SHERIFF STREET – MANDELA AVENUE EXPANSION PROJECTGUYANAENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP) FINAL

ACRONYMS

AASHTO American Association of State Highways and Transportation Officials

ADEI	Area of Direct Environmental Impact
BMC	BOSAI Mining Company
BOD	Biological Oxygen Demand
CBD	Convention on Biological Diversity
CDC	Civil Defence Commission
CEMCO	Caribbean Engineering Management Consultants Limited
CH&PA	Central Housing and Planning Authority
CLO	Community Liaison Officer
COD	Chemical Oxygen Demand
CTMP	Construction Transport Management Plan
DO	Dissolved Oxygen
DPMC	Development Policy and Management Consultants
ECM	Environmental Compliance Monitoring
EDWC	East Demerara Water Conservancy
EI	Environmental Inspector
EMS	Environmental Management Specialist
EPA	Environmental Protection Agency
EPM	Environmental Performance Monitoring
ERP	Emergency Response Plan
ESIA	Environmental and Social Impact Assessment
ESIR	Environmental and Social Impact Report
ESMP	Environmental and Social Management Plan
EU	European Union
GFC	Guyana Forestry Commission
GFS	Guyana Fire Service
GFDD	Guyana Food and Drug Department
GMSA	Guyana Manufacturing and Services Association
GoG	Government of Guyana
GPF	Guyana Police Force
GPL	Guyana Power and Light
GT&T	Guyana Telephone and Telegraph

GTA	Guyana Tourism Authority
GWI	Guyana Water Incorporated
IADB	Inter-American Development Bank
IAST	Institute of Applied Science and Technology
M&CC	Mayor and City Council
MLHSSS	Ministry of Labour Human Services and Social Security
MoH	Ministry of Health
MPW&C	Ministry of Public Works and Communications
MSDS	Material Safety Data Sheet
MUTCD	Manual Uniform Traffic Control Devices
NGOs	Non-Governmental Organizations
NRC	National Relief Council
NRMU	Natural Resources Management Unit
OSH	Occupational Safety and Health
PM	Project Manager
PMU	Project Management Unit
PAH	Polycyclic Aromatic Hydrocarbons
PSC	Private Sector Commission
ROL	Road Occupancy License
SC	Supervising Consultant
TCP	Traffic Control Plan
TMCPC	Traffic Management Concept Plans for Construction
TMP	Traffic Management Plan
VMS	Variable Message Signs
WSG	Work Services Group

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I. INTRODUCTION

1.1 BACKGROUND

This Environmental and Social Management Plan (ESMP) presents relevant, appropriate and applicable measures to avoid, mitigate and/or minimize the potential negative impacts associated with the Ministry of Public Works and Communications (MPW) preferred option and phases identified for the rehabilitating of the Sheriff Street – Mandela Avenue Road. The ESMP provides a management framework for the implementation, operation and closure of the project in accordance with environmental and social commitments, and legal requirements outlined within the Environmental and Social Impact Assessment (ESIA) report. In March of 2013, the Guyana MPW informed the Project Consultant Team, exp in association with CEMCO, that they had been selected to undertake the Sheriff Street - Mandela Avenue Roadway Design Project.

The Environmental Protection Agency (EPA) advocates the preparation of an Environmental and Social Impact Assessments (ESIAs)[1] to mitigate environmental impacts of road rehabilitation/construction projects of the type associated with the Sheriff Street – Mandela Avenue Road Project. Furthermore As part of the IDB safeguard Policies and Directives, policy B.3 for Screening and Classification requires that all bank financed operations shall be screened and classified according to their potential environmental impacts. The Sheriff-Mandela road expansion project interventions can be classified as Category B requiring an environmental and social analysis and an environmental and social management plan (ESMP).

The ESIA along with the ESMP must ensure that proposed procedures, actions and measures identified are not just a statement of intent but that they will be effectively implemented. The ESMP is mandated to:

- identify feasible and cost effective measures to reduce potential significant adverse environmental impacts,
- include operational procedures to avoid environmental risks during operations, and
- outline emergency and contingency plans to ensure appropriate responses in the event of accidents.

Sound enforcement of the ESMP is largely controlled by the MPW, the process should be overseen by the EPA. The ESMP has been prepared within the operating framework dictated by the EPA regulations, those of other legislative bodies for environmental and social management of road rehabilitation/construction, and the funding criteria and obligations to complete the project.

The success of the ESMP will rest heavily on active collaboration between MPWC staff, the EPA, the supervising consultant, the Contractor, the Contractor's EMS, sub-contracted staff or resources and the construction work force.

[1] The Environmental Protect Act of 1996 does not speak explicitly refer to the social impacts of the impact report or in the management plan (though they are implied), thus the reference to the Environmental Impact Assessment and the Environmental Management Plan. However, the IADB requires that particular attention be paid to social dimension of the project

1.2. DESCRIPTION OF THE PROJECT AREA AND PROPOSED DESIGN OPTION.

The Sheriff Street – Mandela Avenue roadway was constructed in the 1970's by the Ministry of Works, Hydraulics and Supply. It was initially constructed as a bypass for Georgetown. As such, it provided a through and direct connection from the East Bank Highway at the southwest end of Georgetown to the East Coast Highway northeast of the City around the commercial and residential areas. However, since the roadway was constructed the City has experienced considerable shift in growth to the east. As residential, industrial and commercial activity grew along the Sheriff Street – Mandela Avenue roadway, the demand for local access from the east and the west grew along the route.

The Sheriff Street – Mandela Avenue roadway is now comprised of a commercial mix of restaurants, night clubs, supermarkets, petrol station, and spare parts dealerships, *etc.*; institutions including a cultural centre, police station, schools, and an Embassy; industry including heavy equipment dealerships, a container terminal, a GWI plant and a GPL terminal; and various high density and private residences. This has created a chaotic mix of pedestrians and vehicle traffic of motorcycles, automobiles and heavy trucks. In commercial sections of Sheriff St, where there are no roadway shoulders, sidewalks and defined parking spaces, poor parking of vehicles restricts traffic flow. Heavy trucks and trailers parked on the road shoulder encroach upon the roadway along the section of Mandela by the container terminal. These conditions have all contributed to increasing traffic impedance and congestion, which have resulted in hazardous traffic passing and maneuvering and unsafe pedestrian conditions.

Improvements have been implemented over the years to address intersection safety and traffic movement. Traffic signals have been installed and intersections have been upgraded at many locations along the Sheriff-Mandela roadway. Although these improvements served to improve traffic flow, the high demands on the corridor warrant much more significant upgrades. Improvements including lane median separation, addition and/or widening of lanes, upgraded traffic intersection signals, street lighting, separation of turning lanes at intersection approaches, provision of pedestrian sidewalks and crosswalks, and delineated on-street parking and bus stops, are all roadway features necessary to facilitate the driving and pedestrian safety of the public attracted to the numerous businesses along the roadway.

THE MINISTRY OF PUBLIC WORKS' (MPW) GOALS AND INTENDED OUTCOMES IN EXECUTING THE ROADWAY UPGRADE ARE AS FOLLOWS:

Improve road safety;

- Better organize the flow of traffic and simplify traffic movements;
- Enhance the arterial function of the road while maintaining its commercial /industrial make-up;
- Provide adequate drainage for the road corridor and interdependent communities; and
- Extend the design life of the pavement and all roadway structures to a minimum of twenty years from the expected end of construction.

A Project Initiation meeting was held in Georgetown on March 26, 2013, with the Works Services Group (WSG) of MPW and the Project Consultant Team. Following the Project Initiation, a comprehensive review of the previous reports and data was completed, and the Project Inception Report and the Social Engagement Plan Framework, were prepared and submitted to WSG on April 18, 2013.

Based on the stakeholder review and the clients review the final designs were prepared. The final design involves construction of four lanes commencing from the East Bank turnoff, along Mandela all the way to

Lamaha canal. Following Lamaha canal two lanes will be constructed ending at the Rupert Craig Highway. Throughout the project corridor, sidewalks as well as a bicycle lane will be constructed.

Roadway Segment	**Cross-Section Elements**
Km 0+000 to Km 0+500 (0.5 km) Rupert Craig Highway to Railway Embankment Road	• One vehicle lane in each direction (3.5 m min. width) • One bike lane in each direction (1.5 m width) • Parallel parking on the west side of the street only (2.4 m width). • Sidewalk on the west side of the street (2.5 m wide sidewalk and utility area) • Centre median
Km 0+500 to Km 1+400 (0.9 km) Railway Embankment Road to Cummings Canal	• One vehicle lane in each direction (3.5 m min. width) • One bike lane in each direction (1.5 m width) • Diagonal parking on both sides of the street (6.0 m width) where feasible. Parallel parking provided at some locations due to property constraints. • Sidewalk on both sides of the street (2.5 m wide sidewalk and utility area) • Centre median
Km 1+400 to 2+200 (0.8 km) Cummings Canal to Lamaha Canal	• One vehicle lane in each direction (3.5 m min. width) • One bike lane in each direction (1.5 m width) • Parallel parking on one side of the street (2.4 m width) • Sidewalk on both sides of the street (2.5 m wide sidewalk and utility area) • Centre median
Km 2+200 to 4+640 (2.44 km) Lamaha Canal to David Rose Street	• Two vehicle lanes in each direction (3.5 m min. width) • One bike lane in each direction (1.5 m width) • Sidewalk on both sides of the street (2.5 m wide sidewalk and utility area) • Centre median • No On-Street Parking
Km 4+640 to 6+670 (2.03 km) David Rose Street to East Bank Highway	• Two vehicle lanes in eastbound direction (3.5 m min. width) • One vehicle lane in westbound direction (3.5 m min. width) • One bike lane in each direction (1.5 m width) • Parallel parking on the north side of the street (2.4 m width) • Sidewalk on the north side of the street (2.5 m wide sidewalk and utility area) • Centre median

In addition to the above basic cross-section elements, the following additional features were integrated throughout the corridor:

- Separate right turning lanes at major intersections. The minimum turning lane width is 3.0 m. Length of lanes was based on traffic demands, available width, and centre median considerations;
- Pedestrian crossings were provided at all major intersections as well as at some minor intersections and mid-block locations. Three pedestrian crossing treatments are proposed:

- Signed and marked crossing treatments (at minor intersections and mid-block locations). Where possible, the centre median will be used as a refuge area for pedestrians so that crossings can be made in two stages (crossing one direction of travel at a time).
- Signalized crossing treatments (at signalized intersections); and
- Grade separated crossing treatment (one is located on the project corridor, at the Multilateral Secondary School.
- Bus Stops have been delineated throughout the corridor, located in each direction every 2 to 3 blocks, as requested by WSG. Two types of bus stops have been designed:
- Bus stops through roadway sections with on-street parking are located within the parking lane and delineated by signs and pavement markings only; and
- Bus stops throughout roadway sections with no on-street parking are designed with bus bays, a physical bump-out of the curb. Bus bays provide a space for bus boarding and alighting that is separated from the travelled lanes.

The Proposed design also includes construction of bridges and culverts and other additional road features which is described in the ESIA Document.

1.3 PURPOSE AND NEED

In keeping with the legal requirement as contained under the Environmental Protection Act of 1996, Schedule 4 and the stipulation of the IADB, an ESMP is required for the detailed designs with regards to the rehabilitation/construction of the Sheriff Street – Mandela Avenue Road Project. This ESMP follows requirements of the Terms of Reference as shown in Appendix II.

1.4 OBJECTIVES

The primary objective of the ESMP is to emphasize the significant social and environmental impacts and to indentify mitigation measures and actions recommended to eliminate and minimise these impacts with costs and responsibilities involved. The budget is broken down by activity and identifies sources of funding as per the Terms of Reference.

1.5 METHODOLOGY

In conducting this aspect of the consultancy the main approach was to use information contained in the ESIA and the MPWC's preferred Option to guide the ESMP's development. Since the ESIA contains a detailed discussion of the potential impacts both 'with' and 'without' mitigation, and during various phases of the project depending on the option pursued these were not repeated within the ESMP[2].

Additionally, the consultant used information from previous national ESMP's and the prevailing costs to assist with the costing of the various implementation interventions.

[2] It is important to note that the Client's preferred option was a hybrid between Option 1 and Option 3. Hence, the issues related to those Options are also relevant to the Client's preferred Option.

2.0 ENVIRONMENTAL IMPACT IDENTIFICATION METHODOLGY

Albeit beneficial and much needed, the construction and operation of improved Sheriff- Mandela road network can also bring many unintended consequences during the construction and operation phases. To determine the possible impacts of the project during the project phases an ESIA study was conducted using different methods and approaches. Field studies were carried out to determine and evaluate impacts of the project based on direct observations and professional judgment. A comprehensive content review of pertinent literature and some desktop techniques were used to complement or supplement field data where it was not available. In addition, extensive public consultations were carried out to capture public views and concerns about the proposed projects. The objective was to interview individuals and institutions that are interested in the project or are likely to be affected by it in order to understand their concerns and suggestions on the project. During the construction phase, nuisance including increased noise, dust, reduced access to businesses and traffic congestion can be expected.

The ESIA concluded that most of the negative externalities will be experienced during the operation phase. During the construction phase, impacts include dust and noise pollution, traffic congestion, reduction in parking, possible impacts on business etc. Consequences of the project during the operation phase include congestion, increased speeds due to improved traffic flow, and increased respiratory aggravations from emissions associated with a growth in fossil fuel generated vehicles. As such, to minimize, reduce or eliminate these unintended consequences and amplify the positive impacts, a detailed ESMP has been prepared for this project. The preparation of a comprehensive environmental management plan will ensure that the contractor is properly guided through the process of environmental management for the project. Indicative costs for implementation of this plan will be included with clear outline of responsibilities and time frames.

ENVIRONMENTAL IMPACTS

From baseline information collected during the preparation of the ESIA Report potential impacts were identified that will require mitigation, through best practice during construction or through special measures employed as part of the contracted work.

Impacts on the environmental components have been categorized into positive and negative impacts and further into direct (noise and dust pollution) and indirect impacts (generation of increased economic activity along the rehabilitated roadway). Additionally it is important to distinguish between short- and long-term impacts occurring during the pre-construction, construction and operational phases of the project.

