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M- 1096/MP/000 Demerara River, Left Bank

PROJECT SUMMARY

Sand Quarry Operation

1. SUMMARY

This quarry operational development plan is prepared for a white sand mining project situate on the left bank Hubudeba Creek, left bank Demerara River.

This plan contains a summary of the activities scheduled for 2024-2029 pursuant to the requirements of a Mining Permit for sand mining.

The planned production level is ten thousand tons per month of silica sand, for the local and overseas markets. A permission to occupy State land for sand mining purposes was granted by the Guyana Lands and Surveys Commission for a five years period. Royalty on production of sand is payable to the Guyana Geology and Mines omission "GGMC") at G$15 per ton. A renewable environmental bond of G$100,000 is required to be lodged with the GGMC. This amount has been deposited with the GGMC.

A further requirement is the submission of a quarry operational plan which will guide the activities of the project.

This operational plan is prepared with a strategic focus on mining operations beyond the next five years.

2. LOCATION AND POINT OF ACCESS

2.1 Location

The Tract of State land is situated about half mile above a non-navigable tributary of the Hubudeba Creek, left bank Demerara River; and about 35 miles from Georgetown. (See topographic stock sheet 28NW).

2.2 Access

The mining site can be accessed via the Sand Hills/ Mocoura Road from the Demerara River or the Essequibo River. Since it is closer to the Demerara River, this will be the main access point for shipment to Georgetown and other locations along the Demerara coast. The site is accessible during all of the seasons throughout the year due to a well established all weather road.

The mining site lies approximately 45 miles by road from Georgetown via the East Bank/Timehri Main Road. It will take approximately one and half hours to reach the site using an off road vehicle, then a boat to the cross from the right bank to the left bank of the River. Quarry material will be barged from the site to a private wharf in Grater Georgetown for the domestic market.

2.3 Physiography

The mining site is located within the hilly, undulating, and rolling sandy plains of the country, which lies south of the low coastal plain. There is a small community along the bank of the River at "Sand Hills" which is mainly involved in subsistence farming and wood cutting as their main economic activities.

The mining property lies approximately 2 miles inland and about 100 feet above the mean high water mark or the normal flood plain of the Demerara River. Fresh water for the community is obtained from the Demerara River at high tides and from its tributaries such as the Donoon Creek which lies north of the community.

2.4 Climate

The climate in the area is generally similar to rest of Guyana which has a tropical climate with almost a balance period of rain fall and dry seasons. The average daily temperatures is about 39 degrees Celsius with an average annual rainfall of 2230 mm. Seasonal variations in temperature are negligible, particularly along the coastal zones. Although the temperature never gets dangerously high, the combination of heat and humidity can at time prove uncomfortable for persons working in the fields. The entire area is under the influence of the northeast trade winds.

The general climatic characteristics of the Mining Zone are as follows:

- Long Rainy season – from mid April to mid July. This period receives about 40-60% of the total annual precipitation. It is fairly well predictable.
- Long dry – From mid-August to late November.
- Short Rainy season – From late November to late January with less than 20% of the total rainfall. This period is most unpredictable in terms of the onset, duration and cessation of rainfall.
- Short Dry – From late January to mid- March.

Mean annual temperature is fairly constant throughout the year with no more than 100C in seasonal variations. Diurnal – fluctuations in the temperature are more pronounced and may vary by as much as 30^0 C to 40^0C from the maximum daily to the minimum daily temperature.

Highest temperatures are recorded during the dry months of August to November and the coolest months are January to March. The mean annual sunshine hours per day is about 6.7 hours with a mean monthly maximum in September (8.2 hours) and a mean minimum in May (5.8 hours).

The climate therefore is conductive, suitable and convenient production for most of the year.

3. GEOLOGY AND MINERALIZATION

3.1 Geology

The area is underlain by Precambrian rocks at the great depths; and over which are the Corpina Clays. The upper layers form the White Sand Series.

The White Sands of Guyana represent the uppermost member in the sequence of unconsolidated sands known as the White Sand Series on Berbice Formation. Over 5,000 square miles of Guyana are covered with deposits of loose white and brown sands of variable thickness. The White Sand covers account for almost a quarter of this area. The upper sands are underlain to downward succession by:

- The Intermediate Clays
- Lower sands
- Alternating sand and clay.

