to avoid dust impacts to sensitive receptors.. Haulage and delivery vehicles shall be confined to designated roadways inside the site.

## **NOISE**

---

Construction equipment shall be operated to minimize noise impacts, wherever possible.

In accordance with good practice all equipment utilized will be maintained in good condition with all sound suppression systems or components (e.g., muffler systems) in a good state of repair in accordance with the manufacturer's specifications.

Plant and equipment should conform to international standards on noise and vibration emissions. Examples of quiet noise equipment include: Bulldozer: 110 dB(A) max, Breaker (hand): 110 dB(A) max, Dump Truck: 110 dB(A) max, Excavator: 105 dB(A) max, Lorry: 105 dB(A) max, Concrete Pumps: 105 dB(A) max, Compressors: 100 dB(A) max, Generators: 100 dB(A) max, Water Pumps: 88 dB(A) max, Poker Vibrator: 110 dB(A) max.

Operation of all mechanical equipment and construction processes on and off the Project site shall not cause any unnecessary or excessive noise to receptors, and will comply with the Project established noise limits (Guyana and IFC General EHS Guideline).

All plant and silencing equipment will be maintained in good condition so as to minimize noise emission.

When operating close to sensitive areas such as residential areas, schools, or health facilities, the working hours should be limited to daytime hours.

Plant and equipment operations shall include proposed measures for limiting noise to receptors, including but not limited to the relocation of a noise-emitting plant, and the use of silencers, mufflers, acoustic sheds or shields, or acoustic sheds or screens, and shall be selected based on the best reasonable practice.

Only well-maintained plants shall be operated on site, and plants shall be serviced regularly during the construction program.

Machines and plants that may be in intermittent use shall be shut down between work periods or shall be throttled down to a minimum.

Equipment known to emit noise strongly in one direction, shall, where possible, be oriented so that the noise is directed away from nearby sensitive noise receptors. Mobile equipment shall be sited as far away from sensitive noise receptors as possible.

Material stockpiles and other structures shall be utilized, where practicable, to screen sensitive noise receptors from onsite construction activity.

Businesses and nearby sensitive noise receptors shall be informed of the construction activities, so that they can be aware of and therefore be prepared for, periods of high noise levels.

## **AMERINDIAN COMMUNITIES**

---

All those working on and visiting the Site will respect and preserve the culture, knowledge, and practices of local communities. Any work planned within Amerindian lands shall require proper protocols are followed, including review with (and possible approval of) village leadership and Ministry of Amerindian Affairs (MOAA).

The Company will implement actions to promote respects for rights of Amerindian people (indigenous peoples).

The Company will actively recruit employees from indigenous communities around the construction area.

The Contractor will make available to the nearby Amerindian communities, use of forest resources cut for the Project, which are within the boundary of said communities, in so far as that use does not impact the Project operations and approved by Guyana Forestry Commission(GFC) and MOAA.

The contractor will assign a local project liaison representative to meet regularly with Amerindian community representatives and other community members to provide feed-back on progress.

The Owner (in close coordination with the Contractor) will dialogue with the local communities to understand their expectations and create strategies to generate local employment and will consult and engage with artisanal miners who use the access road.

## **ARCHEOLOGICAL**

---

In case of discovery of archaeological artifacts or items that could be considered archaeological artifacts, workers shall halt work activities and, without removing the artifacts, shall inform their field supervisor and the Project EHS Manager. Contractor will quickly inform Owner of any potential archeological finds.

If unintentionally disturbed, then any relics or items of archaeological importance encountered during the operations will be set aside from the operations and will be preserved.

The Ministry of Culture and/or the Walter Roth museum will be consulted on the most appropriate mechanism for management of these resources.

## COMMUNICATION

---

The Owner will assign a local project liaison representative to coordinate with Contractor and support regular meetings with Amerindian and other community representatives and other community members to provide and receive feed-back on progress of the activities.

The Contractor will work closely with Owner in dialogue with the local communities to recognize expectations and create strategies to generate local employment and will consult and engage with artisanal miners who use the access road.

The Contractor will provide details to Owner, related to environmental incidents and the responses taken to those incidents to the public in the project area, as well as any communications, grievances, or inquiries with local communities.

Any interactions with the affected local communities should be reported to the EHS Manager, Contractor Project Manager, and Owner.

The Contractor will work closely with Owner to:

- Engage with the local community through ongoing disclosure of project-related information and consultation on matters that directly affect them.
- Consult with affected local communities in an inclusive, structured, and culturally appropriate manner to ensure their free, prior, and informed consultation and facilitate their informed participation.
- Ensure that engagement is free of external manipulation, interference, coercion, or intimidation, and is conducted on the basis of timely, relevant, understandable, and accessible information.
- Provide periodic reports that describe progress in implementing any action plans on issues that involve ongoing risk to or impacts on affected local communities, and on issues that the consultation process or grievance mechanism has identified as of concern to those local communities.
- Establish a grievance mechanism to receive and facilitate resolution of local community concerns and grievances about the environmental and social performance of the Project. The process will address concerns promptly, using an understandable and transparent process that is culturally appropriate and readily accessible to all segments of the local community, and at no cost and without retribution.

Contractor will not engage communities without prior coordination with and approval of Owner.