Activities to be carried out during each stage of development are further divided into:

- Detailed design mitigation;
- Implementation/installation of mitigation measures;
- Response to incidents or unforeseen issues arising e.g. spills, emergency situations, chance finds (construction stage only);
- Routine daily and weekly inspections;
- Review of ESMP and Construction Environmental Management Plan (CEMP);
- Performance and compliance monitoring and response to any corrective actions;
- Reporting – Daily Inspection Logs, weekly reports, monthly reports and quarterly reports in conjunction with Contractor's project management administration procedures.

The ESMP should be applied as a document that provides direction on the management of the environment and social relationships to construction, inspection and management personnel throughout the construction and operational phases of the project. The ESMP sets out the condition that the project is expected to follow to meet legislation, regulations and best practice for sustainable management of the project. The goal of the ESMP, therefore, is to reduce adverse impacts on both the physical environment and affected stakeholders as identified n the ESIR. This ESMP is a legally binding document and the actions contained therein are expected to be followed by the Contractor(s), who will need to demonstrate their commitment through the adoption of this ESMP and the development of a CEMP for the stages of the project, for which they have responsibility.

The Contractor(s) will need to include the compilation, implementation and the administration of the ESMP on the site, including training of the site team on their environmental duties and responsibilities.

For ease of reference, a summary of environmental positive impacts and negative impacts which will require mitigation that the Contractor(s) will be required to follow and which are described in detail in the ESIR are highlighted below.

Medium	Construction Phase	Affected Community.	Type of Impact (Direct/ Indirect)	Significance before mitigation/enhancement						
				D	I	O	E	Du	R	Total
	Negative Impacts									
Atmospheric	1. Increased air pollution (dust)	Persons with respiratory ailments and small children	D	2	2	3	2	1	2	-12
	2. Increased air pollution (toxic fumes from vehicular traffic and construction and vehicular waste)		D	2	2	3	2	1	2	-12
	3. Major noise nuisance along project route	Schools and residents within the ADEI	D	2	2	3	2	1	1	-10
	- during the mining of raw materials and transport	Residents in the AIEI	I	2	2	2	2	1	2	-11
Geology, Soils and Topography	4. Indiscriminate disposal of waste	Residents in the ADEI	D	2	2	3	2	1	1	-9
	5. Soil erosion due to removal of vegetation associated with change in the road alignment	Residents in the ADEI	D	2	1	3	2	2	2	-12
	6. Contamination of soil profile from	Residents in the ADEI								
	- toxic waste from construction material		I	3	3	2	2	1	1	-12

	- fuel and other vehicular waste		D	2	2	2	2	1	1	-10
	- lubricants and detergents etc.		D	1	1	1	1	1	1	-6
	7. Land clearance	Residents in the ADEI								
	- for the storage of raw materials		D	1	1	2	1	1	1	-7
	- construction of camps		D	1	1	2	1	1	1	-7
Water Resources	8. Increased flooding due to water diversion and increased run off	Physically challenged, the elderly and children	I	2	3	2	2	1	1	-11
	9. Water Pollution	Children and residents in the ADEI								
	- suspended solids and burial of waste		I	2	3	3	2	2	1	-13
Biodiversity	10. Ecological damage resulting from route deviations, construction works and clearance	-	D	1	1	2	2	3	3	-12
	11. Migration of wild life	-	I	1	2	1	2	2	1	-8
Socio-Economic	12. Congestion of the roadway, particularly at peak hours	School children and the elderly	D	1	1	2	1	1	1	-7
	13. Increased traffic through side streets	Children	D	3	3	3	2	1	1	-13
	14. Increased time and cost to get to destination during construction	Housewives, Single parents, school children and workers generally	D	2	2	2	2	1	1	-10

	15. Reduction in commercial activity	Businesses along the project route	D	2	2	3	3	2	2	-14
	16. Displacement of road dwellers and those encroaching on the road reserves	The homeless and destitute and small-scale operators	D	2	2	3	2	1	1	-11
	17. Damage/disturbance to sites of cultural and historical significance	-	I	2	2	2	2	1	1	-10
	Positive Impacts									
Socio-Economic	1. Short term job creation for residents in neighbouring communities		D	2	3	3	2	1	1	12
	2. Increased demand for supply for raw materials from local quarries and mining sector		D	2	1	3	2	1	2	11
	3. Enhancement in property values		I	3	3	3	2	2	2	15
	4. Improved road safety		D	3	3	3	3	2	2	16
	5. Reduced congestion along some routes		D	3	3	3	2	3	1	17
	6. Better signage and traffic management than current obtains		D	3	3	3	2	2	2	13
	7. Improvement in utilities (GWI)		I	2	2	3	2	2	2	13
	8. Improved road structure		D	2	3	3	2	2	1	13

	Operational Phase			**Significance**						
	Negative Impacts									
Socio-Economic	1. Speeding	Children, the elderly and the physically challenged	D	3	2	3	3	2	1	-14
	2. Damage/disturbance to areas cultural and historical value	-	I	3	2	2	2	3	1	-13
	3. Disruption of commercial activities	Businesses	I	3	3	2	2	2	1	-13
	4. Increased conflict between patrons and/or proprietors seeking to park along the project route	Businesses and residents along the project route	I	2	2	2	2	1	1	-10
	5. Increased pollution and indiscriminate waste disposal increased traffic flow	All communities in the ADEI	I	2	2	2	2	2	2	-12
	Positive Impacts									
Socio-Economic	1. Reduced Accidents	-	D	3	3	3	3	2	2	16
	2. Improved traffic flow	-	I	3	2	2	3	2	2	14
	3. Reduced travel time	-	I	3	3	3	3	2	2	16
	4. Improved road safety	-	D	3	3	3	2	2	2	15

	5. Reduced transportation cost	-	I	3	3	2	3	2	2	15
	6. Presence of traffic signs and enforcement of traffic regulations	-	I	3	2	3	3	1	2	14
	7. Lower maintenance cost on vehicles	-	I	3	3	3	3	2	1	15
	8. Improved pedestrian facilities	-	D	2	3	3	2	2	2	14
	9. Improved parking facilities	-	D	2	3	2	2	2	2	13

3.0 MITIGATION ACTIONS, STRATEGIES AND PLANS

The ESMP incorporates protection, mitigation and enhancement measures. The avoidance and mitigation measures include:

- Engineering designs, specifically roadway design features and disposal techniques,
- Pollution control, recycling, and monitoring of scientifically sensitive areas and resources, and
- Enhancement of the physical environment, where possible, and community involvement.

Additionally, the ESMP outlines a separate monitoring framework to assess the effectiveness of the Plan over time. The monitoring framework will determine whether the ESMP requires reorienting, based on changed conditions or factors not necessarily accounted for in the Plan. The ESMP's purposes therefore are:

- to reduce the risks of adverse impacts that may be associated with the project on environmental resources, and
- to minimize disturbance to local residents.

The stakeholder's consultation process which is still ongoing played a major role in identifying critical issues that would be addressed herein. Recognizing the importance of public participation, a total of eleven (11) stakeholder consultations have been held over a two month time-frame (May 16 - July 11). Consultations were conducted with key stakeholders, inclusive of project staff, donor representatives, public officials, private sector representatives, and non-governmental organizations.

In addition to consultation much has been discussed with regards to the project, including project description, status, road design standard and construction, and construction methods in the ESIA report. The national environmental regulation, the Inter-American Development Bank's (IADB) requirements and socio-physical environment are described in the ESIA report and the methodologies employed in accessing the necessary information. As such, no further discussion on the project's justification and importance of the project is deemed necessary. For a complete and thorough discussion of the above listed information readers are encouraged to consult the ESIA report. Furthermore, the impacts that will require mitigation interventions are captured in the Environmental and Social Impact Report (ESIR) and are not repeated here. Users of the ESMP are therefore strongly encouraged to read the ESMP in conjunction with the ESIR.

This section provides the outline content and contract requirement of plans and strategies with reference to environment and social management that the Contractor is to ensure these are developed and approved prior to the commencement of work. These will be required to be followed and update periodically to remain current for the life of the project when necessary and implemented through training to the on-site supervising team which includes record of consultation with the associated bodies and representatives as highlighted in the preceding sections.

The following section identifies actions that will be required by the Contractor for construction to be managed following the mitigation for the environmental and social receptors identified within the ESIR. There will need to be contingencies in place for unforeseen incidents. In most cases mitigation has been addressed through the design process, the majority of actions will be to ensure appropriate equipment and preventative measures to minimise or avoid a social or environmental impact are in place.

The EMP will provide Plan for the following key areas.

- Waste Management Strategy;
- Petroleum and Hazardous Waste Management;

- Traffic Management Plan;
- Emergency Response Plan;
- Health and Safety Plan;
- Training and Induction Plan; and
- Monitoring Responsibilities.

3.1 GENERAL GOOD PRACTICES

Successful Contractors that are awarded the Civil Works contract should be subjected to some level of screening to ensure they have a sound understanding of the rigors of implementing an EMP. Most construction companies in Guyana operate without a company's Environmental Policy; hence there is no appreciation within the organisation to strive for best practices. The lack of company policies also hinders the effective implementation of the EMP. The principles outlined below are good general best practices that should be employed by the successful contractor.

- Ensure that sewage, refuse (domestic and construction) and chemical wastes are disposed in a manner approved by all authorities having jurisdiction; it is important to recognise that construction works will be executed in one of the busiest thoroughfare in Georgetown i.e. Sheriff- Mandela, it is imperative that waste management be approached in a comprehensive manner to ensure that construction and other debris is not left on the roadway or adjacent to business premises or other buildings.
- Conduct all operations in such a manner that there are no unauthorised discharges of any sort (liquid or solid) into waterways; Throughout the project corridor there are a number of canals including the Lamaha canal which supplies Georgetown water supply, it is important to safeguard this water source by employing a " zero tolerance to Pollution" approach.
- Undertake work in compliance with the plans approved by MPW, the Project environmental permit and the IDB guidelines.
- When night work is done anywhere on the project corridor, all necessary safety measures to be put in place to ensure the safety of the public.
- Access to premises throughout the corridor remains critical to ensure continuity of business, the successful contractor is required to ensure that access is provided to all properties adjacent to the site for the duration of the contract
- The Contractor should acquaint himself with the position of all existing services such as sewers, surface water drains, cables for electricity and telephone and lighting poles, water mains and the likes before commencing excavation or other work likely to affect the utilities. This remains critical given the number of business along the Sheriff-Mandela route.

3.1.1 EROSION AND COMPACTION MEASURES

The following measures should be implemented to reduce the impact of erosion and sedimentation activities:

- Minimise removal of vegetation to areas where it is absolutely necessary especially around the 90 degree turn approaching Mandela.
- Monitor areas of exposed soil during periods of heavy rainfall, this is particularly important during construction of bridges and culverts, excavations works can lead to erosion of slopes.
- Slopes should be constructed at the recommended angle to prevent collapse.
- Use appropriate machines for all earth works.
- Designate routes for heavy duty equipment to prevent compaction of soil.

- If ponding is observed due to compaction, it may be necessary to scarify the topsoil.
- Consider the weather pattern before initiating major earthworks. Earthworks should be avoided during periods of heavy rainfall. This is important also to reduce excessive muddy conditions on the roadway; this can be hazardous to road users.
- Construction activities on the Lamaha Canal embankments should be done in a manner as to not affect the integrity of this structure.

3.1.2 WATERCOURSES

In order to protect the integrity of the water supply in the Lamaha canal the following measures should be implemented during construction.

- Minimise and contain suspended sediment within the immediate zone of construction, berms should be used to protect stockpiles that are close to canals. The Sheriff Mandela corridor is constrained for space and the contractor may not be able to observe the regulation of not placing stockpiles less than 10 m close to a waterway. In cases where this in unavoidable, adequate berms should be constructed.
- Ensure drainage channels for domestic purposes are protected from damage at all times and that flow is not hampered by construction works. Drainage shall be controlled and monitored during construction to maintain proper water levels through adequate structural support systems. Water bodies should be free of obstruction and normal flow of water maintained.
- In areas where the space permits (Mandela in some areas) all waste storage stockpiles or stockpiled material shall not be placed within 10m of any watercourse and shall have a toe berm construction around.
- Significant volumes of dewatering effluent (greater than 3 litres/second) shall be discharged into a “filter bag” that’s designed to retain or filter sediment while gradually releasing water.

3.1.3 DEWATERING

Dewatering may be necessary if trenches[3] become filled with water due to heavy rainfall, to resume construction the site need to be free of water.

- The discharge of dewatering effluent can result in scouring and erosion at point of discharge as well as sediment loading to the Demerara River or the adjacent roadside drains.
- Significant volumes of dewatering effluent greater than 50 gallons per minute shall be discharged into a filter bag that is a geotextile bag to retain or filter out sediments.

3.1.4 NOISE

As identified in the impact section, noise will be a significant environmental impact that requires mitigation; this is mainly due to the fact that the roadway is in such close proximity to buildings throughout the corridor and also the construction of bridges will require installation of piles. The EPA, in collaboration with GNBS, has developed Guidelines for Noise Emission into the Environment. The Standard specifies noise limits for construction activities both for daytime and during the night. The daytime limit (06:00hr – 18:00hr) is 86 dB

[3] Trenches in this context refers to trenches excavated for pile driving activity.

while the limit in the night is 75dB. Given the proximity of residents to the activities locations noise is anticipated to be a significant problem.

- To comply with the National Standard and reduce this impact the following are measures should be implemented:
- Provide hearing protection to workers exposed to high noise levels such as those involved in demolition.
- Provide earplugs for employees who operate heavy duty machines.
- Employees working in high noise levels areas should be mandated to wear earmuffs or earplugs as required.
- Ensure that machinery and equipment are working efficiently and have installed the required muffler devices.
- Work should be limited to daylight hours; works in the night can affect neighbouring houses. If night work is absolutely necessary community consultation should be done to get a consensus on the best day and time for such activity.

3.1.5 DUST

Dust, though localised, is a potential impact that would require some level of mitigation.

The following measures should be implemented to reduce the impact of dust on the environment:

- Personnel working in dusty environments should be required to use respirators.
- During dry periods it may be necessary to soak routes traversed by vehicles and equipment. Dry areas should be soaked as necessary, depending on the weather condition.
- Materials should be transported to site as needed thus resulting in small stockpiles.
- All trucks transporting construction materials should be covered.
- If necessary, the stockpile would also be soaked with water periodically.
- The burning of construction waste and cleared vegetation should be prohibited to avoid smoke nuisance.