3.2 Mineralization

The region is known principally for its silica sand and the existence of residual deposits of bauxites and some lateritic clay.

3.3 Reserves

Cross section bore holes at an interval of 200 meters (transections) was executed over the site to assess portable reserves. This area has an elevation of average 100 feet above the mean high water mark of the river level. Taking into consideration a depth of approximately 10 feet from the water table for the quarry floor: a volume of 20,018,500 yd3 was estimated.

3.4 Product Specification

The Quarry will produce silica sand of size passing a 3 millimeter mesh for export to the Caribbean and North America markets. Quarry sand in excess of 3 millimeters in size will be stockpiled and sold to specialized sandblasting markets in Guyana and oversees.

4. MINE OPERATIONS

4.1 Stripping and Clearing

Land clearing and stripping of the top soil and overburden will be executed by using a D6 Dozer. The predominant vegetation is small trees of a height of 3 to 5 meters and small shrubs. The felled trees will be placed at the perimeter of each panel to be mined and the loggers in the community will be given the opportunity to use it for shore wood and coal. The overburden ranges from 1.6 meter to 0.85 meter depth; whereas the topsoil approximates at 0.1 meter in thickness. The stripped overburden and stripped top soil will be stored separately and used in the land reclamation phase.

4.2 Excavation

Mining of the sand will be executed using a H972 Front End Loader, which will excavate and then feeds the material into a hopper for screening by a vibration set of screens. The scalped material that is plus 3mm will be stockpiled separately. The minus 3mm fraction will be trucked to the landing and fed onto a multi-stage conveyor, then directly via a Shute onto the consigned barges for shipping.

4.3 Loading and Hauling

Trucks will be loaded by the Front End Loader and the sand will be transported to the stack-pile at the landing.

The quarry face will be maintained at the natural angle of repose for sand material to facilitate the easy traverse of the trucks. The height of the face will be kept below 30 feet for the duration of the project. 30 feet benching will be designed and implemented.

4.4 Washing and Screening

The site has a generous reserve of high quality raw silica sand with a high content of SiO_2, required grain size and low content of impurities. As the Quarry progresses, the quality of the sand will be monitored and analysis to ensure that the best grades and delivered to the customers. The processing of silica sand will be done in four stages including washing, sieving, separating and drying to produce industrial white silica sand having an extraordinary high purity, with SiO_2,>99.5 wt%.

The raw-material will naturally be moist and will contain tramp material such as root remnants, small stone agglomerates, etc. This tramp material requires further processing. The sand will be screened at

2mm especially for golf courses and other sporting fields and for the above 5000 PSI ready mix concrete industry.

The angel of the screen decks is 25° and 15°.

At the initial stages, a wet screening will be implemented. Water will be collected in a sump and left to settles and will be recycled. A 100 meter settling pond will designed to increase the volume of water available and aid improved water management. No water will be released directly into the Demerara River. A series of tailings filtering ponds will be used to purify the water.

4.5 Stockpiles

There will be three sand stock piles areas :

1) The upper stockpile area situate on within the mining site with have a capacity of 5,000 ton of plus 3mm silica sand;
2) The landing stockpile situated at the waterfront with a capacity of 1,000 tons of minus 3mm silica sand.
3) There will be a dredged material (coarse sand and gravel) stock piled.

4.6 Export of Products

The finial product of minus 3mm sand will be dispatched to local and overseas markets. All other by products falling outside of this specification will be stockpiled for the special sandblasting market. The site will be operated for 40 hours per week and its estimated output is 20,000 tons per month. Approximately 14,000 tons of Quarry products will be shipped to export markets in the Caribbean and North America and the balance to the local contractors. The market segments include: Construction of Roads and buildings; Beach sand replacement; and landscaping.

4.7 Water Management

Clean water will be harvested from rainwater catchment and stored in above ground water tanks which will be constructed on the lower elevation. This water will also be purified for used for cooking and drinking on the site.

The natural drainage of the area will be utilized to minimize any potential soil erosion. Drainage of the tailings ponds will be achieved by use of a combination of earth filters and wooden pipes. – the major potential negative impact of poor drainage is soil erosion. Drains will be excavated at key depression points on the northern and southern boundaries of the site.

The quarry floor will be kept at least 3m above the mean high water level of the river to prevent flooding.

Surface water will be continually directed away from the active pit areas to avoid in-pit flooding problems.

Monitoring of the pit drainability will be particularly important in areas where the soil is of low permeability. Diversion drains will be established to divert water away from the mine face and into the filtering system which will assist with prevents erosion of the mine floor and pit wall.

4.8 Plant and Equipment

Equipment List

Quantity	Description
One (1)	Draglines
One (1) One (1) One (1)	CAT 966 Front – end loaders CAT 980 Loader Shantui Loader
One (1) One (1)	CAT D6 Dozer CAT D8 Dozer
One (1) One (1)	CAT 220 Excavator Linkbelt 225 Excavator
One (1)	Cummings Generating set 130KVA
One (1)	DORMAN generating set 250 KVA (400v, 50hz)
One (1)	HBZ AC synchronous generator 120/240v, 6hp
One (1)	Lincoln Electric portable welding set 300A
One (1)	3-jaw chuck bench lathe
One (1)	Complete wash plant with hydro-cyclone separator
Two (2) One (1)	Multi – stage conveyors system with hoppers (Kafka Conveyors) 250 feet lateral conveyor with hopper
One (1)	Combined unit: Ro-Tap vibrator and set Fishers sieves
One (1)	Pickup trucks
One (1)	15 hp outboard engine
One (1)	18 ft Aluminum boat

Production Equipment Operating Parameters

Equipment	CAT Dozer	Fronted Loader
Fleet size	02	05
Availability (%)	80.0	80.0
Operating Efficiency (%)	85.0	90.0
Utilization (%)	00.0	00.0
Operating System/Week	1*12*5	1*12*7
Operating Days	300	300
Operating Hours	4,800	1,200

4.9 Manpower

Staffing of the Company comprises:

- One general manager
- One Fields Manager
- One accountant

- One foreman – mechanic
- Four utility operators
- One welder/mechanic/fabricator
- Six Truck Drivers
- Three laborers
- One cook

4.10 Fuel Management

This project will aim to maintain a fleet comprising of mainly diesel equipment inorrder to avaid multiple types of fuel storage. A significant quantities of fuel will be required for the operation of all of the equipment and to fuel the generators. A small quantity of gasoline will be stored to supply the outboard boat engine, pressure washer and chain saw. Monthly consumption is budgeted at 6,000 gallons of diesel and 200 gallons of gas along with 500 gallons of lubricants.

A 10,000 gallons fuel tank will be installed for the storage of diesel fuel. A separate 500 gallons portable gas tank will be kept on site.

- **Storage**
  Diesel fuel will be required for all mobile equipment and will be stored in a metal cylindrical tank with a capacity to hold approximately 10,000 gallons.
  The fuel tank will be erected on a concrete mat foundation and protected by a surrounding one (1) meter high curb wall to retain any spillage. This is dispensed by a flex hose connected to a valve. Clean – up of this facility is normally done by a collection sump for waste fuel.
- **Handling**
  The storekeeper will be responsible for the issuing of fuel to equipment and the requisite records and inventory are kept and reported on a weekly basis. Fuel will be dispensed by an automatic meter which will facilitate accountability.
- **Usage**
  The list of equipment contains mainly Diesel equipment and the average usage of each equipment per hour of uses will be obtained from the retailer and actual usage will be reported.

The occupation health and safety guidelines regarding management of fuel spills will be fully implemented to avid pollution of the environment.

4.11 Reclamation Closure

The principal of 'mining for closure' will be observed continuously during the operation. That is the final mine layout and identified end-use after mining guides all activities during operation. Closure is expected to result in a safe, stable and sustainable environment.

Progressive reclamation will be implemented with the aim of economic alternative use of the site:-

- One meter of top soil material will be stockpiled for replacement.
- For every 10 tons of material excavated, one ton of overburden material to be stockpiled.
- The quarry floor is maintained at a minimum height of 3m form the water table.

5. OCCUPATIONAL HEALTH AND SAFETY

- **Introduction**

  An occupational Health, Security and Safety Plan (OHSSP) will be implemented throughout the operations and also incorporates closure of the quarry development.

  The purpose of the OHSSP is to:-

  Protect and reclaim land and water courses affected by mining activities.