3.1.6 FUEL, LUBRICANTS AND CHEMICALS

Fuel and lubricants are classified as hazardous materials and require special consideration in terms of transportation, storage and handling. The following measures should be implemented to ensure the risks of contamination of soil or water from spillages are minimised:

- Since the construction activities would be temporary and fuel storage will be moved as activities progress, it would not be feasible to construct proper facility for fuel storage. As such, it is recommended that fuel be transported to the site as needed or in small quantities.
- Fuel which will require storage should be sited a safe distance from waterways; especially the Lamaha and other canal within the project corridor, site offices and work areas and should be elevated to detect any leaks.
- Care should be taken to prevent spillage and leakage of fuel during off loading and refuelling. When refuelling is completed, all nozzles, hoses and other materials should be stored in a proper manner to avoid spills.
- Drip pans can be placed under the fuel/vehicle coupling when vehicle tanks are being filled. This should prevent the possible contamination from leakage of fuel.
- Regular maintenance of machinery should be done to avoid leakages.
- Spill kits should be made available in the event of spillages.

- Workers, mechanics and other staff should be trained on the proper use of these kits.
- Adequate signage should be installed in fuel storage areas such as No Smoking and Flammable Materials.
- Fuel storage tanks/containers should be monitored for leaks.
- Fire containment measures such as extinguishers or sand buckets should be place in fuel storage/re-fuelling areas.
- The on-site fuelling area should be deemed a 'no smoking' zone and all staff required to turn off cell phones when in that general vicinity.

3.1.7 WASTE MANAGEMENT

Several types of waste can be generated from the various construction activities that would require different methods of disposal. The hazardous waste cell at the Haags Bosch Sanitary landfill is not operational currently; this may pose a problem for disposal of soils contaminated with petroleum products as stated in the Contaminant Assessment Report. It is recommended that such waste be stored for future disposal.

Domestic and construction waste can be disposed at the Haags Bosch Sanitary landfill site. A detailed waste management strategy is presented in this ESMP.

3.1.8 HEALTH AND SAFETY

Guyana's policy on health, safety and welfare can be inferred from early ratification of two key International Labour Organization (ILO) conventions: Labour Inspection Convention, 1947 and Labour Inspection (Construction) Convention, 1969. These cover numerous labour-related issues such as hours of work, wages, working age, health and safety, holidays, unions etc. hence, Occupational Health and Safety is a significant issue at construction facilities and require several measures to be implemented to ensure the activities are safe to both the workers and the general public. A detailed H & S Plan is prepared as part of this EMP.

3.2 WASTE MANAGEMENT STRATEGY

It is appreciated that the effective management and disposal of solid domestic wastes, including food waste, packaging, office wastes, paper, etc., is essential to reduce the volume of materials to be landfilled/incinerated. The Contractor's EMS will develop a strategy for the management (including collection, separation and storage) and disposal of solid domestic wastes. It is anticipated that with the presence of work camps some of this waste will be generated and will require management.

During the Project implementation, there are several types of waste that would be generated from the various activities that would require different methods of disposal. The following are some of the waste materials that shall be generated during construction which shall require managing:

- Vegetation stripping
- Dimension lumber
- Containers for various construction materials (e.g. asphalt, concrete and steel)
- Pallets
- Waste oil, filters, lubricants and hydraulic fluids
- Steel end pieces
- Food waste
- Sewage

Hazardous Waste

Improper disposal of waste could result in releases to the environment and the presence of vectors and vermin along the project site. The following waste will be generated by the project:

- overburden during rehabilitation,
- solid waste, including food waste from the camp operations, and
- septic waste from the camp operations.

CONSTRUCTION WASTE MANAGEMENT

Below are the waste management practices to be employed during the implementation of the project:

- All organic and inorganic materials shall be collected, stored and disposed of in an environmentally acceptable manner.
- Construction debris and other waste shall not be allowed to accumulate on the construction site but shall be collected promptly and regularly removed from the site by the Contractor. Construction debris shall not be stockpiled longer than 30 days after initial placement.
- No burning of waste onsite shall be done. All waste shall be collected and disposed of at the Haag Bosch Landfill.
- Waste materials shall be collected and stored in suitable containers until they are disposed. No waste stockpiles shall be placed within 10 m of any existing water bodies. The Contractor shall implement all measures to ensure that waste generated is reused and recycled, where possible.
- Construction waste such as formwork and lumber shall be reused where possible. Wooden materials that cannot be reused shall be transported to the landfill.
- Steel end pieces shall be temporarily stockpiled and subsequently disposed at the landfill site.
- Excavated material shall be properly drained, spread and trimmed to a stable slope not exceeding 1.5 to 1, in a manner which minimizes disturbance to watercourses and vegetated areas. In cases where excavated material shall not be reused, the Contractor shall donate the material to the NDC or nearby residents.

Domestic

- The Contractor shall provide an adequate number of waste collection receptacles on site. Receptacles shall be strategically placed on site to ensure that waste is not haphazardly dumped on site. Waste shall be disposed at the Haags Bosch Landfill Site. The Contractor shall transport waste to this facility or alternatively, can investigate the option of hiring a private disposal service (Cevons or M&CC collection system) to collect the accumulated waste. All domestic waste will be removed on a weekly basis. All food wastes will be collected and stored in containers and regularly transported to the landfill.
- Toilet facilities in the form of portable toilets will be provided for workers. These portable units will be emptied by a waste disposal company when required.
- Hazardous Waste
- Several types of waste which may be classified as hazardous will be generated during the project. However, the generation of these waste types will be extremely limited. Below are the disposal options for these waste types.

Used oil Filters

- Waste oil and refuse generated during the servicing of equipment (e.g., air and oil filters, hydraulic fluids, oily rags and petroleum products) should be properly collected, stored, transported and

disposed of. All waste oil and petroleum products will be collected in sealed five gallon containers. A special area at the Contractor's site office/storage facility should be designated to store waste oil. The oil would be stored until an acceptable disposal option is available, including reuse.

- Used oil filters are to be removed and placed in sealed containers and disposed at an approved facility. The Contractor should ensure that oil generated from used filters does not contaminate the environment and caution should be exercised during the maintenance of machinery. Maintenance work on machinery will not be done in close proximity to any water body.

Used Batteries

- The used batteries are to be stored until a proper disposal method is agreed upon.
- Used Tires
- The used tires can be temporarily stored on site and then transferred to the Haag Bosch landfill site.

Disassembly of Construction Site.

After completion of construction works at all sites the contractor will demolish and remove all temporary site offices, storage facilities and camps. Demolished material will be donated to the local N.D.C and nearby residents. Materials that cannot be reused will be burned or dumped at the local approved landfill site.

The EMS will also be responsible for the implementation of this strategy and will work in close collaboration with the Mayor and City Council (M&CC) and the EPA in identifying adequate and appropriate ways of disposing this waste. Furthermore, they will work with the M&CC in identifying appropriate places on the camp site designated for human effluent.

All workers, before the commencement of work will be instructed in the manner to dispose of their personal and worksite related waste. The impacts are projected to be localised, short term, with a high likelihood of occurring and a low level of impact. The domestic waste management strategies shall apply to all personnel and visitors who are involved in the generation, storage, handling, transportation or disposal of domestic waste materials.

3.3 PETROLEUM AND HAZARDOUS WASTE MANAGEMENT STRATEGY

Significant volumes of fuels and lubricants would be used by vehicles and equipment in the project. It is appreciated that fuels and lubricants have properties that can result in adverse environmental impacts if they are accidentally spilled or improperly handled. This applies to all personnel and contractors, who are involved in the transportation, handling, use and clean up of fuels and lubricants. The potential impacts from improper petroleum products management are projected to be short-term with a high likelihood of occurrence and having a moderately severe impact. Accordingly, mitigation measures are required.

To ensure the safe handling and transportation of fuels and lubricants and to minimise the potential for the accidental introduction of fuel and lubricants into the environment the Contractor's EMS shall develop a strategy for the disposal and handling (including storage) of hazardous waste inclusive of fuels and lubricants, used tires, etc generated during and after construction.

The EMS will Fuels and lubricants will also be responsible for the implementation of the strategy, inclusive of secure storage facilities in a designated area along the project route to prevent accidental release and protect against rainfall that may result in contaminated run-off and leaching and recycle/re-use of some materials and/or disposed of in an environmentally appropriate manner at the Haag Bosch Landfill site.

Furthermore, all materials management personnel will be provided with induction training and periodic training in the proper handling of fuels, lubricants, chemicals and any other hazardous materials used during construction, including spill reporting, emergency response and spill clean-up procedures detailed in this ESMP. Mock spill response exercises shall be conducted at the initiation of construction and every 6 months thereafter, for the duration of construction.

Any material not considered hazardous will be taken to the Municipal Landfill site to be deal with like most other domestic waste.

3.4 TRAFFIC MANAGEMENT AND ROAD SAFETY

It is anticipated that during rehabilitation there will be some level of congestion along the road corridor. This is likely to result in many drivers seeking to use side streets to avoid the project site during rehabilitation. This will result in some of these streets having greater flows of traffic than is normally the case as well as compromising the safety of road users in many of these areas. Furthermore, the ESIR details the

Accordingly, the Contractor, with assistance from the EMS and in consultation with relevant stakeholders and the MPWC will develop a traffic management plan (TMP). This TMP will address traffic both along the rehabilitated structure and possible diversion routes, built up areas and side streets to reduce conflicts and disruption to commercial activities. Furthermore, TMP will also be expected to address pedestrian traffic, addressing road safety and minimal disruption of commuter traffic and the cost of transacting their daily chores. The following key recommendation should be implemented by the contractor.

Throughout the course of the works the Contractor will be responsible for the safety of all persons present on the site of the works. As such, the Contractor shall ensure, as far as is reasonably practicable and to the satisfaction of the engineer, the health, safety and welfare of employees, including those of sub-contractors and all other persons on the site.

The responsibilities undertaken shall include.

- The Contractor is required to perform work in a manner that ensures the safety and convenience of the public and protects the residents and property adjacent to the site. The Contractor is required to allow the safe and unrestricted flow of public traffic on roads adjacent to and within the site until works are taken over by the Client.
- Throughout the project the Contractor shall ensure that the public road remains open and available for use in good condition and that delays to traffic are minimized.
- The Contractor is required to keep existing roads open to traffic during construction operations but may bypass traffic over a detour of equal standard when approved by the engineer. The Contractor is required to cover the cost of all diversions.
- The Contractor is required to keep roads and sidewalks affected by the activities free from soil and material spillage and ensure that construction areas can accommodate traffic safely at all times. The Contractor is required to erect and maintain signs, barricades, and other traffic control devices as may be required to guide traffic inside and outside work areas and as indicated by the Manual of Uniform Traffic Control Devices, Part 6- Temporary Traffic control or as by directed by the Engineer. The Contractor is required to replace traffic control devices that become lost, stolen, destroyed or deemed unacceptable while their use is required.
- During non-working hours and following completion of a particular construction operation, all warning signs, except those necessary for public safety, are required to be removed. Retro-reflective and painted surface on signs barricades, and other devices is required to be kept clean, in a good

state of repair and retain their retro-reflective ability at all times. Sizes, colours, messages and locations are required to all be to the approval of the engineer.

- The Contractor shall take care at all times to ensure the convenience and safety of residents along and adjacent to the road and any public highway affected by the works. Access to property adjacent to any work site shall be maintained at all times.
- The Contractor in having the responsibility for understanding the current traffic situation and establishing the requirements for traffic control and safety has already done so. As such, the Contractor is now familiar with the existing traffic conditions, the importance of maintaining traffic safety and minimizing traffic delays by co-operating with pertinent traffic control agencies. In this regard, this Traffic Control Plan has been developed.
- Furthermore, the Contractor will outline a detailed Construction Traffic Management Plan (CTMP) for the rehabilitated structure derived from the TMP and the Traffic Management Concept Plans for Construction (TMCPC). The TMCPC will also include any associated Road Occupancy License (ROL) Applications and Speed Zone Authorizations supporting the TMPs that require submission to the Work Services Group (WSG) for consideration and approval. The TMPs will contain detailed drawings describing the individual Traffic Control Plans (TCPs).
- Both the TMP and the CTMP must have the approval of the Guyana Police Force (GPF) before being implemented.

The Traffic Management Plan Should cover the following areas and be guided by the recommendation described below.

3.4.1 TRAFFIC CONTROL SCHEDULE

The Contractor shall prepare a traffic control schedule that documents anticipated traffic control activities for the construction period. The schedule shall provide brief descriptions of the traffic control activity (e.g. lane width reduction, lane shift, and detour), its location, approximate implementation date and duration. This shall be submitted to the Engineer prior to construction for approval. Attached in Appendices are recommended detour routes for traffic during construction. Also attached are areas that would facilitate parking during construction.

3.4.1.1 OBSTRUCTION OF TRAFFIC

The Contractor shall ensure that the flow of traffic is unimpeded by construction-related activities. Two lanes of traffic shall be maintained at all times where practical. In cases where it is absolutely necessary to close the road to facilitate the works, the contractor shall ensure that closure of one lane is done only for short periods. Alternative access though the parallel streets adjacent to Sheriff Mandela (see attached plans in Appendix) should be explored for alternative routes during construction. This should be done in consultation with the police. During lane closures, the flow of traffic shall be controlled by flaggers with stop and slow signs to ensure that undue delays are avoided. Using the parallel and other secondary street will require upgrading works as some areas are in a deplorable state; this was of particular concern during the stakeholder consultations.

The lane width in some sections of Sheriff and some part of Mandela Corridor can be increased by temporarily grading and backfilling the existing road shoulder on both sides of the carriageway. Temporary road surfacing material shall be used to widen the road shoulder. All diversions, widened shoulders shall be maintained throughout the duration of construction works. If the option of widening the carriageway is not feasible in areas of limited space the option of diverting traffic through the secondary roads in the project area should be explored. Contractors will be required to ensure that all secondary roads used for traffic diversion are maintained throughout the construction phase and is required to present to the consultants a maintenance

schedule. Additionally from previous experiences the best surfacing material to be used which requires least maintenance is Asphalt, this should be a condition by the WSG.