  Manage the excavation of sand to maximize extraction and minimize environmental disturbance taking into account sound engineering practice and economic conditions; and

  Protect employees and other persons from undue health and safety risks arising from mining activities.

- **Regulations**

  The Quarry development and safety will be guided by :

  Section 20 of the Mining Act No. 20 of 1989;

  The Mining Regulations Regulation 100 through 125 (Inclusive);

  Further guidance is obtained from the following:-

- Mining Regulations for occupational Health and Safety Regulations (2002); and
- Code of practice – Sand and Loam Mining (GGMC)

- **Schedule Hours for Work and Plan of Operations Implementation**

The OHSSP is an integral part of the quarry development and instated throughout the quarry project life cycle. Operations will require an eight (8) hour working shift from 8am to 5pm Monday to Saturday. However work will be schedule for overtime at nights and holidays as required for meeting production and shipping schedules.

- **Occupational Health Management**

The following is an extract for the Occupational Safety and Health Act (1997) and it lays down the 'general Duties of a worker'. Any 'Worker' who fails to comply with these duties is in breach of the legal obligations placed upon them will be dealt with according to the Law.

- **Monitoring**

A Medex or Registered Nurse visits will visit the project site once per month to conduct health checks on the staff in addition to assessing the implementation of arrangements of good housekeeping, hygiene and sanitation. This medical personnel comes from the nearby medical center at Hauraruni at the Company's expense.

The water quality will be monitored on a monthly basis. Water for drinking/cooking purposes in addition to the river water, upstream and downstream of the quarry site, will be regularly monitored. Monitoring will include on site testing as well as water quality sampling and testing at the government lab.

- **Security, Safety and Environmental Management**
- **Identification of some risks**

An environmental crisis arises where there is potential or actual contamination of the environment that. This requires immediate action. Some examples of events that would require the implementation of an emergency response procedure at the project site includes:

- Major fire at Plant
- Sinking of barge with cargo
- Excavators roll over and falls into pit
- A fuel tanker rollover involving the spillage of large quantities of fuel within waterway
- Bushfire;
- Fuel spill from oil tanker whilst off – loading
- The failure of pipeline or pump resulting in spillage of contaminated material into the surrounding nature.

- <u>Training</u>
  All workers will be provided general training in safety, basic security, health and industrial hygiene. General training will include:

- Workplace safety
- Wildlife preservation
- Standard Operating Procedure for Mines
- Communication on using 2 ways radios,
- Telephone ethics
- Proper use and maintenance of personal protective equipment
- Housekeeping practices such as: waste disposal and storage of food
- General First Aid
- Fire suppression
- Emergency preparedness and procedures
- Natural Hazards
- Interaction with wildfire and wildlife protection
- Environmental protection
- Regulatory (legal) requirements
- Basic maintenance and servicing of plant and equipment

The quarry site is situated in an area which has a moderate amount of wild life such as small jaguar, deer, monkeys, wild hogs and small rodents such as agouti. Staff will be trained by wildlife protection to avoid harm to wildlife at all cost. Management of the site will include control and disposal of extra food and garbage wastes to ensure that they are not accessible to curious animals. Maximum haul traffic speeds will be established by the HSSE Supervisors to reduce the potential of impacting wildlife on the roadway.

Strict prohibition will be placed on trapping, harming or killing of wildlife at the quarry site.

- **OSH Practice**

The site will implement and demonstrate good waste management practices at all times. There will be proper facilities for disposal of solid waste and human waste, and other hydrocarbon products. Adequate and proper storage of

drinking water for consumption at the site will be of the highest priority. The operation plan will include instruction for maintenance and re-fueling of plant and machinery; handling of spillages; protection from dust and noise; basic training in fire prevention and firefighting; basic training in first aid techniques. Workers will be provided with appropriate personal protective equipment's such as helmets, safety boots, ear mufflers, goggles, air respirators as needed.

- **Safety**

Fire points with fire extinguishers will be mounted/installed in conspicuous areas around the plant. Muster points will be established and two pickup truck as well as an outboard engine with boat will be on hand for emergencies response.

Waste oil will be collected and stored in 45- or 50- gallon barrels and sold to chainsaw operators from the 'Sand Hills' community. No waste is discarded directly into the environment.

6. ENVIRONMENT MANAGEMENT

By its nature, the removal of sand and loam modifies the local topography. However, due to the natural undulation nature of the location, the scale of this project will not have a wide ranging impacts on environmental. Using the well-defined guidelines for environmental management, the site manger and supervisors of the operations will ensure that the necessary mitigating measures are implemented in compliance with the mining laws and environmental protection Act. The site will be divided into sections which will be mined and restored as soon as the section is exhausted.

Removal of sand has the potential to impact the Air quality. Removal of sand may also affect groundwater reservoirs if mining is done too close to the water table. To mitigate this potential hazard, a buffer from the boundaries of the mines will be set aside. Machine operation during this process would have minimal negative impacts on air quality. The site lies over one kilometer from the ladings and therefore the noise pollution will not affect the residents. Employees will be equipped with PPE for dust and noise pollution. Transportation of the material to clients / customers during the shipping activities would be protected by coverings. Not all of the negative impacts given can be totally eliminated but with good management, it will be reduced to a negligible amount within acceptable environmental limits.

Proper waste management procedures can control oil pollution and prevent pollution from domestic wastes.

Training of the employees in the use of protective equipment, routine equipment maintenance, will contributes towards good environmental management.

- Environmental Impacts

This plan identifies and recognizes the main forms of adverse environmental impact activities and summarizes the types of actions required to avoid or minimize them.

- **Air Impacts**

Sand mining and processing facilities have two types of air emissions. The first is from dust that may be emitted during the mining and handling of sand. The second is from various pollutants emitted from equipment used to mine, handle, and/or process the sand.

- **Dust Control**

Dust is potentially an environment and health hazard and must be controlled in order to minimize impacts to workers and adjacent communities. Effective dust control activities focuses on the sources of the dust and wetting covering of stockpiles. Stockpiles are locates away from the property boundaries, water courses and sensitive areas such as dwelling.

- **Noise Control and Reduction**

Noise is generated in most production and haulage activities. It is the major pollutant in the sand mining environment. Most noises sources are identified and managed. There are no haulage trucks however equipment such as excavators is fitted with mufflers to keep decibel level below 85. Maintenance schedules are set and kept for all plant and mobile equipment.

For this sand quarry operational equipment are assigned to:

- Overburden Excavation and Removal;
- Backfilling;
- Pumping;
- Washing;
- Stockpiles;
- Conveyors;
- Screening;
- Loading/Uploading;
- Mobile Equipment;
- Generators.

7. CONTINGENCY AND EMERGENCY RESPONSE

- **General**

Emergency response procedures deal with events either not foreseen nor expected that are likely but improbable. It is necessary therefore to plan for worst case scenarios or adopt general procedures, as normally anything that can be covered by a specific plan is not an emergency. It is important to recognize that any crisis may have serious impacts well beyond the individual operation immediately the general public.

The emergency response will be prioritized by the following actions:

- Protection of human health and safety;
- Protect and minimize the effect to the health and safety of animals;
- Contain to spread the material;
- Neutralized and render safe any noxious or hazardous materials; and
- Commence cleanup activities site remediation.

- **Outline of ERP**

The Emergency Response (ERP) is designed to provide protection to the social and natural environments in close proximity to the operations. This plan will be immediately implemented should there be any major accidents or spill of hazardous material, oil or an excessive deposition of sand into the Demerara River. To

facilitate the ERP, training will be given to the staff in terms of public relations and community assistance. Notification to the related agencies such as the Guyana Police Force, Geology and Mines Commission, the Ministry of Social Protection – Department of Labour, Occupational Safety and Health, the Guyana Forestry Commission and Environmental Protection Agency are integral to the plan of response.

This Emergency Response Plan (ERP) describes the general types of emergency and actions to be followed, should an emergency occur during the mobilization and operational phase of the project.

The ERP includes:

- Emergency Contract Details;
- Emergency Procedures ;
- Description of an Emergency;
- Authority of Control;
- Scenario Description and Response;
- Materials Inventory;
- Incident Reporting.

The above information is provided to employees and placed at strategic locations within the project site. Such locations will include the mine (quarry), power generation plant, site office, mechanical workshop, storage bond and wharf facility.