3.4.1.2 CONSTRUCTION AND ADVISORY SIGNS

It is the responsibility of the contractor to install, maintain and remove of all works-related signs. All signs shall be made in accordance to the Manual of Uniform Traffic Control Devices (MUTCD).Sign panels shall be orange with black legend and be mounted on stands. The location and type of each sign shall depend on the area of placement.

3.4.1.3 FLAGMEN

At each construction site traffic flow shall be guided by flagmen with STOP/GO signs when necessary. At the site traffic flow shall be two-directional.

3.4.1.4 LIGHTING

Any existing roadway lighting that is disturbed during construction shall be replaced with sufficient temporary lighting to illuminate the same roadway surface. Adequate lighting shall be provided for approved night works to ensure the safety of road users and construction workers. The sheriff Mandela corridor is particularly busy at night and it is important to ensure that all lights remain functional.

3.4.1.5 ACCOMMODATION OF PEDESTRIANS AND CYCLISTS

The Contractor shall make provision for pedestrians and bicycles to have safe access across the work zone at all times. If this cannot be readily accommodated then detours shall be provided. This shall be determined when the site is set out.

3.4.1.6 ACCESS TO RESIDENTS

The Contractor shall ensure that access to residences, businesses and other premises is not compromised and is adequately maintained in cases where access is affected by construction works. If access fall within the construction zone that is demarcated, the Contractor shall ensure that access to the property is maintained by temporarily removing barricades. In cases where bridges are demolished to facilitate construction of drains, sidewalk and parking facilities, the contractor shall provide suitable alternative arrangements to allow access to properties.

3.4.1.7 PUBLIC INFORMATION PLAN

The public shall be informed through selective media of the project, duration and implementation phase (see sample notice, Appendix 1). Road users shall be informed of possible traffic disruption and the importance of exercising caution in order to minimize accidents. Residents living in close proximity to the works shall be informed of the project, the duration of the construction, possible inconveniences and measures that shall be implemented to lessen impacts.

3.4.1.8 COMMUNITY ENGAGEMENT

It is important for the successful contractor to engage all affected stakeholders throughout the construction period to ensure that issues that arise as a result of the works are addressed. Community meetings shall be held periodically as the works progresses. Contact information of staff members shall be provided to

community member to ensure that issues are reported and addressed promptly. See details in the Stakeholders engagement plan and the grievance procedure outlined in the relevant section.

3.4.1.9 TRAFFIC CONTROL

The Traffic Control Plan has been designed for two scenarios.

- Road Works
- Construction Works on a Turn

Mobilization Phase and Construction Phases

During mobilization effective traffic management is essential. Traffic cones and other barriers shall be used to demarcate the area where equipment is working. The contractor shall ensure that two lanes of traffic flow are maintained, this can be achieved by diverting traffic through streets parallel to Sheriff-Mandela where applicable.

Advance warning signs in conformity with the MUTCD manual shall be placed on either side of the approach to warn road users of construction in progress. All warning signs shall be reflective to warn road users who traverse the area at night. The following are the typical signs that are used for construction projects in Guyana. Additional signs based on the type and location of construction activity may be required. The type of signs used should be jointly agreed by the client and consultants and also representatives from the GPF. For this project, traffic arrangement can be approached in a piece–meal manner where plan are developed as the construction activities progresses.

Advance warning signs shall include the following signs:

- *Road Works Ahead*

This sign shall be placed at least 300 m before approaching the construction zone. This shall provide adequate warning to motorist before approaching the site.

- *Speed limit (30 km/h)*

All motorists shall be required to reduce their speed throughout the construction site. This sign shall be placed approximately 200 m before approaching the construction site.

- *Narrow Lane or Diversion Signs*

This sign shall **only** be used when lanes are obstructed. This sign can be placed at least 100 m before approaching the site. Diversion signs indicate location of alternative routes

- *Road Closed Signs.*

Road closed signs/wooden barricades shall only be temporarily used during mobilization if any roadway has to be closed temporarily.

- Detour Signs

Detour sign with the recommended distances and arrow pointing in the direction of the detour location shall be used where necessary.

It is recommended that the construction zone be demarcated from the traffic lane, this is important to ensure the safety of road users. Typically wooden or plastic barriers can be used. Plastic Barriers for this purpose is

often equipped with the necessary reflective material, if wooden barriers are used then they should be painted with and shall encompass the entire construction zone. Road/Lane closed signs or wooden barriers shall be used when a lane is required to be closed to facilitate any works. This shall be only done for short periods to prevent any undue disruption of traffic.

Flagmen with stop and slow signs shall be placed on either side of approach to guide oncoming traffic when necessary (in situations where a lane is closed or if there is significant buildup of traffic). Flagmen shall be placed approximately 30m before approaching the construction site. Flagmen shall use STOP/GO signs to assist in traffic control. Flagmen shall stand behind barriers to ensure safety.

The Contractor shall ensure that the existing carriageway is free of construction debris or any material that can pose a risk to the public. The road shall be wetted regularly if construction activities cause an increase of dust pollution.

The site(s) shall be lit at night to prevent accidents. When night operations are permitted appropriate lighting shall be provided. During the construction phase flashing lights would also be used to demarcate the construction zone in areas where no lights are present. All construction barricades shall be reflective to ensure the safety of road users in the night. Flashing beacons shall be placed at strategic points to ensure that motorists are forewarned of construction works. The traffic police shall be informed and the Contractor shall request police presence on site to assist with traffic management when necessary.

Construction Work on a Turn

The same signs mentioned before can be used.

Sample Notice- See Social Engagement Plan.

3.5 ENVIRONMENTAL RESPONSE PLAN

Despite the best laid plans, there is always the possibility of unforeseen contingencies. The Contractor shall, therefore, prepare and submit to the Supervising Consultant prior to the commencement of construction activities, an Emergency Response Plan (ERP). The ERP will outline protocols for responding to environmental emergencies that may occur as a result of unforeseeable circumstances, such as a spill of hazardous materials. The responsibility for dissemination and informing on this ERP will fall to the EMS.

Any emergency conditions or impacts identified by any person at any time during construction will be handled according to the reporting procedures outlined in this ESMP and the ERP to be prepared by the Contractor.

3.5.1 SPILL CONTINGENCY PLAN

Contained within the ERP will be a Spill Contingency Plan (SCP). In this context, a spill has been designated as any unscheduled discharge of a contaminant to the natural environment that may cause an adverse reaction. In this specific case, a spill may originate from a structure, vehicle or container and include:

- fluid spills into water or onto land from construction equipment; or
- the release of other construction-related materials (asphalt, coating materials, etc.) into water or onto land from vehicles or other sources;

The following outlined procedure should be followed in the event of a spill.

Classification of Spill	***Response***
Solid Material Spill in a Dry Area	*This type of spill shall be treated by the use of protective gears to clean up and recover the material.* *The recovered material shall be stored/transported securely.* *Preventative method and a review of the mode of disposal will be implemented.*
Liquid Material Spill in a Dry Area	*This shall be treated by containing spill using earthen berms.* *Protective gears will be used to clean up and recover the material. Material recovery may utilize pumps or absorbents as appropriate for the type of spill.* *The recovered material shall be stored/transported securely.* *The area will be detoxified.* *Preventative method and a review of the mode of disposal will be implemented.*
Solid Material Spill in an area Wet from Rain	*This shall be treated by covering material with plastic.* *Drainage areas will be Isolated from the spill area, if possible, using earthen berms.* *Downstream users will be notified if appropriate.* *Protective gears will be used to clean up and recover the material.* *The Recovered material shall be stored/transported securely.* *Preventative method and a review of the mode of disposal will be implemented.*
Liquid Material Spill in area Wet from Rain	*This shall be treated by covering material with plastic.* *Drainage areas will be Isolated from the spill area, if possible, using earthen berms.* *Downstream users will be notified if appropriate. Protective gears will be used to clean up and recover the*

	material. *The Recovered material shall be stored/transported securely.* *Preventative method and a review of the mode of disposal will be implemented.*
Solid or Liquid Spill in a Drainage Ditch	*This shall be treated by containing spill using earthen berms across the ditch as far downstream of the spill as possible.* *Drainage areas will be Isolated from the spill area, if possible, using earthen berms.* *The materials will be recovered, if possible, using protective gear.* *An environmental monitoring of downstream water will be implemented as soon as possible.*
DIESEL FUEL	***Initial Spill Response*** *Upon detection of a spill which cannot immediately and safely be contained and removed, notify the Police, Fire Service, Consulting Engineer and MPWC.* *When the Spill is on Land/Water* *Construct berm to contain spill on land* *Pump spill in drums or to storage tanks.* *Apply a quantity of saw dust as an absorbent to the spilled Diesel in proportion to make it workable and transferable.* *The absorbent saw dust shall be burnt at an appropriate site.* ***Spills which have entered the waterways shall undergo the following*** *Block the channel (if practical) with earth, loam or sand to create a waterways barrier.* *If the above is not permissible then floatable containment (made of woven bagasse or rope floated on plastic bottles) shall be utilized and the effluent absorbed by saw- dust or syphoned using a pump.*

BITUMINOUS PRODUCTS	***Initial Spill Response*** *Upon detection of a spill which cannot immediately and safely be contained and removed, notify the Police, Fire Service, the Consulting Engineer and MPWC.* ***WHEN THE SPILL IS ON LAND/WATER*** *Construct berm to contain spill.* *Pump spill in drums or to storage tanks.* *Apply a quantity of saw dust as an absorbent to the spilled Diesel in proportion to make it workable and transferable.* *The absorbent saw dust shall be burnt at an appropriate site on the project.*

Prior to commencement of work, all workers will be trained in the potential emergency response measures and spill reactions. Furthermore, the EMS will pursue a plan of prevention to miminise the possibility of the unforeseen contingencies.

Accordingly, the Plan will outline the fact that operators undertaking interventions involving fuels and lubricants will wear appropriate protective clothing. Operators will be protected through a monitoring and sampling programme for airborne contaminants in confined spaces. The role of a sentry/guard will be clearly defined and will be primarily to act as a passive observer of any fuel handling processes. The sentry/guard will participate in the handling process only in the event of an emergency. This person's role can also be dual, i.e., act as a guard of the facility, to minimise the cost to the project.

These facilities will be constructed before the commencement of the rehabilitation activities. The contractor will be responsible for constructing the impervious bases and containment facilities for fuels and lubricants and for managing the facilities.

Cease Order

The Supervising Consultant and the MPWC may at any time issue a cease order to the Contractor to stop work in the event of an outstanding non-compliance. Except in unusual instances when the environmental consequences of non-compliance are considered by the Environmental Inspector and the MPWC Environmental Engineer to be significant, requiring immediate work stoppage, two warnings from the Supervising Consultant and/or the MPWC Environmental Engineer could constitute sufficient grounds for stopping construction. All incidences of work stoppage will be noted in the Environmental Inspector's inspection report. In the instance of a work stoppage, copies of the inspection report will be submitted by the MPWC to the EPA.

3.5.2 FIRE FIGHTING PROCEDURE.

Several methods of fire control shall be exercised and are as follows:-

1. The use of fire extinguishers located onsite

2. The use of buckets containing white sand.

3. In cases where control is difficulty, then the Guyana Fire Service shall be contacted.

3.5.3 HEALTH AND SAFETY/ACCIDENT EMERGENCY RESPONSE

In cases of any accidental events on site the following response shall be initiated.

- All construction sites shall have First Aid kits. First Aid kits shall contain all necessary materials to deal with small emergency care on site.
- Any accident or emergency situation shall be immediately reported to the Contractor's environmental representative.
- In cases where employees are injured on the site, emergency treatment shall be administered if applicable.
- The employee shall then be transported to the nearest health care facility to receive medical treatment.

3.5.4.1FIRST AID MEASURES

Eye Contact: If toxic liquids (bitumen, kerosene, acids etc.) get into the eyes, it is recommended to flush thoroughly with water using light facial soap. If irritation continues attend a physician.

Skin Contact: Remove contaminated clothing. Dry wipe exposed skin and cleanse yourself with waterless hand cleaner and follow by washing thoroughly with soap and water. For those providing assistance, avoid further contact to yourself or others. Wear impervious gloves. Launder contaminated clothing separately before reuse. Discard contaminated articles that cannot be laundered.

Inhalation: Remove from further exposure. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with mechanical device or use mouth – to – mouth resuscitation.

Ingestion: Seek immediate medical attention. Do not induce vomiting.

3.5.4.1 BURNS CAUSED BY BITUMINOUS PRODUCTS

Burns caused by bituminous products is considered complex because of the different chemicals and interaction with skin tissue.

Additional, the complexity increases with the degree of burn and location on the body.

With an emergency situation, the contractor with the responsibility of workers Health and Safety shall be only responsible to transport the burnt victim to the nearest Doctor/Physician or hospital as quickly as possible. "Burn Cream" shall be applied to give temporary relief until the victim can receive proper medical treatment.

3.5.4.2 SPILL REPORT

PROJECT: Sheriff Street- Mandela Avenue Roadway Expansion Project.

SPILL REPORT

DATE OF SPILL: _____ TIME OF SPILL: _____

LOCATION OF SPILL (chainage): _____ to _____

STAGING AREA (location): _____

Material spilled and estimated quantity:
Cause of spill:
Action taken to terminate and contain the spill
Site clean-up measures taken

Persons notified

ENVIRONMENTAL MANAGER'S SIGNATURE: ……..

3.5.3 ENVIRONMENTAL EMERGENCY RESPONSE CAPACITY

It is generally accepted that there is limited and uncoordinated capacity within Guyana to respond to environmental emergencies. While environmental management falls to the EPA, there is no known legislation that controls such events no specific agency responsible for responding to, and reporting on environmental emergencies. There are a number of ad hoc bodies, such as the Civil Defence Commission (CDC), the National Relief Council (NRC).

Based on information gleaned from the EPA and the Guyana Fire Service (GFS), there is no formal notification and reporting procedure for spills or other large scale environmental emergency events. There is a risk that the emergency response personnel are not adequately trained to control/manage environmental emergencies and have not been provided with adequate equipment. There will be a requirement for early liaison between the above organisations and the Project Team to discuss the local limitations and to ensure that adequate provisions are made to enable effective implementation of the Contractor's emergency preparedness plans.

What would be more essential, would be the development of an effective communication plan in sharing information and coordinating responses. Furthermore, given the limited capacity in Guyana to deal with environmental emergencies, a coordinated approached is likely to have more potential for success.