It is critical that the staffs are adequately and well trained about safety and detailed emergency procedure these include frequent emergency drills etc. The operator of the mines has assigned a foreman to perform the functions of Health Safety and Environment Officer who would be responsible for coordination and execution of actions as they relate to health, safety and environment.

- **Actions following an accident**

The following measurers will be taken immediately:-

- The injured person will be taken to a safe place for first-aid treatment;
- Elimination of any additional/further danger arising from the event;
- No person, other than the rescuers would be allowed to enter the area where there has been an accident, except when it has been made safe;
- Rescuers would be cautious in their own individual safety so as to not endanger themselves;
- Injuries, however small will be reported to the quarry manager/supervisor in charge of first-aid;
- Arrangements will be made for transporting injured persons to the nearest health post or medical facility.

- **Emergency Contact Details**

Name	Particulars	Contact
Guyana Police Force	Timehri Police Station Madiwini Police Outpost	261-2222 261-5444
Guyana Fire Service	Timehri	261-2291;261-2211; 261-2255
Guyana Defense Fore	Timehri	261-2223;261-2378-9 261-4507-9
Guyana Forestry Commission	Soesdyke Forest Station	261-5310;261-5044
Guyana Geology and Mines Commission	Manager, Mines Mines Division	223-5228 225-6691
Owner Owner's Representative	Hakeem Mohamed 36 Robb Street, Georgetown	592 623 8285 Email: hakeemmohamed@yahoo.com

- **Description of an Emergency**

An emergency is a situation in which injury to a person (s) and/or damage to the environment are involved requiring emergency response (service/attendance).

- **Authority of Control**

The Quarry Manager and the Operations Supervisor have the authority to take control of any incident. These persons have the authority to take the decision to lose down all or any part of the operations following an incident. They will be supported by the senior staff of the operations.

- **Incident Reporting**

After every incident/accident a report will be prepared and submitted to the GGMC, Labour and the EPA. The Quarry Manager will be have direct responsibility for the preparation of such a report. The following is a format which would be used.

- **Minor Accidents**

In the event of a minor accident, the Quarry Manager will be informed and who then take the responsibility for on-site treatment utilizing First Aid facilities. An entry will be done into the Accident and Emergency Record book.

- **Scenario: Accident**

1) Inform Principal (Owner/Operator) and/or Quarry Manager.
2) In the case of injury, first Aid treatment to be applied.
3) Assess type of injury, i.e. broken leg, conscious or unconscious.
4) Arrange transportation to Diamond Hospital via river and road transport
5) Arrange transportation to Georgetown Hospital via road transport
6) Make entry into the Accident and Emergency Record book.

- **Scenario: Fire**

  Firefighting equipment's such as fire extinguishers and sand buckets are located at strategic points within the various work area with instructions on their usage. These strategic points are clearly marked, visible and all employees have knowledge of their position. In the event of a fire, employees will initiate the following procedure which that they would be familiar with as a result of fire drills:-

1) Immediately warn other and evacuate buildings (s) area.
2) Attack the fire if safe to do so, with firefighting equipment provided, but without taking personal risks.
3) Contact the Quarry Manager.
4) Take decisions on containment. If it is a small fire, use fire extinguisher provided (Dry chemical such CO2). In the event of a large fire, employ water spray, fog or standard foam if available. In the event of a fuel fire, move container from fire area if possible without risks, cool containers that are exposed to flames with water from side until well after fire is out and stay away from ends of tank. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire.
5) Inform the principal (Owner/Operator)
6) Make entry into the Accident and Emergency Record book.

- **Scenario: Traffic Accidents**

There will be movements of boats on site. There is the possibility of accidents during the transport of material from the mining pits to the plant, stockpiles and wastes areas. However, if there is an accident the following procedure will be followed:-

1) Inform the Principal and/or Quarry Manager.
2) In case of injury, first Aid treatment to be applied.
3) Assess type of injury, i.e. broken leg, conscious or unconscious.
4) Arrange transportation to Diamond Hospital, East Bank Demerara.
5) Arrange Medivac to Georgetown if injury is severe.
6) Make entry into the Accident and Emergency Record book.

- **Scenario: Spill**

The quarry facilities will implement measurers to prevent and control spills.