- *Ministry of Public Works and Communications*

Up to the time of drafting this ESMP the MPWC has no trained staff, equipment, and or clear mandate to provide response to environmental emergencies.

- *Environmental Protection Agency (EPA)*

Though the EPA was called upon to supervise the cyanide spill from the Omai Gold Mines in 1995, the Agency does not have a specific mandate nor the capacity to respond on environmental emergencies. In the past, the Agency has worked closely with the Institute of Applied Science and Technology (IAST) that has some instrumentation to respond to an environmental emergency. However, there is no known emergency response protocol in place and the Agency suffers from a high degree of staff turnover thus limited its human capacity as well.

- *Guyana Police Force and the Guyana Fire Service*

In the event of an emergency the GPF and the GFS will be treated as first responders. While the GPF is trained in keeping law and order, they are not trained to manage spills and in general, Guyana Fire Service officers have limited capability to manage spills. Other fire officers receive basic fire-fighting training on a regular basis (minimum 80 hours per year).

Each fire station is equipped with mobile (pack style) foam applicators to help control chemical/petroleum fires. However, neither the Police nor the Fire Service has equipment to manage spills (e.g., absorbent material and booms).

In the event of a large spill, the Guyana Civil Defence Commission (CDC) would be called upon, but it has no capacity to manage a spill apart from mobilizing resources.

3.6 HEALTH AND SAFETY

The successful contractor should be committed to ensure the safety of the general public and all construction workers and sub-contractors associated with the projects. The Contractor will set up the construction site in such a manner with all signs and barricades in place to ensure the safety of vehicular traffic that traverse through the site. All practical safety measures will be taken to prevent accidents involving construction workers and members of the public. The Contractor will ensure that no material is stockpiled in a manner that will endanger the general public. All traffic lanes will be free of obstruction. All equipment parked on site overnight will be parked away from the open traffic lanes and have reflectors to ensure visibility at night

3.6.1 GENERAL HEALTH AND SAFETY MEASURES THAT SHALL BE IMPLEMENTED BY THE CONTRACTOR

The Contractor shall:

- Designate a person on staff with responsibilities for Occupational Health and Safety.
- Develop and implement Safety Rules for the operation which all employees should comply with and can include the following:
- Appropriate safety equipment and protective clothing should be provided for certain categories of workers as recommended by the Health and Safety Committee or Management.
- Employees are required to wear safety equipment and protective clothing provided by the Contractor in designated areas as and when directed by Management.
- Employees not wearing prescribed safety clothing and associated equipment in an area where the use of such in mandatory shall be required to leave such designated area and shall be subject to disciplinary action.
- Employees shall be expected to take due care of items of safety equipment and protective clothing issued to them
- Employees who abuse safety equipment and protective clothing or fail to comply with instructions or requirements to wear such in designated areas shall be subject to disciplinary action.

Machines are to be operated:

- By competent and authorised personnel.
- Only when safety gears are in position.
- In a manner that does not endanger other employees, the general public or property.
- When the work area is clear and safe.
- Operators are required to wear seat belts in the correct manner when operating machinery fitted with seat belts.
- Operators of heavy duty machinery must be licensed in accordance with the Laws of Guyana.
- Passengers are not permitted on mobile equipment unless they are being trained to operate the machine or are required to ride on it as an unavoidable part of their duties provided it is safe to do so.
- Smoking should absolutely not be permitted anywhere in or near fuel area.
- The Contractors would have the responsibility for the health and safety and well being of all workers and in ensuring that responsibility the Contractors should:
- Provide first aid kits at the site office.
- Provide adequate masks, face shield, gloves, fire proof garments, welding shields and goggles as protective measures as is considered necessary.
- Employees required to work in the rain shall be provided with wet weather gear.
- Overalls and safety helmets shall be provided to employees as is considered necessary.

- In addition to the above undertakings the Contractors should also:
- Ensure that workers are properly oriented to safety and health practices.
- Abide by the guidelines set out in the Occupational Health and Safety Act.
- Ensure workers wear the necessary protective gear at all times.
- Ensure there are trained personnel in First Aid.
- Liaise with health facilities in case of emergencies.
- Provide potable water for employees.
- Ensure garbage and sewage collection and disposal.
- A system should be implemented to detect hazards that may arise. Both the Contractors and the workers have responsibility in this area.
- The employer should:
- 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 any injuries and ensure that those instructions are followed.
- Provide the necessary safety protective gear when required.
- The employee on the other hand has the obligation to:
- Cease work once a hazard is perceived.
- Report the hazards to the supervisor who shall in company with the 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.

Objectives	Workplace Hazard	Suggested PPE
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation	Safety Glasses with side – shields, protective shades, etc.
Head protection	Falling objects, inadequate height clearance, and overhead power cords	Plastic Helmets with top and side impact protection.
Hearing protection	Noise, ultra – sound	Hearing protectors (ear plugs or ear muffs)
Foot protection	Falling or rolling objects, pointed objects. Corrosive or hot liquids.	Safety shoes and boots for protection against moving & falling objects, liquids and chemicals.

Hand protection	Hazardous materials, cuts or laceration, vibrations, extreme temperatures	Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.
Respiratory protection	Dust, fogs, fumes, mists, gases, smokes, vapors	Facemasks with appropriate filter for dust removal and air purification (chemicals, mists, vapors and gases). Single or multi – gas personal monitors, if available.
	Oxygen deficiency	Portable or supplied air (fixed lines). On – site rescue equipment.
Body/leg protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration.	Insulating clothing, body suits, aprons etc. of appropriate materials.

Source: The World Bank Environmental: Health and Safety (EHS) Guidelines.

3.6.2. HEALTH AND SAFETY AND SUB-CONTRACTORS.

All sub-contractors working on the construction site shall be briefed by the engineer and safety control personnel before commencing works on site. The sub-contractor shall be briefed on the requirement of the health and safety plan. Copies of the TCP shall be given to all sub-contractors who shall be required to adhere to all mitigation measures specified. All sub-contractors shall be monitored by the Environmental Inspector to ensure compliance with the TCP. All sub-contractors shall be required to attend a meeting between the Site Engineer and safety control personnel when construction commences.

3.6.3. SAFETY EQUIPMENT

The following safety equipment shall be provided on all sites. A sufficient number of safety equipment shall be provided for all construction workers on site. Spare safety gears shall be present on site for authorized and un-authorized visitors on the site.

1. Safety Vests
2. Helmets
3. Goggles
4. Ear plugs
5. Dust Masks
6. Safety Shoes
7. Gloves
8. Overalls

9. First Aid Kits

10. Fire Extinguisher

11. Emergency Lights.

12. Spill Kits

The spill kit shall comprise the following materials

- Skimmers
- Fire extinguishers
- Absorbent foam
- Gloves, safety goggles and respirators.
- 5 Gallon sealable containers
- Caution Tape
- Bags containing saw dust

All workers shall be required to leave safety equipment on site at the end of the day. Equipment shall be stored in designated boxes in the site office. The environmental inspector shall inspect all safety equipment on a weekly basis to ensure that they are in working order. First Aid Kits, fire extinguisher and Spill kits shall be at hand at all construction sites and be stored in the Contactor's site office. The environmental inspector shall also inspect these items to ensure that necessary components are present. Damaged safety equipment or gears shall be replaced by the contractor. The environmental inspector shall routinely inspect emergency lights to ensure that they are in working order in the event that emergency night works is required.

3.6.4. HEALTH AND SAFETY/ACCIDENT EMERGENCY RESPONSE

In cases of any accidental events on site the following response shall be initiated.

Any accident or emergency situation shall be immediately reported to the Contractor's environmental representative.

In cases where employees are injured on the site, emergency treatment shall be administered if applicable. All Construction sites shall have First Aid kits. First Aid kits shall contain all necessary materials to deal with small emergency care on site.

The employee shall then be transported to the nearest health care facility to receive medical treatment.

Emergency Contact Numbers.

No	Organization	Contact Number
1	Georgetown Public Hospital Cooperation	227-8210-2 227-8204-7227-8241-7
2		
3	Police Headquarters A Division Providence Police Station	255 -3794 ,255 -6940, 226 -0869, 226 - 2487 or 227-4656 265 -7382 or 265 -7383
4	Fire Service.	226-2411- 3, 225-0650-2
5	R.E.O Region # 4	256-3762
6	Contractors (Environmental Officer)	

3.6.5. SAFETY INSPECTION AND REPORTING.

The Contractor's Environmental Inspector shall routinely inspect the construction site and related facilities to ensure that all measures proposed in the TCP are being implemented. All safety equipment shall also be inspected.

Traffic Management issues shall be reported in the weekly inspection report. In the event of an accident a separate accident report shall be filed.

PROJECT: **Sheriff Street- Mandela Avenue Roadway Expansion Project.** **ACCIDENT REPORT –CONSTRUCTION** **Date:** **WEEK OF:**
Description of Incident:
Response Action.
Follow Up.
Environmental Inspector's Signature: **Date:**

4.0 TRAINING AND INDUCTION PLAN

During the construction and operation of the road, emphasis will be placed on providing a safe and healthy environment for the workers. The Contractor will develop a training and induction plan that will be implemented by the Safety Officer. The Safety Officer will be required to conduct site health and safety inductions for all staff within the project. At a minimum, all workers will receive practical and theoretical training on response measures to emergencies, protocols to be followed during working hours, methods for waste disposal and waste management and issues related to environmental protection generally.

A health and safety plan will be developed and implemented to ensure compliance with the regulations of the Occupational Health and Safety (OHS) Act 1997. Occupational Safety and Health plans will be implemented in the following areas:

- Industrial Accident prevention and management,
- Occupational Hygiene,
- Illness and Infectious disease prevention and management, and
- Sewage and Waste Disposal.

All work and camp sites will be provided with adequate compound and satellite site welfare facilities. The main environmental occupational hazards to which employees will be exposed during the rehabilitation/construction and operation of the project are:

- waterborne diseases; - leptospirosis transmitted through from rat urine.
- Dust,
- Noise,
- Heat, and
- Fumes.

Hygiene

The Contractor will provide and maintain an adequate supply of water and sanitation, refuse collection and disposal facilities, complying with all applicable laws and by-laws at all sites and staging areas. He will also provide proper hygiene conditions, such as disinfectants, hand washing liquid, and the use of glove for workers where appropriate.

Further, adequate welfare facilities are to be included at the camp site and intermittently along the route e.g. washrooms and places to shelter from extreme weather conditions such as heat and rainfall and adequate places to take comfort and lunch breaks.

Dust Exposure

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

The Contractor will provide dust respirator with filters to employees exposed during the excavation of construction material at his own cost. Workers will be monitored by the EMS.

The Contractor, based on approval from the Supervising Consultant, will site living quarters at a convenient distance from the operations site and on the leeward side of same,

These measures will assist in elimination or reduction in the very low risk of the development of lung impregnated disease by employees exposed to dust.

Workers in the excavation and transportation phases of the operations would be exposed to wind blown/fugitive dust being blown into the eyes and causing eye irritation and conjunctivitis. These employees will be provided with clear goggles by the Contractor and eye wash lotion will at all times be available for washing the affected eyes. The EMS will pay discretionary visits to ensure the protective equipment are being used, and used in the correct fashion. Additionally, it will be the responsibility of the Site Engineer to ensure that workers comply with the requisite OSH stipulations.

Noise

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

- Control of noise levels at source via installation of silencers on exhaust system of standby generators.
- The Contractor shall provide hearing protection to employees exposed to high noise levels: ear muffs for employees in the maintenance shops, working with heavy equipment, and standby generator areas.
- The Contractor shall provide earplugs for employees who operate heavy-duty machines.
- The standby generator will be sited in locations away from the living quarters of employees. These locations will have to be approved by the Supervising Consultant.
- Warning signs in areas of high noise levels instructing employees to wear earmuffs or earplugs as required.

Further, the Contractor will pursue hearing conservation programme for employees exposed to noise. This will consist of:

- Audiological examination before employment for those workers in the most sensitive areas, i.e., working with hazardous material, to establish baseline hearing capacity on initiation of employment.
- Six monthly audiological testing of employees exposed to high noise levels.
- Acquisition of a portable sound level meter.
- Measurement of sound levels in instances where it is suspected that deviations from the previous levels are occurring.

Heat

- Measures to decrease the effect of increased exposure to heat will include:
- Measurement of ambient temperature levels in vicinity of generating plant, and
- Workers regulating the flow of traffic will be provided with adequate head gear and umbrellas during the sunny weather, as well as raincoats for the rainy season.
- Implementation of the management programme for health and safety of employees will coincide with the commencement of construction activities and will last throughout work on project closure. The contractor and the PMU will be mainly responsible for its implementation.

5.0 SOCIAL ENGAGMENT PLAN

Roles and Responsibilities

EA – supervises and is accountable to the national community for the successful completion of the project. This agency will take the lead in the communications process back to its many stakeholders, ensuring that maximum use is made of all the agencies through which information is to be communicated.

ESS – part of the EA, this person will liaise with all of the key players to ensure that all components of the communications, information and engagement process are working smoothly. Under her watch, access to a website should be made available to the Road Users Group/ Multi Stakeholder Committee for storing all updates on MSC activities. Polling of public opinion will not be conducted online or stored on this website but will be managed independent of the MPWC&C.

EM – Contractor point person for all environment and social engagement matters; to work closely with Project Environment Officer; to supervise all contractor obligations tabled under the As manager, he/she is expected to have a team comprising point persons for health and safety; traffic management; drainage, to name a few.

PCLO – attached to the Supervisory Agency, this person will be positioned to answer the concerns of stakeholders in matters large and small. His or her role will be to address all grievances or concerns in a timely manner, working closely with the contractor's Environmental Specialist; furnishing credible answers on requests for assistance; managing the recording and distribution of minutes arising out of Road Users Group (RUG) meetings. This role includes the responsibility for supervising the communications efforts of contractors, providing them with the placement of print and electronic material where necessary. The PCLO will also conduct a monthly telephone poll of random stakeholder opinion along the corridor, recording feedback and flagging its results to the EA; RUG and Resident Engineer where relevant.