The following measurers will be adhered to avoid incident of fuel spillage:-

1) Appropriate secondary containment devises and techniques (such as use of drip pans) will be implemented for the fuel transfer area (pumping station).
2) Principal owner operator will purchase oil-only spill response kits. Once in hand these kits will be place in strategic locations that are accessible to key personnel including driver, security officers, and health and safety officer.
3) Workers, mechanic and other staff will be trained on the proper use of these kits through the executions of drills.
4) Drip pans will be placed under the fuel/vehicle coupling when the vehicle tanks are being filled. This should prevent the possible leakage of fuel.
5) Attendants and operators will be trained regarding the proper use of the pumps to avoid overfilling and spillage. Training will also include the need and use of drip pans.

6) Fire extinguishers will be placed in strategic location in the event of a fire. These extinguishers will be regularly tested and refilled as necessary. All transportation staff, including boat captains, drivers and mechanics will be trained in fire emergency response procedure and the use of firefighter equipment.
7) The on-site fuelling area will be deemed a 'no smoking' zone and all staff required to turn off cell phones when in the general vicinity. The area will have appropriate signage in conspicuous locations at the loading site at the landing as well as on the site. All fuel storage containers will be labeled.
8) Storm water pollution prevention devices, particularly oil/water separators, will be placed in the drains which are likely to be contaminated with fuel in the event of a spill.
9) Procedures have been developed for the filling and dispensing of fuel. These must be implemented and continuously monitored. Fuel dispensing areas will be checked weekly for leaks. Leaks will be immediately reported and corrected. All in inspections and corrective action will be documented in an inspection log.
10) Prior to refueling of fuel storage tanks, cross checks of fuel records of tanks capacity based in fuel used will be completed. Additionally, the level of fuel will be manually checked, using a dip stick, so that there is clear indication of the capacity of the tank. This would prevent overfilling and possible spillage.
11) All fueling records will be kept up to date and on site.

- **Material Inventory – Spill Repot (Format)**

Material	Container (by volume)	Number of Containers kept On-site	Reportable Quantity for spills into water	Reportable quantity for spills onto land
Gasoline				
Diesel				
Motor Oil (Lube)				
Transmission Fluid				
Brake Fluid				
Greases				
Coolants				
Battery Acid				
Reactive, Oxidizers				
Detergents				
Waste water				
Hazardous materials (Specify)				
Other pollutants (Specify)				

8. REHABILITATION AND CLOSURE

The main aims of rehabilitation work are to:

a) Achieve long-term stabilization of all worked out areas to minimize ongoing erosion;
b) Re-vegetate all worked out areas with suitable plant species;
c) Minimize visual impact of disturbed areas; and
d) Ensure that worked out areas are safe for future uses.

The overall approach is to reduce environmental stresses over the life of the quarry by employing the best site maintenance practices.

This plan also presents best practices for a return of safety and natural stability to a closed quarry site. Meeting requirements for site closure will be easier if best practices are followed throughout quarry operations. This plan includes:

- Issues that create need for good site maintenance;
- Benefits of site maintenance and quarry closure best practices;
- Guidelines for best site maintenance practices ;
- Guidelines for safe and environmentally conscious quarry closure;
- Resources available for further information.

- **Key Closure Interventions**
  1) *Closure of Active Quarry Fact*: The active quarry face will be sloped at 1:15 (H: V) during operations to closely manage closure issues related to drainage. Quarry headwall will be partially backfilled with available material used to construct the roadside landing and overburden material within the quarry development area.
  2) *Approach Road, Haul Road and Landing Reclamation*: Approach and haul road and landing will be continually maintained throughout the life of the sand quarry. Systems would be put in place to prevent road deterioration. Roads will incorporate an improved road-bed (foundation) that permits the lighter transfer of wheel loads over the sub – grade so that the bearing capacity is not exceeded. In-pits roads will be constructed for single- lane traffic. Road side ditch line through the quarry development area will be re-established and grubbed out to convey surface flow so as to minimize erosion.
  3) Site Clean-up: Site cleanup works are to be undertaken after cessation of extractive operations include:
- Removal of all fixed and mobile plant;
- Removal of all temporary and permanent structures unless required for an agreed future use;
- Leveling of noise control bunds and overburden stockpiles;
- Removal and appropriate disposal of all waste materials including hazardous materials;
- Break up and burial or removal of concrete slabs;
- Rehabilitation of surplus roads, office sites, and hard standing areas;
- Identification of any hazardous or contaminated materials, and weeds;
- Approval to retain any of the above items, which may be consistent with the proposed final land use, would be sought from the regulatory authority.