Admin Support – will assist the PCLO in monitoring requests for information; will support and track the turnaround time of the Supervisory firm's PCLO in addressing stakeholder concerns; the number and nature of grievances lodged and the steps taken to redress them; will monitor and flag media commentary about the project. He/she will work closely with all contractors and the PCLO to maintain a consistent Grievance Log/database throughout the life of the project, managing the 24-hour Hotline and referring all concerns logged to the PCLO.

Communications Vehicles

Public Road User Group/MSC Meetings

Stakeholder satisfaction is often an elusive target. It is more readily achieved however by taking every opportunity for enquiry and feedback. Two key strategies involve the hosting of issue management meetings in which stakeholders are invited to participate. As such, this document goes one step beyond the predecessor SRP recommendation of multi-stakeholder meetings to suggest that these be held in a consistent time and location to which the general public has ready access. These meetings will be chaired by the Consultant Social Specialist who will lead all participants through a participatory approach to problem solving. Fifteen stakeholders critical to the execution of the roadway- among them 5 resident representatives from along the corridor – will engage in roundtable discussion of the issues addressed in the Stakeholder Matrix. The wider audience is free to comment and/or seek clarity in ways that do not detract from the productive output of the meeting.

The Project Community Liaison Officer attached to the Supervisory Engineer's firm will record the minutes and contribute to sharing relevant, accurate information about the project as requested. Any significant milestones achieved should be aired in the press as a quarterly advertorial entitled: *Eye on Sheriff/Mandela*. The transparent, participatory nature of this approach will act as a safeguard against the notion that there is anything less than above board about this project. It will also provide an avenue for public accountability, forcing all participants to raise the bar on the quality of contribution they make at each roundtable meeting.

Grievance Mechanism

A 24-hour telephone Hotline; written correspondence; a visit to the construction site or the office of the Supervisory firm are but a few ways in which grievances – those matters of perceived aggravation for which stakeholders seek redress – may be recorded and tabled for follow up. Complainants may opt for the more confidential route of an anonymous phone call even as care should be taken even by those willing to be identified, to have their privacy protected nonetheless.

Each complaint should be formally logged by the Information Unit at the supervisory firm with feedback to the complainant who within 14 days must be advised in writing via email or registered mail of the status of the attempts at resolution up to that time. In matters where the complainant desires total anonymity, a telephone call should be the PCLO's last resort in terms of feedback but that too should be logged in a follow up contact report. The complaint is weighed for its level of risk to the project and filed for immediate intervention and later audit. Failing this, the complainant is free to take the matter up with the Works and Services Group more directly, holding the Information Officer to strict accountability for the quality and speed of response.

Contractor Obligations

An Open House will be held at the site - which is readily identified by large billboard/signage - as soon as Traffic and Water Management Plans have been approved by the Supervisory Firm. Stakeholders will be formally invited by press release; press notices; fliers and mobile announcements. Contractors are obliged to have a technical team ready to address the concerns of attendees. PCLO and Stakeholder Consultant will capture concerns and update Matrix.

Contractor or his representative will attend all MSC/Road User Group meetings and all Crisis Committee meetings.

Another Open House will be hosted midway or at the end of the project at contractor's discretion.

Opinion Poll

A monthly random sample telephone poll of 20 stakeholders should be conducted along the length of the corridor from project inception to delivery. Care should be taken to avoid recording names. Instead, stakeholders' responses should be logged by geographical area and age only. Two questions should be polled: 1) "How do you feel about the current effort to improve the roadway?" and 2) "How can we do better?"

Public Education Programme

New road; new moves…get with the programme…!

Rationale

Commuters and pedestrians along the Sheriff Street-Mandela Avenue corridor for whom this upgrade and expansion are intended, are indeed varied in the extent of their road use. Their shared concerns however are about road quality; accessible parking; ease of access to other streets; timely delivery of a new road and for a specific distance at least - an end to traffic congestion. Approximately two years since this project was first

signalled to the commuting public, WSG finds itself challenged by the need to attempt to match behaviour change to new infrastructure – admittedly no easy task.

This corridor is an exceedingly popular one and along with their measured approval of its planned expansion, stakeholders have expressed the fear that a new road will simply exacerbate already poor road use by pedestrian and driver alike. Thus it is that a public education programme must aim at consensus around different behaviour on the road. Road users must be encouraged in the use of a new 7km long roadway which will afford them a newfound measure of safety with good lighting; signage and pedestrian friendly design, among others. This brief document contains a few proposed measures to secure the approval and desired cooperation of road users and a wider audience of intermittent ones - their irritation at such initial inconvenience, notwithstanding.

This attempt at public education will focus on an awareness of: *New road; new moves - get with the programme…!* Every attempt should be made to encourage a new code of behaviour by singling out errant drivers and pedestrians as locked in the past. Positive comparisons should be made between old moves and the new moves required by the new road for safe use and improved quality of life.

Target Audiences

- Private vehicle drivers and passengers
- Drivers of vehicles for hire and passengers
- Pedestrians
- Commuters to East bank and East Coast access points
- Roadside vendors
- Motor cyclists
- Electronic and print media

Media Strategy

Every attempt should be made to contact the national stakeholder audience consistently As such, a three (3)-week burst of information on the Sheriff Street/ Mandela upgrade and expansion is recommended followed by two (2)-week bursts of information bi-monthly for three months. Budget permitting, this approach may be extended throughout the life of the project at critical intervals.

Vehicles

<u>Press Conference</u>

Theme: *New road; new moves – let's get with the programme…!*

The EA must be seen to keep faith with its primary stakeholders – the wider national audience of Guyana. As such, a technical team made up of 3 representatives of the EA; 2 members of the Design Team and the EA's consultant Social Specialist should allow the media to question them on the project after a brief summary of the history and direction of the project by the EA lead. Prior role play for the team, as a team, is suggested on how to remain centred in the face of challenging questions. A supporting press release should be placed by GINA summarizing the event.

<u>Press Ads</u>

These will take the form of a monthly advertorial to all users of the corridor on what to exist as the project unfolds. A black and white (b/w) full-page press ad should be placed in the 4 existing dailies for 3 consecutive Sundays one month before construction begins. The 2-week information bursts which follow intermittently will feature a smaller press ad of 25cmx5cols to be published on Wednesdays only with the title: *Eye on Sheriff-*

Mandela. These monthly updates can feature short stories of persons who are ready to embrace the: *New road; new moves* that the completed roadway will require in the near future.

Television

Copies of a prepared press release will be placed on as wide a selection of stations for maximum outreach during or immediately before newscasts. Recorded television spots (as per sample) will appeal to those who wish to be thought of as ready for anything…full of new moves…ready for the new road.

Radio

Press releases may be used for paid announcer-read spots or as source material for newscasts. Dramatized spots (sample included earlier) will reinforce the: *New road; new moves…get with the programme* campaign.

Creative Content

Sample, 20-second TV spot follows…

SFX: Strident sound of car horns

Voice #1: Like he gon kill we on this road or wha?

SFX: Tires screech with a long bang…

Voice #2: Not me! Guh lang….Something better coming...!

Brand new bus pulls up with smiling conductor who ushers them in with a polite wave of his hand (gestures exaggerated).

Anncr's voice*: New road; new moves - get with the programme….!*

Sample Radio Spot follows…

Voice #1(male): "You see dat? Allyuh see dat?"

Voice #2: "See wha, Bannas?"

Voice #2: "Two cars stop to let 5 children cross – 5 - and not a man vex!"

Voice # 1: "Ting changing; like it changing fuh real…"

Anncr's voice: *New road; new moves – get with the programme!*

Knowledge Fair

In the interim period between road design and actual construction, stakeholders along the corridor will be invited to the National Park to learn about road upgrade and expansion – and their role in it. This public education programme in behaviour change will have a fun component where participants will be able to view 3D images of the road design and ask questions pertaining to their stretch of the road – particularly around issues of traffic management and implications for wider access to adjacent streets.

Road Safety demonstrations will allow for participation by onlookers. Samples of signage will be displayed and stakeholders invited to identify them for a prize. Dee jays will play themed music around national pride: "I am a Guyanese" while creating excitement about the upcoming road: Caribbean entertainer, Bunji Garlin's "We ready for the road…!" among others (including the possibility of his band's live performance at the Fair).

Food vendors will be allowed to ply their trade. Car dealers might be approached to have new vehicles on display. Role playing on a mock stretch of 'road' with participants acting as pedestrians wanting to cross; busy taxi driver approaching and so on, are all tools in driving home the point that the time has come for new road behaviour: *New road; new moves – get with the programme….!*

Public Education Programme Budget

To be allocated by the EA; rule of thumb for an undertaking of this nature is: **.25% of total project costs.**

1.7 **SEP Activities EARLY INCEPTION**

Item	Budget(US)	When	Who	How	Output
Stakeholder Recall Meetings (2); same venue; different dates; MSC members sought	$3,000. Ads: 600; Refreshment: 600; Mike: 200; Fliers: 300; Mail: 250; Transcription: 500.	**May 13/14/15**	EA's SS (VR)	Letter sent by EA to all of the previous stakeholders (Please see list)	Updated Matrix; findings sent to road design firm
Public Education programme begins: Press Conference: *New Road. New Moves –Get with the Programme!*	TBD	**June** **Week 2**	EA	Formal interface with media; Panel: WSG: SS EXP;CEMCO;	Press releases; media commentary; clippings filed
Formal presentations in 5 communities; Resident volunteers sought for MSC	$1000. Fliers; loudspeaker announcements; Press notices of meetings	**June Weeks 2,3,4**	Exp makes formal presentation; EA Stakeholder Specialist to arrange	Held in schools or community centres; road design shown	Feedback to impact road design where possible

Item	Budget(US)	When	Who	How	Output
Focus group meetings with informal sector –special interests - roadside vendors; owners of carts; PTA etc.	$500.	**July Weeks 3,4,5**	EA Stakeholder Specialist to arrange	School hall; late afternoons	Feedback on concerns addressed on the spot by design team
15-member MSC/ Road Users Group Members identified and invited to SEP Orientation session along with contractor pool; EA staff; road design team; utility companies	$1500. Refreshments-500; hall and mike rental-700; rapporteur – 300.	**August Week 1**	Team Social Engagement Consultant to lead process; EA Stakeholder Specialist to co-facilitate	To be determined by EA Stakeholder Specialist	Registration forms; minutes of meeting
Public Education Programme continues	EA	**September**	Media Release for print and electronic news – Road Design approved after careful consultation	EA	Samples of published press releases
PRE –CONSTRUCTION					
EA Tender process for road construction begins	EA	September to December	Press Ad – Invitation to Tender; Media Release to announce award of contract and date of start up	EA	Tender Bid documents
MSC/Road Users Group Orientation Meeting; first of quarterly sessions closed to public; to progress to monthly open meetings as project unfolds	$600.. Hall – 500 Refreshments -100; recording secretary	September Week 1	Social engagement Consultant/EA Stakeholder Specialist to co-facilitate; rapporteur	EA Stakeholder Specialist to arrange	Meeting Minutes
Public Education	EA	January	EA to allocate resources;	Radio and television	Focus of public comment;

Item	Budget(US)	When	Who	How	Output
Programme ramps up (Sample plan attached)		Week 3 –road completion 2015 in periodic bursts of advertising	suggested closer ties between ESS and PCLO	spots; press releases; notices; advertorial: *Eye on Sheriff/Mandela*	unpaid media coverage; ad samples filed
Contractor mobilisation of resources; holds Open House at start and one at end; billboard erected on site; stakeholder concerns addressed through MSC	6000	January to June 2014		PCLO to support; MSC to attend Contractor Open House	Super. Firm's Reports reflect Contractor Endorsement of MSC support
MSC meetings right up to end of construction period; informed by PCLO Grievance Report report.		January 2014; quarterly meeting in March; thereafter to meet each month. This period is expected to be long and hectic	MSC Road Users Group; ESS; PCLO	Open door session at Cultural Centre, same date, same time to be agreed upon by members; large table with chairs; extra chairs for audience; water cooler	Minutes of Meeting, written periodic unannounced evaluation by IDB steering committee of gate-keepers
CONSTRUCTION					
Crisis Committee of 8 members; operates intermittently but reports findings to MSC		As needed for any major crises – oil spills; explosions; serious injury etc.		Consisting only of persons critical to project operations; Res Eng to call at a moment's notice; member; contractors' ESS; Safety Officers; PCLO; WSG;	Disaster/Incident Report Findings sent in writing to MSC/RUG
Public Education continues; Radio and tv ads prevail on	EA	Midway through construction period		EA; Supervisory Firm; Contractors; PCLO – A	Polls conducted each month refer to perceived changes in

Item	Budget(US)	When	Who	How	Output
users of the road to adopt: *New Moves* – different road use behavior		– Knowledge Fair		team effort which EA leads	people's behaviour;;
Public Education programme allows for press conferences; press updates as needed. Radio spots may be complimented by radio call in programmes.to test the 'pulse' of the stakeholder. Schools engaged in poster competitions on theme etc.	EA	Ongoing in intervals until the road is completed.		EA	
Road constructed; evaluation period; MSC final report tendered; Crisis Committee Report tendered;	EA	Ends in MSC/EA joint Press Conference; formal road opening ceremony. Budget permitting, public education programme should evolve into award mechanisms for new moves on the road….		EA	Consider: *Hero on the Road* – good road behavior highlighted; *New Move to Safety*: Road users share their new behaviours on radio call-in programmes

Lessons Learned

The East Bank 4-Lane experience has provided invaluable guidance on what is critical to social engagement effectiveness. These lessons are as follow:

Ownership by the EA of the stakeholder engagement process that allows for consistent functioning of the Multi-Stakeholder Committee

Ongoing support of contractor efforts at communicating with the public. Such communication should be consistent but not onerous for the contractor. PCLO Unit should work closely with executing arm of contractor

The MSC needs to be seen to be working. Its meetings therefore should be held in the public domain with updates on its performance lodged as statements in the press.

The Grievance Process should be implemented as laid out in the Mangal Report of 2011 as it will prove invaluable as a safeguard against negative claims and possible inaction on the part of the contractor. A Log Book or database of Grievance Reports must be available on request for tracking purposes by the IDB, EA, Supervisory Firm or contractor company. This may be updated on a monthly basis while Risk Assessment Sheets are shared by all on the Project team, contractors included, as necessary. Concerns need to be logged according to the level of risk and point persons triggered for specific tasks. The PCLO is expected to manage the flow of information around this process but the responsibility for incident intervention should reside with the Supervisory Firm and contractor technical teams.