Settlement erosion will continue long after extractive activities have ceased unless preventative measures are implemented. Poor drainage management can lead to damage or destruction of the rehabilitation investment. The best erosion prevention at a site is the establishment of re-vegetation.
5) Re-vegetation: Establishment of a self-sustaining cover of vegetation is the best low maintenance stabilizer of disturbed sites in the long term. Re-vegetation also minimizes the impact of visual intrusion.

Generally, the vegetation type that existed before the disturbance or a similar vegetation type will be most successfully afterwards, following an initial re-establishment period. Re-vegetation will be considerably easier to achieve where site preparation has been done well.

Where the establishment of forest is unreasonable, the objectives of re-vegetation would be:

a) To establish a native ground cover;
b) To prevent erosion on the site; and
c) To manage adverse visual impacts from critical viewpoints;
d) Decommissioning.

- **The Operator (Mr. Hakeem Mohamed) will ensure that:**
  a) The rehabilitation area is left in a stable, safe, nonpolluting state;
  b) The area is suitable for the planned final use or rehabilitation objective;
  c) Rehabilitation areas are not excessively affected by erosion;
  d) The Re-vegetated area is free from non-native tree species; and
  e) Vegetation is consistent with the final land-use.

9. FINANCIAL MANAGEMENT

9.1 Capital

A sum of US$100,000 is budgeted for repairs and rehabilitation of plant and equipment per annum from 2025 to 2029.

For the year 2025/2026 there will be some capital allocation to upgrade the wharf facilities at the landing in agreement with the residents at the water front. A sum of US50,000 is budgeted for maintenance and upgrade of the conveyor system and washing plant.

9.2 Operating Costs

The operating requirements of the mine is estimated based on the existing mine at sand hills at the following level:

Operating costs are sub-divided into:

Item	Description	Amount G$
1	Land clearing	30
2	Removal of overburden	30
3	Loading	35
4	Hauling	30
5	Maintenance	200
6	Fuel and Lubricants	325
7	Depreciation	29
8	Royalty	15
9	Management & Administration	45
10	Labor and Contracts	74
11	Miscellaneous	276
	Total Cost per ton GYD	**1,089**

9.3 Revenue

Base Case (Annual)

Average selling price of material per ton fob: $1,500

Revenue: 20,000 ton x $1,500 per ton = $30,000,000
Expenditure: 20,000ton x $1,089per ton = $21,780,000
Profit/Loss: Revenue – Expenditure = $8,220,000

10. MONITORING AND REPORTING

10.1 Monitoring

In addition to monitoring by the regulatory agencies the owner/operator will institute self-monitoring. Monitoring will be conducted prior to the implementation of the project to assess the baseline conditions. The rehabilitation and closure plan will be guided by Code of Practice for Environmental Management (Closure) prepared by GGMC. Water quality monitoring will be done daily at established sites and downstream tributaries on a monthly basis. The water quality reported will be sent to EPA/GGMC in a scheduled /timely manner.

10.2 Inspections

The Operator is prepared to work with the relevant agency to fulfill the following obligations:-

1) Productions record prepared for perusal;
2) all equipment's registration verified;
3) All employees verified;
4) Environmental compliance verified;
5) Mining operations implemented according to the submitted plan;
6) Compliance with Mining Act and Regulations;
7) Compliance with the permit;
8) Compliance with established Occupational Health and Safety procedures.

H. Mohamed.....

HAKEEM MOHAMED

DESCRIPTION

Approximately 500 acres of State land situate on the left bank of Dunoon Creek, left bank Demerara River; commencing at a point with coordinates **E353298 N713258**, being N271° 01' (tr.) 2115 meters from the confluence of the Dunoon Creek and the Demerara River, boundaries extends thence N268° 30' (tr.) 1734 meters to a point **E351565 N713197**, thence N174° 30' (tr.) 1342 meters to a point **E351686 N711873**, thence N82° 30' (tr.) 1551 meters to a point **E353225 N71207**, thence N03° 30' (tr.) 1187 meters to the point of commencement; as shown on an extract of map sheet No. 20SW attached.