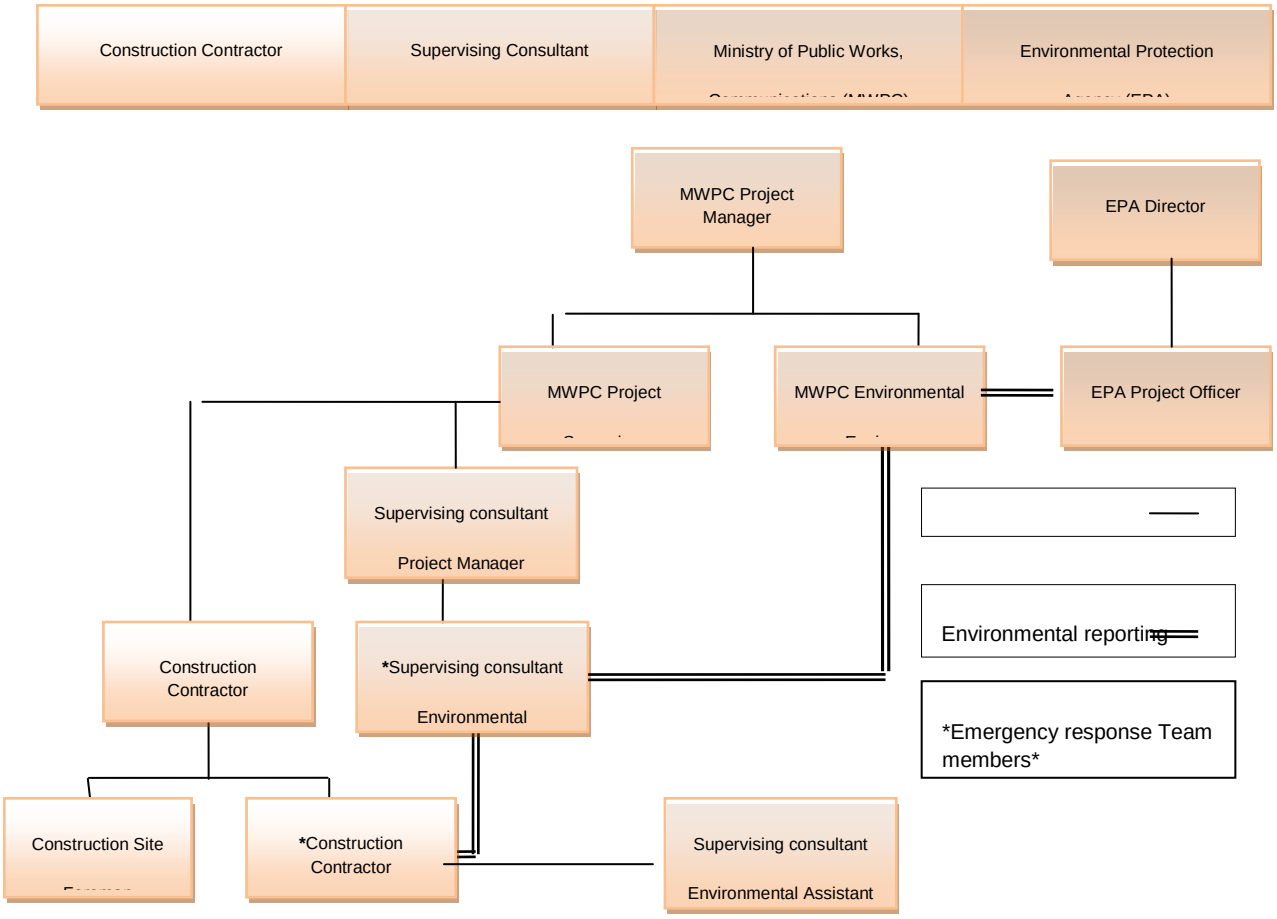
Extra vigilance is required of the Supervisory Firm's Environmental Manager/Unit to ensure that contractors submit their traffic plans as priority for sharing with communities during ongoing stakeholder meetings.

6.0 AN OVERVIEW OF ROLES AND RESPONSIBILITIES

This section of the ESMP outlines the process for monitoring the implementation of the ESMP. It also identifies what will be monitored. Furthermore, it describes monitoring measures both for the responsible agencies in the MPW&C and for other sectoral agencies with responsibility for environmental management in Guyana. The plan also takes into account likely changes to current institutional arrangements and outlines institutional linkages within and outside the relevant agencies.

6.1 GENERAL ROLES AND RESPONSIBILITIES

The organogram and Table below outline the administration roles and responsibilities of the client and its representatives, the regulatory agencies, and the Contractor in the preparation and detailing of protocols to be followed during the preconstruction, construction and operational phases of the project. Many of these protocols will be done in consultation with other stakeholders, such as the NDC, NDIA and residents.



6.2 KEY ROLE AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT OF THE PROJECT

MPW Project Manager	**Overall Management of the Project and main liaison with GoG and IDB.**
MPW Project Supervisor	**Oversee project and meet regularly with key members of the Supervising Consultant and his team and the Contractor's Project Management team and provide feedback to the MPWC Project Manager as required formally and as necessary.** **Attend public consultation meetings as required.**
MPW Environmental Engineer	**Overseeing that the overall implementation of the ESMP.** **Undertake regular inspections on a discretionary basis of all areas of the works, site offices, compound, storage of materials areas and general provisions for environmental management during pre-construction and construction activities.** **Conduct reviews to ensure reporting and monitoring systems are in place and being maintained and recorded appropriately.** **Recording any incidents that require corrective actions which could be recorded as non-compliance. If the action is not corrected within the dedicated timeframe, the EE will write the Contractor on this formally.** **Attend regular meetings with other environmental representatives from Contractor and Consulting organisations.** **Attend regular project management meetings.**
Supervising Consultant Project Manager	**Maintain administrative overview and design, review and monitor inspection reports and identify actions to Contractor.**
Consulting Engineer Environmental Management Specialist (Inspector)	**Audit the Principal Contractor's Construction Environmental Management Plan and activities associated with strategic plans and method statements and compliance with the Contract Specification, local regulations and the ESMP.** **Maintain inspection reports.**

	Provide weekly reports to the Supervising Consultant Manager **Hold regular meetings with the Contractor's Environmental Inspector, MPWC Environmental representative and others as required.** **Ensure compliance and performance monitoring of the ESMP are conducted as stipulated in the ESMP.** **Monitor compliance with the engagement of the public in accordance with the Communication Plan.** **Attend Multi-Stakeholder Road Committee meetings as required.**
Construction Contractor Project Manager	**Contractor responsible for compliance with Quality Environment and Safety, and the full implementation of the ESMP.** **Attend Multi-Stakeholder Road Committee meetings as required.**
Contractor's Environmental Manager	**Reports to Contractor's Project Manager, the Supervising Consultant Environmental Management Specialist and the Supervising Consultant's Engineer Project Manager.** **Regular daily site inspections of all work areas and reporting as required for corrective actions.** **Training new team members on any environmental aspects and specific tool box talks for site specific activities e.g. occupational health and safety, etc.** **Coordinate all environmental quality testing as required by the ESMP.** **Provide monthly reports to the Project Manager which will include training and induction records; incident reports and reports /complaints by the public inclusive confirmation of actions taken.** **Maintain waste management records – materials and domestic waste management.** **Implement with the Contractor's site team adherence to the strategic plans - Traffic Management Plan, Communication Plan, Emergency Response Protocols and general environmental best practice.** **Prepare site specific or standard generic methods for the site team to adhere to for working near watercourses.** **Implement the ESMP in full.**
Construction Site Foreman and Site Supervision team	**Undertake regular daily site visits to ensure all site personnel are site inducted for Occupational Health and Safety as well as environmental awareness and responsibilities to report and act in the event of ANY environmental incident;** **Undertake regular inspection of machinery and equipment to reduce any leaks, spills and to take corrective action as needed.**

	Log any incidents and report to Contractor's Environmental Manager following spills. **Ensure installation of protection measures and regular maintenance prior to any works commencing e.g. silt barriers, protective fencing to limit public access into any active works area.** **Follow reporting protocol in the event of an emergency or unforeseen issue e.g. exposure of any unknown utilities or pipes to Contractor's Environmental Manager.**

7.0 ENVIRONMENTAL MONITORING PLAN

7.1 INTRODUCTION

This section of the ESMP outlines the process for monitoring the implementation of the ESMP. It also identifies what will be monitored. Furthermore, it describes monitoring measures both for the responsible agencies in the MPW&C and for other sectoral agencies with responsibility for environmental management in Guyana. The plan also takes into account likely changes to current institutional arrangements and outlines institutional linkages within and outside the relevant agencies.

For each activity, the monitoring plan identifies appropriate institutions for implementation and provides approximate costs, which have been validated based on information obtained from those who will have to implement these monitoring regimes. The cost estimates are derived from an understanding by the consultant of what will be required and the costs estimates for such services nationally.

The Contractor's EMS will be responsible for refinement of the monitoring plan and the implementation of this plan. Regular reports will be provided to the Supervising Consultant on the monitoring of the various parameters. At the same time, it will be necessary that attention must be paid to the implementation of the monitoring package in terms of timing and the correct application of the measures. Each measure will help mitigate a potential problem. However, the full benefits of the package will not be realized if some measures are not implemented. It is, therefore, very significant that the recommended mitigation measures be applied and/or pursued in their entirety before and during the rehabilitation and operational phases.

7.2 ENVIRONMENTAL MONITORING

The ESMP outlines two basic monitoring regimes that will be followed and be overseen by the Contractor's EMS. These are: (i) environmental compliance monitoring (ECM), and (ii) environmental effects/performance monitoring. Environmental Compliance Monitoring (ECM) focuses on physical investment that has to be carried out in accordance with relevant clauses in the contract documents, and the MPW&C and IADB regulations. Environmental Compliance Monitoring is the process of checking that agreed actions have been carried out effectively, in the right place and at the right time. They are described in project sequences. It should be noted that rather than carrying out site inspections with agency staff, the EPA encourages self-monitoring by project proponents; with monitoring reports being submitted to the EPA for review.

The second component, Environmental Performance Monitoring (EPM) is the process of checking the impacts of the project on specific social or environmental parameters or features (e.g. "valued ecosystem components" such as wetlands). This is normally done through the measurement of one or more indicators. The EMS will be responsible for the implementation of this EPM where, if the value of the indicator exceeds a certain legal level, or if it is changing too fast in comparison with a pre-project baseline value, then further investigation will be carried out to determine an appropriate management response. The following areas of effects monitoring are considered most relevant to this project: socio-economic, health, soil, surface and sub-surface water quality, and plant and aquatic life along the road corridor and surrounding areas. The primary water and soil quality monitoring programme will be implemented under an arrangement between the MPW&C, EPA, and the Contractor. The objectives of this monitoring programme are to provide the project management team with the information required to evaluate the success or failure of the project from an environmental and

social standpoint and determine if subsequent interventions would be required. The EMS will be carry out and/or coordinate the monitoring programme to be executed.

The ESIR for the project has demonstrated the importance of sound planning, high standard of project implementation and on-going management in promoting the continued successful implementation of the Sheriff Street – Mandela Avenue Road Project. Steps can be taken to help correct problems such as traffic congestion along the road corridor, improve road safety, solid waste management and surface water contamination by road rehabilitation works.

The following sections set out a menu of measures to mitigate the direct and indirect negative impacts of the project and to help establish a sounder base for future development. These measures have been selected based upon their technical feasibility, economic viability, socio-cultural palatability and environmental sustainability. Furthermore, the institutional capacity necessary to implement these measures is also briefly examined.

The ESMP model is built on the structure that management depends on measurement. Without measurement, management has nothing on which to base its decisions. The ESMP will have two components:

Activities within the PMU which will support the monitoring programme; and

Activities within the PMU, EMS, EPA and other sector bodies that will monitor water quality, soil contamination, and air quality.

The Contractor's Project Manager, supported by the EMS will be responsible for monitoring the performance of all project activities. This will be done through a coordinated programme that starts with a baseline survey and then continues through the life of the project.

7.3 INSTITUTIONAL REQUIREMENT FOR ENVIRONMENTAL MONITORING PROGRAMME

In order to establish a proper framework for environmental and social management and monitoring, a well structured institutional arrangement needs to be identified. The principal stakeholder for environmental management will include the MPW&C, EPA, PMU, the EMS, and the Contractor. The IADB will conduct review and supervision missions. The division of work and suggested responsibility are presented in the Table below:

Table : Compliance Monitoring Framework	
Organisation	**Tasks**
MPW	As the project proponent, obtain environmental clearance from the EPA. Ensure that the supervision mechanism for the physical works includes resources to ensure enforcement of compliance with the environmental and health and safety provisions of the contracts. Prepare regular monitoring reports and forward these to the EPA and IADB.
Contractor's Project Management Unit (PMU)	Working under the direction of the MPW&C the PMU will perform the following tasks: Support EMS to develop an environmental monitoring operational plan. Coordinate with relevant private and public sector entities and non-governmental organizations (NGOs) to mitigate the key environmental problems that may arise during project implementation. Maintain and manage project reports. Report Environmental Monitoring results into project progress report and submit to the MPW&C.
EMS	The National Environmental Management Specialist (EMS) will be contracted by the PMU for the duration of the rehabilitation period and will assist with on site supervision of environmental assessment and biological control measures within the ADEI, especially in schools, workers camp, training of WSG staff members to continue the monitoring work during the operational phase of the project, coordinate local environmental inspectors in environmental monitoring and taking samplings
WSG/EPA/IAST/GFDD	The WSG, in collaboration with the Environmental Protection Agency (EPA), Institute of Applied Science and Technology (IAST) and the Government Food and Drug Department (GFDD) will set up a programme to periodically monitor key environmental parameters with the PMU. The reports from this collaboration will include: An assessment on the changes in water and air quality, changes in water use and changes in soil contamination. This may include baseline survey and subsequent periodic monitoring. Reporting on the extent and severity of the environmental impacts against the predicted impacts in the ESIA and ESMP. An assessment on the overall effectiveness of the project in environmental mitigation and monitoring measures.

	Provide training in geographic information systems (GIS) and geographic positioning system (GPS) technologies for sample collection and information on sample sites.
2. EPA	As the regulatory authority, administers the environmental assessment process and issues the project's Environmental Permit. Reviews monitoring reports from the project proponent and ensures compliance with Permit conditions.
3. IADB	Ensures compliance of the project design with IADB environmental and social procedures and guidelines. Reviews monitoring reports and carries out supervisory missions to ensure compliance with loan conditionality.
4. Supervising Consultant	Supervise the work of the contractor(s) and ensures compliance of the works with the environmental and health, safety and welfare specifications and conditions in the contract documents.
5. Contractor	Carry out his/her work in conformity with the Contractor's Guidelines and specifications in his/her contract for design, construction and operation of the project and environmental mitigation.

Source: Compiled by Consultant

The monitoring system should be workable and manageable; there is a need for an efficient and Workable Reporting System for the Monitoring to be effective. This has to be initiated by the Contractor within the PMU.

Table details the water parameters under this project. These parameters have been gleaned from the ESIR.

Table : Indicators and Parameters for Monitoring Surface and Ground Waters

Indicators	Parameters
Physical Properties:	**Temperature** **Odour** **Turbidity** **TSS** **TDS** **pH** **Hardness**

Chemical Properties:	**Iron**
	Manganese
	Calcium
	Carbonate
	Ammonia
	Nitrate
	Nitrite
	Sulphate
	Phosphate
	Organic Matter
	Salinity
	DO
	COD
	BOD
	Other Pollutants

Source: Compiled from the ESIR (December 2010)

The EMS will monitor the implementation of mitigation measures and the impacts of the project during the rehabilitation and operation phases. In the plan, there will be an estimate of capital and operating costs and description of other inputs (such as training and institutional strengthening) that are needed to carry out the Project as detailed in Tables 4.3 & 4.4.

Table : Compliance Management and Monitoring

Phase	Activity	Responsible Entity	Task	Budget (US$ '000)	Source of Funding
Pre-Construction					
	Environmental Management and Monitoring Programme. Detailed Monitoring describing Contractors Social & Technical Responsibility	MPW	Collect "baseline data" on a selected number of biological, social and economic indicators reflecting environmental sensitivity and that will be moderately or significantly affected due to the project.	$300,000	IADB and GoG
Construction					
	Construction of work camp(s)	Contractor with supervision from EMS	Monitor and track siting process	-	Contractors budget
	Operation of camp(s)	Contractor working in compliance with contractual conditions relating to health, food, sanitation, and waste management	Monitor health and labour force, camp site environs	-	Contractors budget

	Impact on the labour force	Contractor with supervision from the PMU.	Monitor employment and cash flow in local communities; reactions of surrounding areas to the project and work force.	25,000	Project funds and done as part of the Project Evaluation
	Impact on businesses	PMU in collaboration with the Private Sector Commission (PSC)	Monitor businesses turnover, growth or lack thereof, and profitability over the rehabilitation phase of the project	25,000	IADB and the GoG
	Traffic Management	Contractor with assistance from the Guyana Police Force (GPF) and under supervision from the EMS	Monitor accident statistics, traffic speeds, routing, pace at which traffic flows, etc	-	Contractors budget

Impact	Activity	Responsible Entity	Task	Budget (US$ '000)	Source of Funding
Construction cont'd					
	Monitor atmospheric, water and biological parameters during site preparation	Contractor, EMS and the Environmental Inspector	Compliance with contractual conditions on atmospheric, water and biological parameters. Audit against the Contractor's contractual obligations	100,000	IADB and GoG
	Monitoring water quality in streams and the level of erosion and sedimentation during rehabilitation	EPA , MPW & C, EMS	Compliance with technical specifications for earthworks and spoil disposal, especially erosion control and drainage, and for protection of watercourses	50,000	IADB and GoG
	Area of land taken and re-vegetation of Borrow pits and quarries	Contractor, EMS & Environmental Inspector	Monitor the siting, operation and closure of pits and quarries	20,000	IADB and GoG
Operational					
	Maintain the road	GOG/MPW & C	Compliance with environmental/social	Not Known	GoG

			conditions governing the maintenance of the road		
	Traffic management	GPF	Monitor the flow of traffic as well as accident and injury statistics	Not Known	GoG
	Maintenance camps and Demobilization of Camps	Contractors & EMS	Vegetation and streams around camps, settlement around camps, relations with local communities	Not Known	GoG
	Drainage canals maintenance	MPW&C and Mayor and City Council (M&CC)	Monitor the flow patterns and rate of flow.	Not Known	GoG & M&CC

Source: Compiled by the Consultant

Table : Effects/Performance Monitoring Plan

Parameters to be Monitored	Periodicity	Number of Samples				Cost for one Year in US$	Total Cost in US$ for 2 Years
		Total Number of Samples	Number of Indicators	Sum of Determination	Total/ yr		
Potential Soil Toxicity	Once per year for 2 years	5	3	15	15	15	$450.00
Surface Water measurement	Twice yearly for 2 years	5	5	25	25	25	$1,250.00
Ground Water Quality	Twice annually for 2 years	5	5	25	25	25	$1,250.00
Surface Water Quality	Twice annually for 2 years	5	10	50	50	25	$2,500.00
Reforestation	Onetime Expense	Along road Corridor	$200 per Km		$1,000	-	$1,000.00
Equipment for WSG	Onetime purchase of 5 hand held GPS	5	$500.0		2,500.0 US$	$2,500	$2,500.00

	units, computer download.				GPS units		
Training on GPS operation and Sampling.	Onetime 1 month training					$10,000.0	$10,000.00
Solid Waste Collection & Management, provision of garbage bins	Onetime expense 50 bins						$5,000.0
Environmental Management Specialist	$1,500.00 Per Month				$18,000.00 Yearly for 2 years	$18,000.00	$36,000.00 for 2 years
Environmental Inspector.	$1,000.00 per Year for two years				$12,000.00 for two years	$12,000.00	$24,000.00 For 2 years
Miscellaneous 10%							$8,395.00
Grand Total							**$92,345.00**

Source: Compiled by Consultant

7.4 REPORTING

The Project Management Team, inclusive of the Contractor, the Supervising Consultant and the MPW&C, is responsible for undertaking regular reporting, holding meetings and carrying out monitoring as described previously within the ESMP. These duties should be identified within the communications plan for ease of reference and clarity.

The general duties for routine daily and weekly inspection reports should be limited to the individuals and implemented as part of the general project administration and the ESMP reporting system.

7.4.1 REGULAR MEETINGS

To ensure proper communication on environmental matters, formal weekly meetings shall be held in the first instance and attended by the Supervising Consultant's Environmental Inspector, the Contractor's EMS and the MPW&C Environmental Engineer. These meetings shall be held throughout the duration of construction phase. The results from the meeting will be minuted and an Action Sheet prepared to monitor actions that are to be taken. The purpose of the meetings is to review progress on any outstanding requirements for corrective action and to strategize in going forward. The Environmental Inspector's weekly report would be an appropriate basis for the meeting agenda.

7.4.2 MONTHLY REPORT FROM THE CONTRACTOR

The EMS will produce a monthly performance report of environmental monitoring, summarizing the environmental monitoring and management of the project and other related environmental management problems. These reports will be submitted to the Contractor's Project Manager and the Supervising Consultant, which will find its way into the Supervising Consultant's monthly progress report to be submitted to the MPW&C and the IADB as the funding agency.

7.4.3 ENVIRONMENTAL MONITORING REPORT FROM THE PRIVATE SECTOR

Given that this project is likely to significantly impact the commercial sector an arrangement should be developed with the private sector, i.e., either the Private Sector Commission (PSC) or the Guyana Manufacturers and Service Association (GMSA) to monitor and report on the impact the project is having on commerce. The newly established MSC committee can handle communication and feedback.

7.4.4 SEMI-ANNUAL PMU REPORT

Every half year the Contractor, working out of the PMU will compile an environmental assessment working report, summarizing the progress with regards to the ESMP implementation, and monitoring status. This report will be prepared by the EMS and audited by the Contractor's Project Manager and may be attached to the Project Manager's Semi-Annual report or be integrated into "The Progress Report" and sent to the Supervising Consultant, the Client and the IADB for review.

7.5 ENVIRONMENTAL MONITORING DETAILS

Monitoring is necessary with respect to (i) soil and water resources quality and quantity ; (ii) monitoring environmental indicators related to design, construction and operation; (iii) socio-economic impacts, wildlife and natural resources management; (iv) maintenance and management, including inspection of work camps, erosion control, liquid and solid waste collection and management, road safety, traffic management and proper monitoring of the road corridor and other structures; and (v) monitoring of key environmental indicators indicated in Table .

No air pollution monitoring/data is required for the road rehabilitation/reconstruction project. The dust that will be generated during construction phase will be mitigated by the “Contractor” as indicated in their contracts. The contractor will regularly spray the dust with water hose and soak dust particles properly. The Project Engineer will mention this dust management clause in contractor’s agreement before construction.

However, EPA will be requested to take air samples from the project area once every six months and report the results to Contractor’s Project Manager in the event that corrective action is required.

8.0 CONCLUSIONS

It is clear the proposed upgrade of the Sheriff Street – Mandela Avenue Road will have some adverse effects on the bio-physical and socio-economic environments. The more far reaching indirect impact will be significant to monitor and mitigate. This has demonstrated the importance of sound planning at the design phase, high standard in project rehabilitation/reconstruction and on-going management in operation and post operation phases in promoting an environmentally sustainable, biodiversity friendly, technically and economically successful project.

This would necessitate the correct management practices for the control of the road and its environment. Before and after the design phase, a management practice is to be set in place for the control of road upgrading and its environment. An ever evolving traffic management plan and road safety programme must be implemented.

There are many significant benefits from the rehabilitated road, including improved road safety, reduced congestion, reduced time to transact business and reduced road. There has be some form of institutional strengthening, greater enforcement and implementation of the progeamme outlined in the social engagement plan.

For the long term sustainability of these economic and social benefits will depend on the importance of sound planning, high standard of project implementation and on-going management in promoting sustainable and environmentally sound development.

APPENDIX I: REPORTING FORMS

Environmental Inspection Report - Construction

Ministry of Public Works Project No. _____ Page 1 of 3

PROJECT: Sheriff Street Rehabilitation Project
ENVIRONMENTAL INSPECTION REPORT - CONSTRUCTION
INSPECTION DATE: INSPECTOR NAME:

LOCATION (chainage) _____ to _____ OR STAGING AREA (location)_____

Yes	No	N/A	General
			Sand bags, silt fencing and absorbent material readily available for emergencies Erosion and sediment control measures in place prior to construction Pre-construction photo log developed Right-of-way limit is marked/staked Equipment traffic and detour traffic are confined within R.O.W and or off-site staging areas Pedestrian movement separated from construction by barrier Traffic is re-routed around the construction site; speed and other traffic movement controls are in place Dust control measures in place
			Waste and Spills Management
			Garbage, scrap material and waste collected in suitable receptacles No servicing or refueling of equipment within 30 m of watercourse Spent oil, lubricants and filters collected and removed from site Refueling follows correct protocols Spill containment/absorption material available on site Vegetation material gathered for removal or for chipping and distribution within the R.O.W. Spill reporting protocols available on-site Waste construction material stockpiles no older than 30 days

			Erosion and Sediment Control
			Stockpiles do not interfere with surface drainage Stockpiles protected from wind and water erosion Silt fencing/trenching/berming in place adjacent to stockpiles Stockpiles not located within 10m of a watercourse
			Water Management
			Watercourse flow maintained (no obstructions) No equipment, waste materials or construction materials are stored within 10m of a Watercourse Site dewatering pump outlets to vegetated area (with energy dissipation); not within 10m of watercourse
			Additional comments provided on attached comment sheet. Yes /No

Environmental Inspector's Signature: Date:

Ministry of Public Works Project No. _____ Page 2 of 3

PROJECT: Sheriff Street Rehabilitation Project

ENVIRONMENTAL INSPECTION REPORT - CONSTRUCTION

INSPECTION DATE: INSPECTOR NAME:

LOCATION (chainage) _____ to _____ OR

STAGING AREA (location) _____

COMMENTS/OBSERVATIONS
General
Waste and Spills Management
Erosion and Sediment Control
Water Management

Environmental Inspector's Signature: Date:

Ministry of Public Works Project No. _____ Page 3 of 3

PROJECT:

Sheriff Street Rehabilitation Project

Report Date: _____

CORRECTIVE ACTION FOLLOW-UP REPORT

DATE OF NON-COMPLIANCE REPORT:_____

LOCATION (chainage) _____ to _____

OR STAGING AREA (location) _____

CONTRACTOR NAME: _____

CONTRACTOR REPRESENTATIVE (Print Name):_____

Nature of Non-Compliance (Attach copy of Inspector's Report):
Description of Corrective Action Taken (Attach photo)
Signature of Contractor Representative: Date:

Weekly Environmental Inspection Summary - Construction

Ministry of Public Works Project No. _____ Page 1 of 2

PROJECT: Sheriff Street Rehabilitation Project

WEEKLY ENVIRONMENTAL INSPECTION SUMMARY - CONSTRUCTION

WEEK OF:

Summary of Work Completed Location:
Location:
Location:
Location:
Location:
Outstanding Corrective Actions (attach extra sheet if necessary) Location:
Location:
Location:
Location:
Action Items and Status
:
Issues Raised

:
Environmental Inspector's Signature: Date:

Monthly Environmental Inspection Summary - Construction

Ministry of Public Works Project No. _____

PROJECT: Sheriff Street Rehabilitation Project

MONTHLY ENVIRONMENTAL INSPECTION SUMMARY - CONSTRUCTION

WEEK OF:

Summary of Work Completed Location:
Location:
Location:
Location:
Location:
Outstanding Corrective Actions (attach extra sheet if necessary) Location:
Location:
Location:
Location:
Action Items and Status

Issues Raised

Environmental Inspector's Signature: Date:

Quarterly Environmental Inspection Summary - Construction

Ministry of Public Works Project No. _____

PROJECT: Sheriff Street Rehabilitation Project

QUARTERLY ENVIRONMENTAL INSPECTION SUMMARY - CONSTRUCTION

MONTH/YEAR:

Summary of Construction Activity/Progress:
Summary of Environmental Mitigation:
Summary of Outstanding Corrective Actions
:
:
Issues Raised (e.g., public concerns, work stoppages, etc.)
:

Environmental Inspector's Signature: Date: