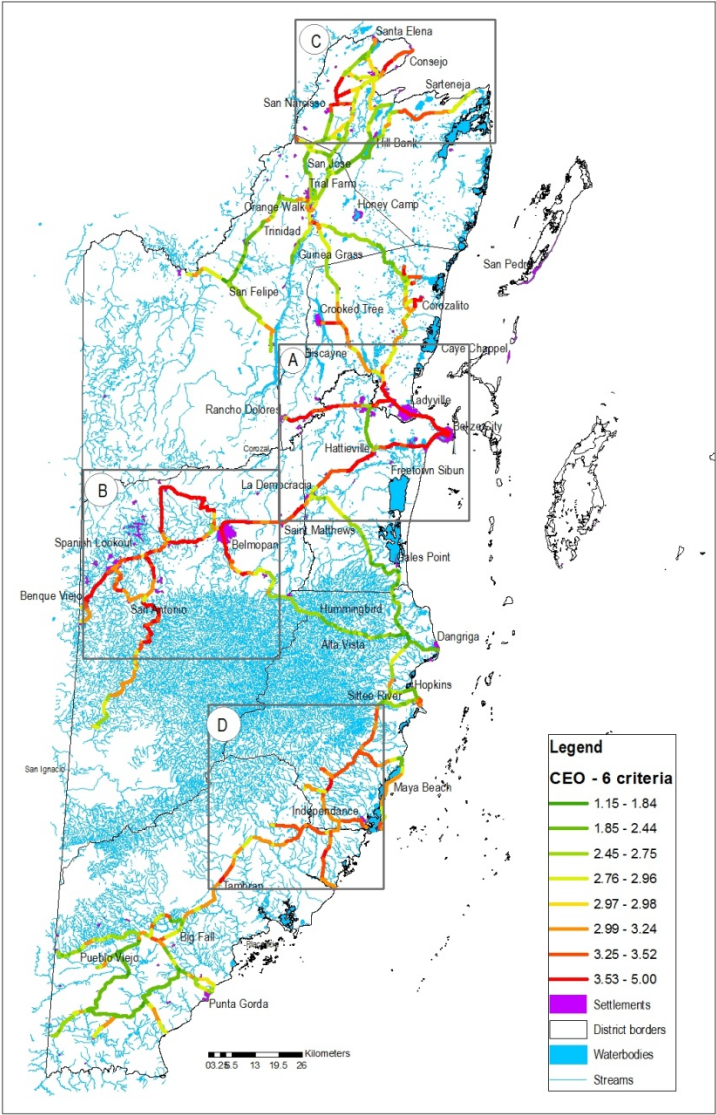


Environmental Management Framework

Belize Climate Resilient Infrastructure Project

3/20/2014



FINAL DRAFT

CONTENTS

Definitions7

Acronyms9

Executive Summary11

1. Introduction13

 1.1. Project Background13

 1.2. Environmental Context14

 1.3. Level of Environmental Mitigation Measures17

 1.4. Preparation and Use of this Framework18

 1.5. Purpose and Objectives of this EMF18

 1.6. Application of EMF19

2. Baseline Environmental Characteristics of Project Locations19

 2.1. Greater Belize city Area19

 2.1.1. Physical Environment19

 2.1.2. Biological Environment24

 2.2. West of Belmopan26

 2.2.1. Physical Environment26

 2.2.2. Biological Environment32

 2.3. Northern Area Around Corozal33

 2.3.1. Physical Environment33

 2.3.2. Biological Environment37

 2.4. Southern Area Around Independence39

 2.4.1. Physical Environment39

 2.4.2. Biological Environment45

3. Policy, Legal and Administrative Framework49

 3.1. The World Bank Safeguard Policies49

FINAL DRAFT

- 3.1.1. OP/BP 4.01 – Environmental Assessment (EA)..... 49
- 3.1.2. OP/BP 4.04 – Natural Habitats 50
- 3.1.3. OP/BP 4.11 – Physical Cultural Resources 51
- 3.1.4. OP 7.60 – Projects in Disputed Areas 51
- 3.1.5. Requirements for Public Disclosure..... 52
- 3.2. Belize National Laws and Regulations..... 52
 - 3.2.1. Environmental Law 53
 - 3.2.2. Natural Habitat Law..... 56
 - 3.2.3. Physical Cultural Resources Law..... 57
- 3.3. Belize Environmental Strategies 58
- 3.4. International Conventions and Agreements..... 59
- 4. Environmental Permits and Requirements..... 61
 - 4.1. Application of Local Environmental Instruments and Safeguards 61
 - 4.1.1. Impact Identification, Assessment and EA Process 61
 - 4.2. Methodology and Instruments 62
 - 4.2.1. Environmental Categorization 62
 - 4.2.2. Site Sensitivity and Environmental Categorization..... 63
- 5. Environmental Impacts and Mitigation Measures 65
 - 5.1. Noise during construction..... 65
 - 5.2. Dust and air emissions during construction..... 67
 - 5.3. Wildlife disturbance during construction 68
 - 5.4. Pollution of soil, groundwater, and waterways during construction 72
 - 5.5. Spillage of fuel and lubricants during construction 73
 - 5.6. Construction waste 73
 - 5.7. Management of vegetation and soil debris during construction..... 73
 - 5.8. Vegetation clearing during maintenance..... 74
 - 5.9. Workmen’s camps and settlements 75

FINAL DRAFT

5.10. Waterways during construction..... 78

5.11. Traffic diversion during construction..... 81

5.12. Residual negative impacts that cannot be mitigated..... 81

5.13. Opportunities for environmental enhancement 81

5.14. Extent and quality of available data, key data gaps, and uncertainties associated with predictions..... 81

6. Environmental Management Process and Screening Procedures..... 82

6.1. Environmental Impact Assessment..... 82

6.1.1. Environmental Clearance Process 82

6.1.2. Environmental Management Process..... 85

6.1.3. Internal Tool Form for Environmental Management 81

6.2. Dialogue and Disclosure Mechanism 81

6.2.1. Consultation/Dialogues required as a function of the environmental category 81

6.2.2. Category B Projects: MODERATE level of environmental risk 82

6.2.3. Category C Projects: LOW level of environmental risk 82

6.2.4. Disclosure 82

REFERENCES..... 83

Annex 1: Stakeholders Consulted 86

Annex 2: General Principles of Environmental Impact Assessment in Belize..... 88

Annex 3: Chance Find Procedures 93

Annex 4: Environmental Categorization Form..... 95

Annex 5: Environmental Follow-Up Report (EFUR) 97

Annex 6: Environmental Final Report (EFR)..... 98

Annex 7: Environmental/Social Screening..... 99

Annex 8: Sample LLES Format 104

Annex 9: Minutes of Consultation session with NGOs and Community Representatives..... 111

Annex 10: Minutes of Consultation session with GOB Representatives 116

FINAL DRAFT

FIGURES:

Figure 1: Main geographical area of priority (BCRIP)	13
Figure 2: Map of Belize showing ecosystem types	16
Figure 3: Map of Belize showing major soil units	20
Figure 4: Map of Belize showing tracks of major hurricanes (category 3 at landfall) since 1931	21
Figure 5: Map of Greater Belize City Area showing major watersheds	23
Figure 6: Greater Belize City Area showing protected areas	25
Figure 7: Map of Belize showing major soil units	28
Figure 8: Map of West of Belmopan Area showing major watersheds	31
Figure 9: West of Belmopan Area showing protected areas	33
Figure 10: Map of Belize showing major soil units	34
Figure 11: Northern Area around Corozal Area showing major watersheds	36
Figure 12: Northern Area around Corozal Area showing protected areas	38
Figure 13: Map of Belize showing major soil units	41
Figure 14: Map of Southern Area around Independence Area showing major watersheds	44
Figure 15: Southern Area around Independence Area showing protected areas	48
Figure 16: Simple Bird Observation Platform	71
Figure 17: Simple Bird Observation Platform	71
Figure 18: Typical sections through speed bump	71
Figure 19: Plan of speed bump	72
Figure 20: Typical section of "V" drain.....	74
Figure 21: Typical section of trapezoidal drain.....	74
Figure 22: MOW design specifications for utility corridor.....	76
Figure 23: Typical cross section of 66 feet right-of-way.....	76
Figure 24: Typical cross section of 100 feet right-of-way.....	78
Figure 25: Culvert headwall plan	80

FINAL DRAFT

Figure 26: Culvert headwall section80
Figure 27: Culvert headwall elevation80

TABLES:

Table 1: Main national legal instruments52
Table 2: Relevant international conventions & agreements59
Table 3: Site sensitivity63
Table 4: Environmental categorization matrix64
Table 5: Noise Level According to the dB Scale67
Table 6: Ministry of Works road service requirements75
Table 7: Environmental Management Plan77

DEFINITIONS

Project Cycle: Means the complete process of the project life cycle, which includes project identification, pre-feasibility study, feasibility study, project design, construction, operation, and closure.

Development Project: Means projects, activities and different objects existing or being newly undertaken and which involve the use of natural resources and create direct and/or indirect impacts on the environment and/or the society.

Development Project Owner: Means any natural person, juridical person or organizations that have the permission to study, explore, design, construct and implement a project. A project owner may come from the private sector, public/government sector or be an organization responsible for a development project.

Environmental Authority: Authority responsible for management and inspection of assessment work of impact on environment and society; in Belize, this authority is vested in the Ministry of Forest, Fisheries and Sustainable Development (MFFSD) and specifically the Department of Environment (DOE).

Project Screening: Means determination of proposed project types on whether it would be necessary or not for them to proceed with initial assessment of impact on environment and/or society or detailed environment impact assessment.

Scoping form TORs: Means process of determination of essential impact that requires study, collection of necessary data to prepare the report on environmental impact assessment which the DOE will inspect and approve as framework.

Environmental Management Framework (EMF): An EMF provides guidance to the project executing agency for Environmental Assessment procedures consistent with both the World Bank as well as the Host Country procedures. It describes an Environmental Assessment Process that should be followed in implementing the World Bank project. The Environmental Assessment Process should be consistent with both the Host Country and World Bank Environmental Assessment procedures. The EMF becomes the Environmental Chapter of the project's Operations Manual. Generally, a good EMF describes the steps to be taken in the Environmental Assessment Process and for each step; it specifies what must be done, who is responsible, and when it must be done.

Environmental Impact Assessment (EIA): Means the process of study and prediction of positive and negative impacts on environment and/or society together with determination of appropriate measures to protect against and mitigate the impact on environment and/or society from projects and different development activities.

Environment Management Plan (EMP): Means a plan stipulated in the EIA which defines environmental protection measures and impact mitigation; responsibility and

FINAL DRAFT

schedule for implementation of environmental management plan; monitoring plan and assessment of impacts on environment from the project that must be done including sufficient budget planning for environmental activities required during construction stage, operation and project termination. The EMP is submitted with the EIA as the case may be.

Environmental Monitoring: Means monitoring and evaluation of different development projects, including the implementation of Environmental Management Plans in accordance with agreed and officially approved processes and defined environmental quality criteria.

Environmental Safeguard Policies: The main objective of the World Bank Group's environmental and social development "safeguard" policies is to improve the sustainability of projects and programs supported by the bank – in line with the Bank's twin goals to be achieved in a sustainable manner. The policies are the reflection of international conventions and internationally accepted principles and good practice in project preparation and implementation. Similar principles, supporting the aspirations for sustainable development, are generally reflected in policies in most client countries; however, their implementation is often weak and variable.

ACRONYMS

ALIDES	Central American Alliance for Sustainable Development
BCRIP	Belize Climate Resilient Infrastructure Project
BECOL	Belize Electric Company Limited
BEL	Belize Electricity Limited
BERDS	Biodiversity and Environmental Resource Data System of Belize
BEST	Belize Enterprise for Sustainable Technology
BP	Bank Procedure
CCCCC	Caribbean Community Climate Change Center
CEO	Chief Executive Officer / Chief Environmental Officer
CFO	Chief Forest Officer
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CRIP	Climate Resilient Infrastructure Project
CZMAI	Coastal Zone Management Authority and Institute
DDT	Dichlorodiphenyltrichloroethane
DOE	Department of the Environment
EA	Environmental Assessment
ECF	Environmental Categorization Form
ECMEU	Environmental Compliance Monitoring and Enforcement Unit
ECP	Environmental Compliance Plan
EFR	Environmental Final Report
EFUR	Environmental Follow-up Report
EIA	Environmental Impact Assessment
EM	Environmental Management
EMF	Environmental Management Framework
EMP	Environmental Management Plan
ERI	Environmental Research Institute
ES	Environmental Screening
GHG	Greenhouse Gas
GIS	Geographic Information System
GOB	Government of Belize
GPH	George Price Highway
IUCN	International Union for Conservation of Nature
LLES	Limited Level Environmental Study

FINAL DRAFT

MFFSD	Ministry of Forestry, Fisheries and Sustainable Development
MNRA	Ministry of Natural Resources and Agriculture
MNREI	Ministry of Natural Resources, Environment, and Industry
MoFED	Ministry of Finance and Economic development
MoW	Ministry of Works
MoWT	Ministry of Works and Transport
NCRIP	National Climate Resilient Investment Plan
NEAC	National Environmental Appraisal Committee
NGO	Non-Governmental Organization
NMS	National Meteorological Service
NRI	Natural Resources Institute
OAS	Organization of American States
OP	Operational Policy
PCR	Physical Cultural Resources
PFB	Programme for Belize
PGH	Philip Goldson Highway
PPE	Personal Protective Equipment
PSF	Project Screening Form
PESF	Project Environmental Screening Form
QC	Quality Control
SIF	Social Investment Fund
TOR	Terms of Reference
UNESCO	United Nations Educational, Scientific and Cultural Organization
VOC	Volatile Organic Compound
WB	World Bank

EXECUTIVE SUMMARY

Most of Belize's long, low-lying coastline is at or near sea level and accommodates a large portion of its population and most of its business centers and industries. The country is frequently impacted by disasters such as hurricanes, tropical storms, floods, and to a lesser extent technological hazards, that have resulted in loss of life and destruction of property that are further exacerbated by the economic downturn, unemployment, poverty, environmental degradation, poor housing, and location of communities in vulnerable areas. Belize's geographical location and climatic manifestations have thus warranted that it be recognized as vulnerable to the adverse impacts of climate change and related events. With the consistent, large-scale warming of the world's land and ocean surface temperature, climate change and sea level rise will no doubt make Belize even more vulnerable to natural and technological hazards.

As part of a national effort to reduce the possible negative impacts that climate change and related events will bring about, the Government of Belize has obtained support from the World Bank for a Belize Climate Resilient Infrastructure Project that will seek to retrofit, rehabilitate, and reconstruct critical transportation infrastructure such as road segments, drainage systems, and stream crossings that are susceptible to flooding and highly critical to the socio-economic operation of the country.

This Environmental Management Framework has thus been produced in order to ensure that the Belize Climate Resilient Infrastructure Project is implemented in an environmentally sustainable manner and in full compliance with Belize's and the World Bank's environmental policies and regulations.

The specific objectives of this EMF are to:

- Assess the potential environmental impacts of the Project, whether positive or negative, and propose mitigation measures which will effectively address the impacts;
- Inform the project preparation process of the potential impacts of different alternatives, and relevant mitigation measures; and
- Establish clear directives and methodologies for the environmental screening of subprojects to be financed under the proposed Project.

A section of the Environmental Management Framework looks at the relevant environmental characteristics of the potential sub-projects' locations. It discusses the geology, topography, soils, climate, and surface and groundwater hydrology of the various geographical priority areas. This environmental characteristics section also highlights ambient air quality and existing sources of air emissions; and existing water pollution discharges and water quality. Furthermore, it also discusses existing flora and fauna; as well as rare or endangered species likely to be encountered; and those species with potential to become nuisances, vectors or dangerous. Sensitive habitats, including parks or preserves, significant natural sites, etc. are also discussed. A large obstacle hindering the availability of environmental data is the lack of an institutionalized national environmental monitoring program. A national environmental monitoring program would allow for the consistent and accurate gathering of data on specific environmental characteristics.

FINAL DRAFT

Another section of the Environmental Management Framework looks at the pertinent regulations and standards of the Government of Belize and the applicable World Bank Safeguard Policies governing environmental quality, health and safety, protection of sensitive areas, protection of endangered species and their habitat, siting, land use control, etc., at international, national, regional and local levels. This Environmental Management Framework is in compliance with the World Bank's requirements as presented in the Bank's Safeguard Policies OP/BP 4.01 (Environmental Assessment), OP/BP 4.04 (Natural Habitats), OP/BP 4.11 (Physical Cultural Resources), and OP/BP 7.60 (Projects in Disputed Areas). It is also prepared to comply with Belize's laws, regulations, policies, and guidelines related to environmental protection, and recognize that these are generally hindered by the lack of efficient implementation and monitoring due to financial and technical limitations. For example, although there have been many improvements in the Environmental Protection Act over the years, the lack of personnel and capacity at the Department of the Environment remains a challenge for enforcement of this key piece of legislation. Also, in many instances, Belize still lacks the capacity to implement some of its many international conventions and agreements. Better coordination among the various focal points and implementation activities for these conventions is needed.

A third section of the Environmental Management Framework discusses all the potential significant Project impacts, distinguishing between positive and negative impacts, direct, indirect, and any cumulative impacts, and immediate and long-term impacts. It also identifies impacts that are unavoidable or irreversible; characterizes the extent and quality of available environmental data, and explains significant information deficiencies and any uncertainty associated with predictions of impact. According to the Bank's Environmental Assessment Policy (OP4.01), the Project is classified as Category B meaning that environmental impacts for the type of work anticipated are expected to be moderate in nature and can be managed through the application of appropriate engineering and management measures. Some of the main environmental aspects include: soil erosion, wildlife disturbance, ambient noise, and dust and air emissions. Of special note are the potential environmental impacts that may be caused by the Chief Engineer of the Ministry of Works and Transport, who is authorized (under the Public Roads Act) to do many things, including erecting fences on the sides of roads and throwing road waste debris onto any adjacent lands. Although this is so, the Environmental Protection Act supersedes any other authority when it comes to matters relating to protection of the environment.

The Environmental Management Framework concludes with a section that discusses coordination with key government agencies, and the importance of obtaining the views of local NGOs and affected groups, and in keeping records of consultation meetings and other activities, communications, and comments. During the preparation of the EMF, consultation sessions were held with government representatives, and with NGOs and community representatives. Key recommendations included the development of sustained communication linkages amongst government ministries responsible for the management and use of the country's natural resources; and encouragement of public participation in decisions being made for the country that affect or impact the environment.

1. INTRODUCTION

1.1. PROJECT BACKGROUND

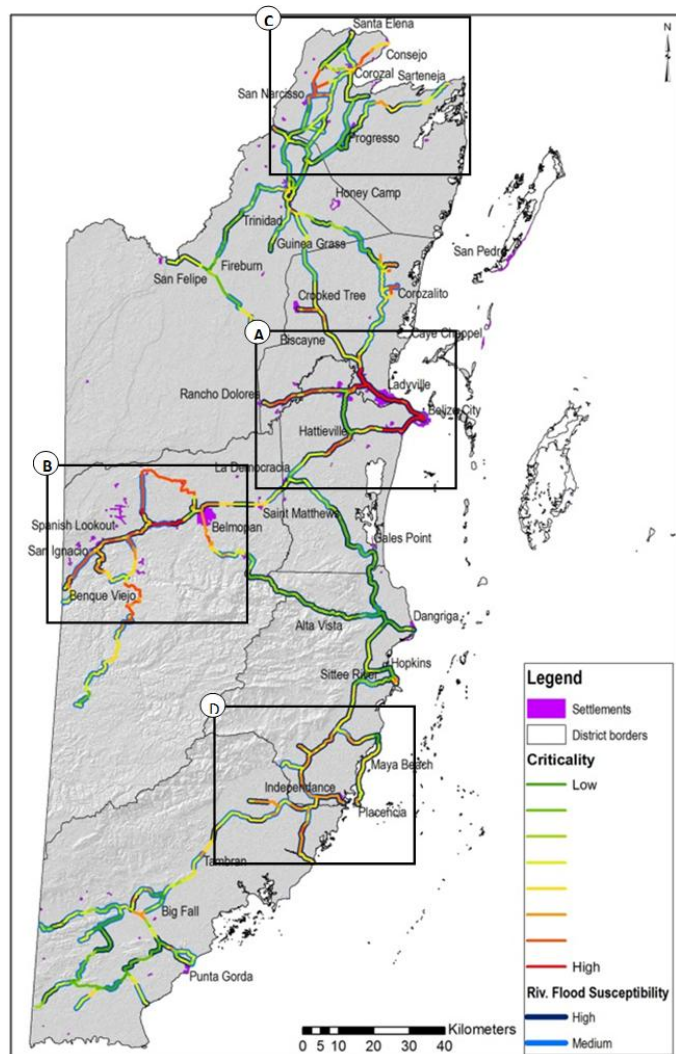
The Government of Belize (GOB) and the World Bank are in the Project Preparation Phase of the BCRIP which would be partially financed by a loan of US\$30 Million with counterpart funds to be determined. Under this project, road segments and stream crossings that are susceptible to flooding and highly critical to maintaining effective and secure transport networks would be considered for retrofitting and rehabilitation. This is in order to build and enhance climate resilience and also improve disaster risk management: both key to enabling sustainable national development. The application of an integrated and comprehensive approach to road infrastructure improvement would maximize the efficient use of resources.

In October, 2013 the Ministry of Finance and Economic Development (MoFED) submitted the National Climate Resilient Investment Plan (NCRIP) to Cabinet for endorsement. Following the extensive, nationwide multi-criteria analysis of flood susceptibility and road criticality carried out during NCRIP preparation, a prioritization has been carried out of the most important areas for investments in road and related hydrological improvement to reduce flood risk (see Figure 1). The roads, drainage and stream crossing improvements that can be financed under BCRIP will be selected from those identified as priority areas during the NCRIP preparation process.

The main geographical areas of priority are: A) Greater Belize City area, B) West of Belmopan, C) Northern Area around Corozal, and the D) Southern Area around Independence (see Figure 1). The specific sub-projects will be located within one or more of these areas. These main geographical areas encompass primary and secondary roads and will bear no impact to critical natural habitats, protected areas, or reserves.

The infrastructure activities (i.e., hydrological improvements that may include small-scale creek alignment,

Figure 1: Main geographical area of priority (BCRIP)



FINAL DRAFT

straightening of ox-bows, cut-and-fill, retaining walls along embankments, sizing of culverts to manage water flow better along the primary and secondary road networks, some replacement of culverts with small bridges; as well as road rehabilitation, road widening and shoulder improvement) are not expected to lead to pollution or degradation of the natural environment (soil, water, and air) nor disturbance to wildlife. In the event that there would be environmental impacts, however minimal, appropriate mitigation measures will be adopted. The Project may include safety measures (such as speed bumps) in areas that are densely populated, near schools, or in the vicinity of protected sites (e.g., national parks and reserves, and key ecological habitats).

1.2. ENVIRONMENTAL CONTEXT

Belize has abundant surface water resources¹. However, increases in population, energy generation from hydropower, and demands from the agricultural and tourism sectors have contributed to watershed impacts and overall reduction in water quality. The reduction of water quality has mainly come about as a result of deforestation and pollution².

Water pollution discharges in the project areas primarily originates from point and non-point sources, such as from waste generated by commercial (e.g., tourism) and industrial (e.g., agriculture, aquaculture, logging, manufacturing, mining, and oil) sectors. These sectors contaminate water resources with pathogens, organic matter, chemicals, sediments, and nutrients. Trans-boundary pollution from neighboring Guatemala and Mexico is suspected to be occurring but limited data is available³.

Similar to air emissions, receiving water quality in Belize is generally hindered by the lack of data and monitoring⁴, but there are standards for discharges into the environment that are stipulated by the DOE⁵.

A total of 85 terrestrial ecosystems have been identified for Belize (see

¹ Frutos, 2003

² BEST, 2008

³ Programme for Belize, 2003

⁴ Boles, Buck, & Esselman, 2008

⁵ Department of the Environment, 2011

FINAL DRAFT

Figure 2). This includes 96 habitat types (65 Terrestrial classes, 14 Marine classes, 7 Agriculture/silviculture/mariculture classes, 6 Mangrove classes, 3 inland water classes, and 1 urban class)⁶. Within these habitat types there are 3,408 species of vascular plants, including 700 species of trees and 300 species of orchids, have been identified. More than 150 species of mammals, more than 540 species of birds, 151 species of amphibians and reptiles, about 600 species of freshwater and marine fishes, and numerous invertebrates have also been identified⁷.

Few air quality studies have been done on greenhouse gases (GHGs) and other air pollutants (such as sulfur oxides, nitrogen oxides, carbon dioxide, methane, carbon monoxide, volatile organic compounds, particulates, toxic metals like lead and mercury, and chlorofluorocarbons) in Belize. But, according to a national inventory of emissions and sinks of GHGs conducted in Belize in 1997 and 2000, a number of sectors have been identified as sources: Energy; Industrial Processes and Solvents; Agriculture; Waste; Land use, Land Use Change and Forestry⁸ In addition, a separate greenhouse gas inventory development study was conducted for Belize in 2011 for the tourism sector. The accommodations and water transportation subsectors were highlighted as the main GHG contributors⁹.

A number of legislations are available for control of air emissions in Belize¹⁰. While air quality tests are generally not conducted by the Belize Department of the Environment (DOE), the preparation of an Environmental Impact Assessment and adherence to an Environmental Compliance Plan (ECP) may require that a developer conducts air quality tests and report the results to the DOE¹¹.

⁶ BERDS, 2014a

⁷ BERDS, 2014b

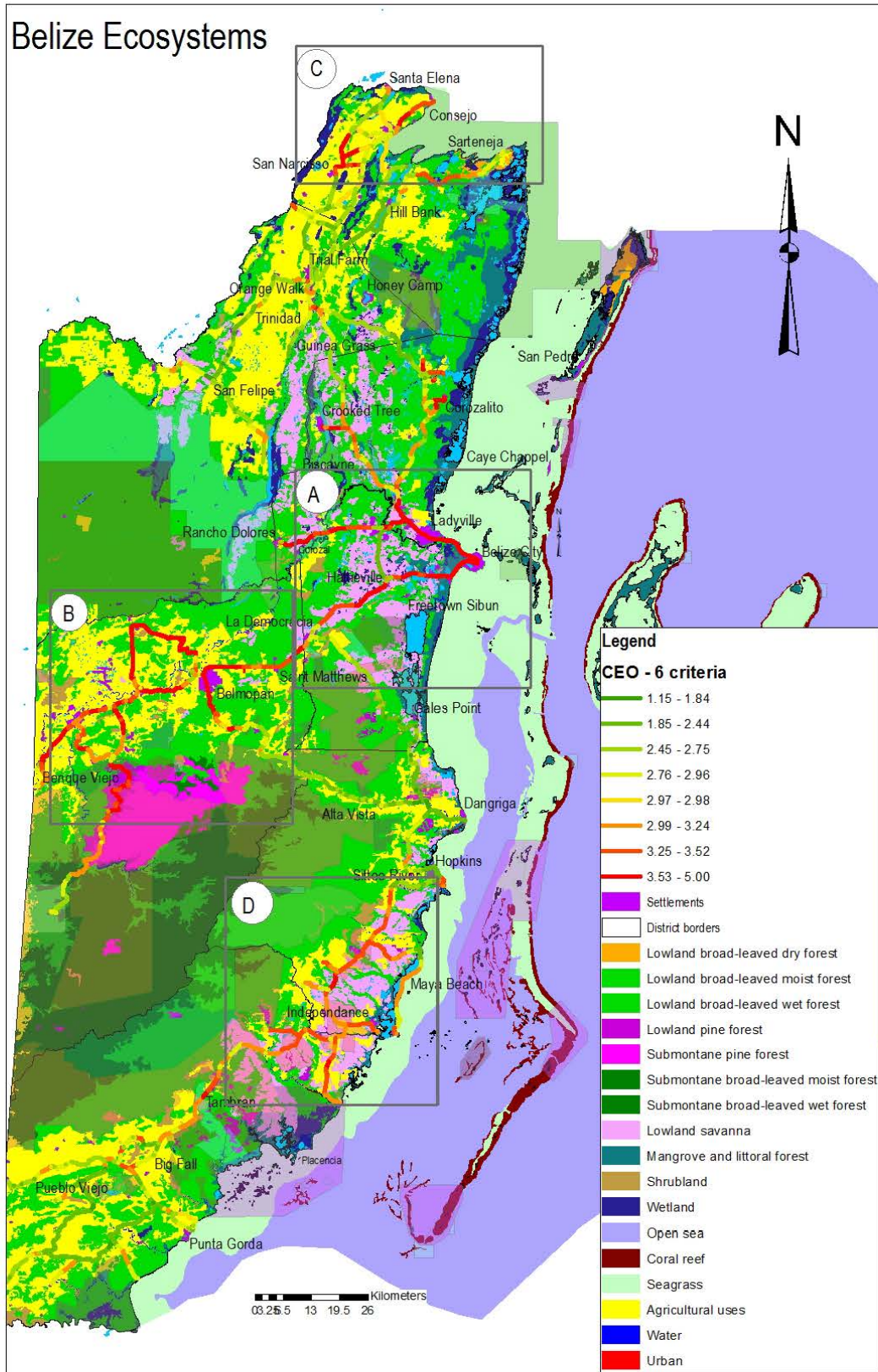
⁸ Second National Communication: United Nations Framework Convention On Climate Change, 2011

⁹ CCCCC, 2012

¹⁰ Belize Coastal Zone Management Authority and Institute, 2010

¹¹ Department of the Environment, 2011

Figure 2: Map of Belize showing ecosystem types



FINAL DRAFT

Belize has a number of terrestrial and aquatic species classified as critically endangered, endangered, vulnerable, and near threatened¹². In addition, a few species exist that are unique to the country. Belize has enacted many environmental protection laws aimed at the conservation, preservation, and management of these important natural resources. These laws have given rise to the establishment of many different types of protected areas. Today, 26% (2.6 million acres or 1.22 million hectares) of Belize's land and sea is preserved¹³ within a total of 95 protected areas, which vary in their purpose and level of protection. This network of protected areas exists under terrestrial reserves, marine reserves, and through officially recognized private conservation initiatives, and comprises national parks, nature reserves, wildlife sanctuaries, natural monuments, forest reserves, marine reserves, archaeological sites and archaeological reserves, and private reserves.

1.3. LEVEL OF ENVIRONMENTAL MITIGATION MEASURES

The appropriate level of environmental mitigation measures could range from the application of simple mitigation measures (using the Environmental and Social Checklist) to the preparation of a comprehensive EIA Report. The environmental and social screening process is consistent with Belize's environmental policies and laws as discussed in this Framework, as well as with the Bank's Operational Policy 4.01 (Environmental Assessment). This policy is triggered if a project is likely to have potential (adverse) environmental risks and impacts in its area of influence. OP 4.01 covers impacts on the natural environment (air, water and land); human health and safety; physical cultural resources; and trans-boundary and global environment concerns.

This project has been classified as Category B and thus environmental assessments are required during preparation of the sub-projects. According to the Policy, a Project is classified as Category B if:

“Its potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of a Category A Environmental Assessment (EA). As in a Category A project, the EA examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance. The findings and results of Category B EA are described in the project documentation”.

It is possible that the BCRIP will have some localized adverse environmental and social impacts that would require the application of appropriate mitigation measures. The Environmental Screening Form (see Section 6.1.1. and Annex 7) will enable sub-project implementers to

¹² Meerman, 2005

¹³ Meerman & Wilson, 2005

FINAL DRAFT

identify, assess and mitigate potential negative environmental impacts; to determine if a full environmental assessment is necessary; and to apply appropriate mitigation measures.

1.4. PREPARATION AND USE OF THIS FRAMEWORK

This EMF provides a guide to be used within the framework of existing Government Policy regulations for environmental processes and the Bank's safeguard policies. This EMF is a living document that will be subject to periodic review to address specific concerns raised by stakeholders, and emerging policy requirements. It will complement the environmental impact assessment and environmental audits guidelines provided for operationalization by provisions of the Environmental Protection Act (Rev. Ed. 2000-2003).

1.5. PURPOSE AND OBJECTIVES OF THIS EMF

The Environmental Protection Act and the EIA Regulations of Belize provide the general framework and procedures for carrying out EA and environmental management (EM) of development activities of all sectors (including the infrastructure development sector).

All projects receiving World Bank financing must adhere to the Bank's environmental and social safeguards policies (OP/BP 4.01, Environmental Assessment; OP/BP 4.04, Natural Habitats; OP/BP 4.11, Physical Cultural Resources; OP 7.60, and Projects in Disputed Areas). A framework approach is used in the case of investment operations with multiple sub-projects which are not definitively selected for inclusion in the project, prior to the start of project appraisal.

The EMF spells out an environmental safeguard policy framework, institutional arrangements, and capacity available to identify and mitigate potential safeguard concerns and impacts of each sub-project. This ensures that the sub-projects meet the national and local environmental requirements and are consistent with OP 4.01 and other applicable safeguard provisions of the Bank.

The EMF has been prepared with a view to providing mechanisms for resolving all adverse environmental impacts while enhancing positive benefits that may emanate from implementation of BCRIP activities. The EMF therefore, will provide a framework for environmental management in the development of BCRIP sub-projects.

The main objectives of the EMF include:

- Assessment of potential adverse environmental issues or impacts commonly associated with infrastructure rehabilitation and the ways to avoid, minimize or mitigate them;
- Establishment of clear procedures and methodologies for environmental planning, review, approval and implementation of sub-projects to be financed under the BCRIP; and
- Specification of roles and responsibilities and the necessary reporting procedures for managing and monitoring road infrastructural development environmental concerns.

FINAL DRAFT

1.6. APPLICATION OF EMF

Responsibility for environmental management, while taking into consideration the concerns of all stakeholders to the BCRIP, will lie with the implementing agencies who will be liable for planning and supervising environmental mitigation at the design, construction and operation phases of sub-projects with oversight supervision from SIF and the MoWT. Section 6.1.2 provides details on the entities that will bear responsibility for environmental monitoring and implementation of mitigation measures related to BCRIP.

2. BASELINE ENVIRONMENTAL CHARACTERISTICS OF PROJECT LOCATIONS

2.1. GREATER BELIZE CITY AREA

2.1.1. PHYSICAL ENVIRONMENT

The Greater Belize City Area is situated in the Belize District and includes primary and secondary roads on the George Price Highway (GPH) from Belize City to Mile 20; the Philip Goldson Highway (PGH) from Belize City to just beyond the junction with the Old Northern Road in San Hill Village; and the Bermudian Landing Road from the junction with the Burrell Boom Road to Ranch Dolores.

2.1.1.1. GEOLOGY AND SOILS

The Belize District lies in the northern half of the country that is relatively flat and forms part of the low lying carbonate Yucatan platform¹⁴, comprising shallow limestone soils, mantled in places by siliceous material of varying thickness¹⁵. There are some areas of hilly, karst terrain such as the Manatee Hills between Belize City and Dangriga. The relatively flat landscape of the coastal plains is covered with predominantly ferruginous sandy clay alluvial deposits¹⁶. The erosion of the Maya Mountains contributes most of the coastal and northern soils to the coastal plains. Soils in the northern half of the country and in the coastal plain and river valleys in the south are generally more fertile as they are derived, or associated with limestone parent materials¹⁷. Histosols soils found here are typically saline and organic, and exist mainly in the areas that are semi-permanently affected by water and support mangroves. Cambisols soils of intermediate fertility with relatively young soil profiles, and nutrient poor Gleysols that have poor seasonal drainage are also found within the project area¹⁸.

Figure 3 shows the map of Belize and its major soil units.

¹⁴ McCloskey & Keller, 2009

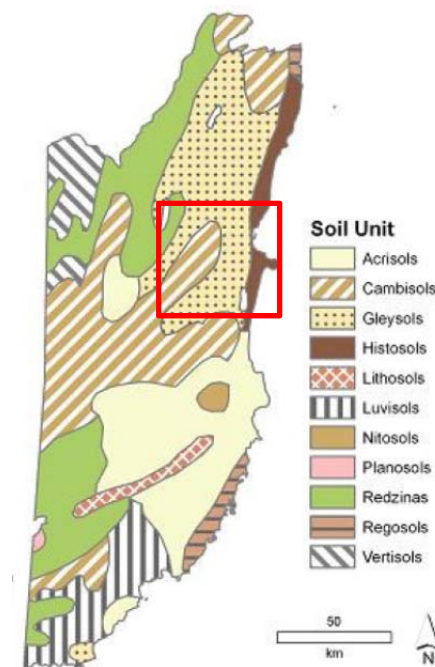
¹⁵ King, Baillie, Abell, Dunsmore, Gray, & Pratt et al., 1992

¹⁶ Ower, 1928

¹⁷ Flores, 1952

¹⁸ Darwin Initiative, 2000

Figure 3: Map of Belize showing major soil units¹⁹



2.1.1.2. TOPOGRAPHY

The northern lowlands are less than 200 feet (60 meters) above sea level and are drained by many major rivers and perennial streams²⁰, including the Belize River and Sibun River. The coastline is relatively flat and swampy, with many salt or brackish lagoons and the rivers crossing these coastal areas tend to be brackish in their lower reaches²¹. Westward from the northern coastal areas are the remains of old alluvial terraces, where the terrain changes from mangrove swamp to tropical pine savannah and hardwood forest²².

2.1.1.3. CLIMATE

Rainfall is generally variable from year to year in the north where it averages about 60 inches²³. Seasonal differences in rainfall are greatest in the northern and central regions of the country where, between January and April or May, fewer than 3.9 inches of rain fall per month. The dry season is longer in the north, normally lasting from February to May. A shorter, less rainy period usually occurs in late July or August, after the initial onset of the rainy season²⁴.

¹⁹ Darwin Initiative. UK

²⁰ Boles, 1999

²¹ Dixon, 1956

²² Merrill, 1992

²³ National Meteorological Service, 2014

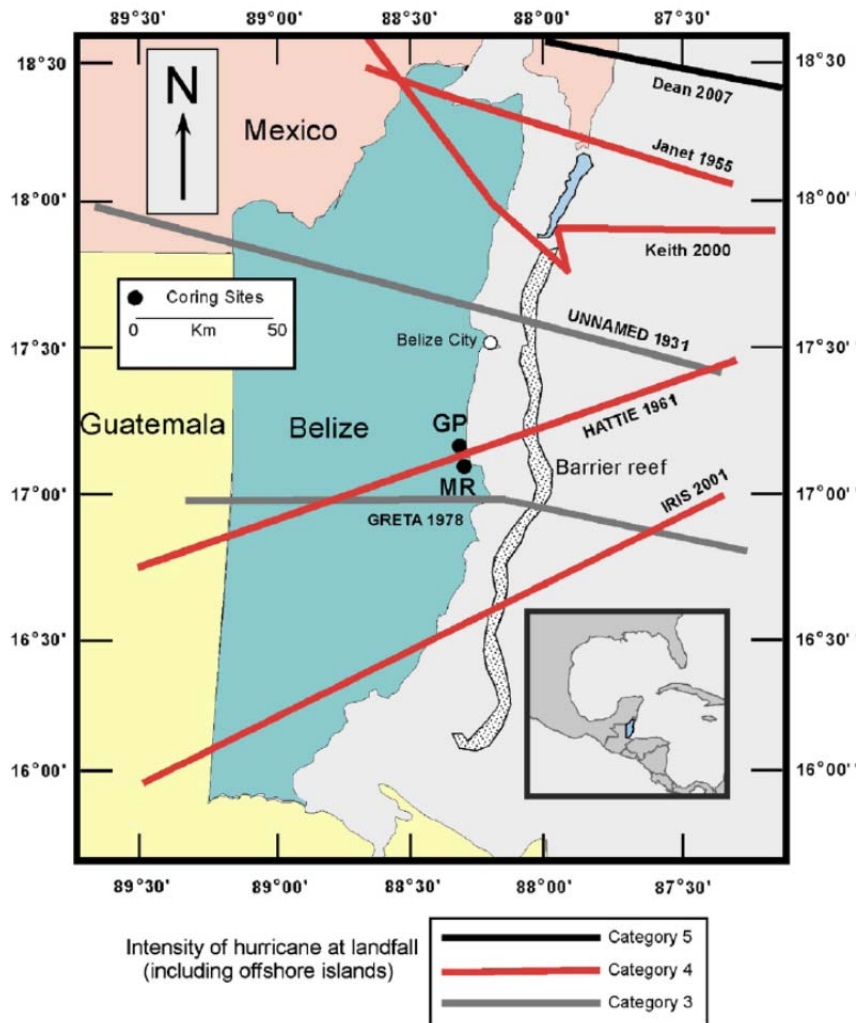
²⁴ Ibid

FINAL DRAFT

Temperatures are generally influenced by elevation, proximity to the coast, and the moderating effects of the northeast trade winds off the Caribbean. The average temperature in Belize is approximately 81 degrees Fahrenheit along the coast to 69 degrees Fahrenheit in the hills, with average highs of 85° and a mean low of 73°. The coldest month is January while the highest temperatures are experienced during the month of May²⁵. The annual mean humidity is 81.1%. Temperatures are slightly higher inland, except for the southern highland plateaus, such as the Mountain Pine Ridge, where it is noticeably cooler year round.

Within the Greater Belize City Area, an Unnamed Hurricane made landfall on Belize City in 1931²⁶, killing more than 2,000 people and destroying most of Belize City²⁷ (see Figure 4).

Figure 4: Map of Belize showing tracks of major hurricanes (category 3 at landfall) since 1931²⁸



²⁵ National Meteorological Service, 2014

²⁶ McCloskey & Keller, 2009

²⁷ Second National Communication: United Nations Framework Convention On Climate Change, 2011

²⁸ McCloskey & Keller

2.1.1.4. AMBIENT AIR QUALITY AND EXISTING SOURCES OF AIR EMISSIONS

Air emissions sources within the project area include the Belize Water Services Ltd. sewage treatment facility, Renco Battery Factory, and the former public garbage dumpsite at the municipal solid waste transfer station at Mile 3 on the GPH in Belize City; the Belize Brewing Company Ltd. in Ladyville; the Belize Electricity Limited backup diesel generator at 8 Miles; and from vehicular traffic throughout (Land and Surveys Department, 2010)²⁹. The burning of savannas and garbage dumps in and around smaller communities within the project area also contribute to air emissions³⁰. In addition, air sample tests conducted for organochlorine pesticides in Belize City in 2000 showed elevated levels of DDTs and aldrin/dieldrin³¹. DDT, aldrin, and dieldrin have been used primarily in Belize to protect crops from insects and in the fight against vector-borne diseases. These pesticides are now banned or restricted in Belize, but might still be used illegally in the agriculture sector³².

2.1.1.5. SURFACE AND GROUNDWATER HYDROLOGY

The Greater Belize City Area is located within the Belize River and Sibun River watersheds³³, and includes catchments from these two major rivers. The Belize River Watershed is the largest watershed in the country and the most populated³⁴. In addition, a number of freshwater and brackish water lakes or lagoons, ponds, streams, estuaries, rivulets, and wetlands exist³⁵. Groundwater is available throughout the area and is attributed to its geology (high-permeability calcareous sediments) and climatic conditions³⁶. High concentrations of chloride are found along the Belize and Sibun Rivers due to tidal effects and saltwater intrusion from the Caribbean Sea³⁷. Chloride waters are also evident in some inland wells within the project area and are likely a result of the dissolution of salts within the calcareous sediments³⁸. The occurrences of poor groundwater quality increase during the dry season when aquifer recharge is low³⁹.

Figure 5 shows the sections of watersheds including the major rivers and waterways that are found within the Greater Belize City Area.

²⁹ Land and Surveys Department, 2010

³⁰ Second National Communication: United Nations Framework Convention On Climate Change, 2011

³¹ Alegria, Bidleman, & Shaw, 2000

³² Ibid

³³ Boles, 1999

³⁴ Cherrington et al., 2012

³⁵ Frutos, 2003

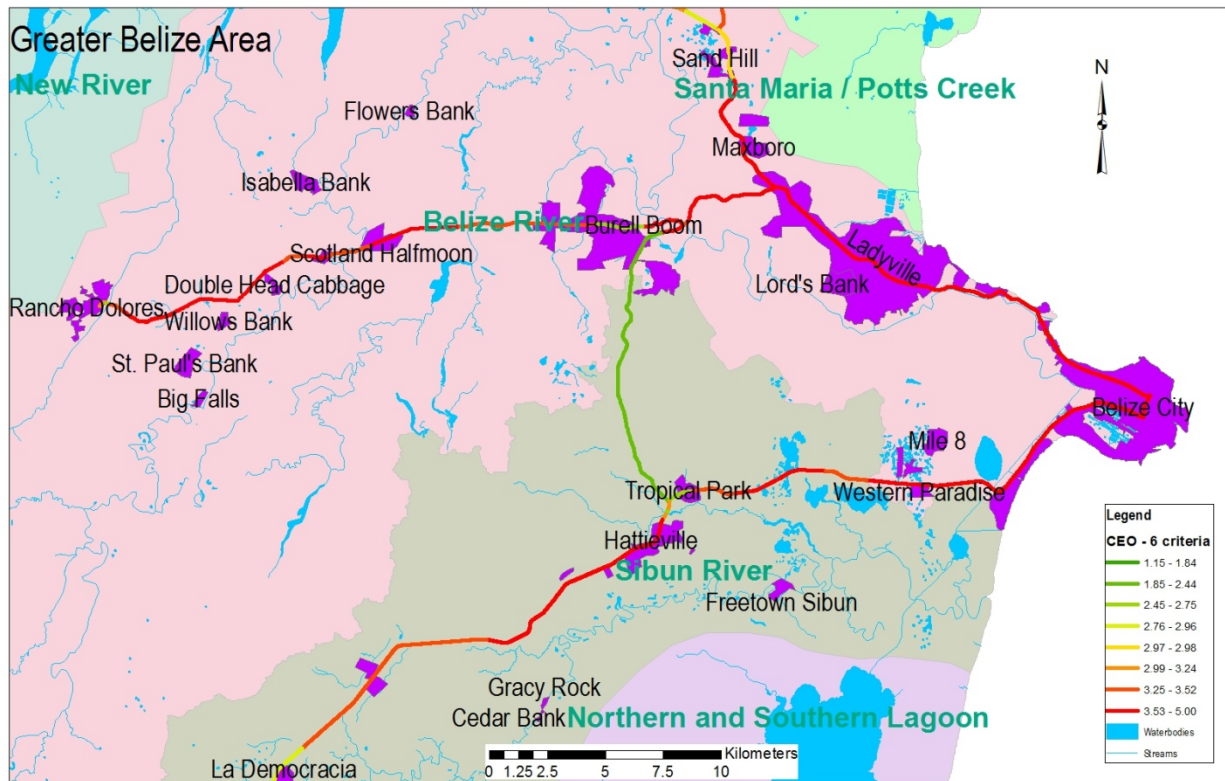
³⁶ Ibid

³⁷ Second National Communication: United Nations Framework Convention On Climate Change, 2011

³⁸ Medlin Jr., 2008

³⁹ Ibid

Figure 5: Map of Greater Belize City Area showing major watersheds



2.1.1.6. EXISTING WATER POLLUTION DISCHARGES AND RECEIVING WATER QUALITY

Uncontained solid waste contributes to water pollution discharges within the project area. Public garbage dumps, like the former dumpsite at the municipal solid waste transfer station at Mile 3 on the GPH⁴⁰, and smaller active ones in and around smaller communities may be introducing leachate into wetlands, swamps, and other water bodies and groundwater sources⁴¹. Since 2013, the operation of a Sanitary Landfill at Mile 24 on the GPH to service solid waste along the western corridor is expected to lessen surface and groundwater pollution. The Belize and Sibun Rivers receive contaminants from wastewaters from clothes washing, bathing, and septic tanks and latrines from communities along these riverbanks⁴².

Water pollution discharges within the project area also come from agricultural activities (including non-sustainable agriculture practices) and sand mining from communities along the Belize and Sibun Rivers⁴³. Effluent from Caribbean Shrimp farm and the Belize Brewing

⁴⁰ Department of the Environment, 2014

⁴¹ Young, 2008

⁴² Land and Surveys Department, 2010

⁴³ Karper & Boles, 2004

FINAL DRAFT

Company in Ladyville⁴⁴; the BEL backup diesel generator at 8 Miles⁴⁵; and from mechanic shops, carpentry shops, corn tortilla shops, and many other small businesses contaminates portions of the Belize River and Sibun River Watersheds and consequently these rivers as well.

2.1.2. BIOLOGICAL ENVIRONMENT

2.1.2.1. FLORA AND FAUNA

Within the Greater Belize City area, forest cover is typically lowland broad-leaved forest, lowland savanna, shrubland, mangrove and littoral forest, and wetland⁴⁶, that harbor flora species such as Trumpet Tree (*Cecropia peltata*), Caribbean Pine (*Pinus caribaea*), Bayleaf (*Sabal mauritiiiformis*), Cohune Palm (*Attalea cohune*), Red Mangrove, Black Mangrove, and White Mangrove, Stinking Toe Bukut (*Cassia grandis*), and Logwood (*Haematoxylon campechianum*)⁴⁷. These rich forest habitats provide homes for many fauna species including the Central American River Turtle (*Dermatemys mawii*), Morelet's Crocodile (*Crocodylus moreletii*), Green Iguana (*Iguana iguana*), Northern Raccoon (*Procyon lotor*), Common Opossum (*Didelphis marsupialis*), Yucatan Black Howler Monkey (*Alouatta pigra*) and Baird's Tapir (*Tapirus bairdii*)⁴⁸. In addition, about 396 species of birds have been recorded within the project area (Miller & Miller, 1997)⁴⁹, including the Great Blue Heron (*Ardea herodias*), Great-tailed Grackle (*Quiscalus mexicanus*), Plain Chachalaca (*Ortalis vetula*), Purple Gallinule (*Porphyrio martinica*) (Jones, 2003)⁵⁰, Turkey Vulture (*Cathartes aura*), and Yellow-headed Parrot (*Amazona oratrix*).

2.1.2.2. RARE OR ENDANGERED SPECIES

Some fauna species that occurs within the project area are considered rare or endangered and include the Yellow-headed Parrot⁵¹, and the Central American River Turtle⁵². The Yucatan Black Howler Monkey and Baird's Tapir, while designated as vulnerable in Belize, are classified as endangered under the International Union for Conservation of Nature (IUCN)⁵³.

⁴⁴ Department of the Environment, 2014

⁴⁵ Ibid

⁴⁶ BERDS, 2014a

⁴⁷ BERDS, 2014b

⁴⁸ Ibid

⁴⁹ Miller & Miller, 1997

⁵⁰ Jones, 2003

⁵¹ Ibid

⁵² BERDS, 2014b

⁵³ Meerman, 2005

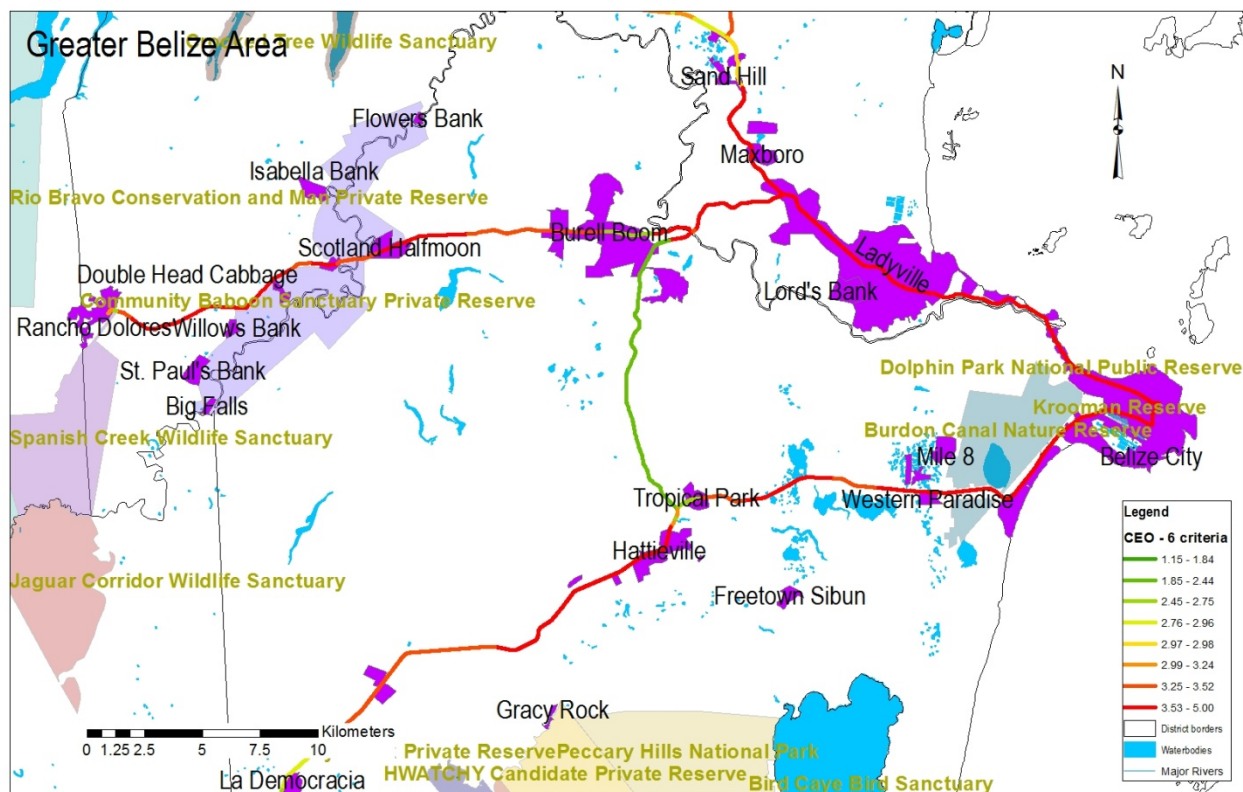
2.1.2.3. SPECIES WITH POTENTIAL TO BECOME NUISANCES, VECTORS OR DANGEROUS

The Water Hyacinth and Morelet’s Crocodile are two nuisance species known to occur within the project area. The Water Hyacinth tends to cover and clog drains and roadside ditches, thus impeding water flow and creating habitat for vectors like mosquitoes. The Morelet’s Crocodile may come in contact with people more often as a result of habitat loss⁵⁴.

2.1.2.4. SENSITIVE HABITATS, INCLUDING PARKS OR PRESERVES, SIGNIFICANT NATURAL SITES, ETC.

Some sensitive natural habitats, protected areas, and significant natural sites that are situated adjacent to and/or within the project area include: the Burdon Canal Nature Reserve (public protected area), and the Community Baboon Sanctuary (community protected area) – see Figure 6.

Figure 6: Greater Belize City Area showing protected areas



⁵⁴ Belize Forest Department, 2011

2.2. WEST OF BELMOPAN

2.2.1. PHYSICAL ENVIRONMENT

The project area West of Belmopan is situated in the Cayo District and includes the GPH from Mount Pleasant Creek west towards San Ignacio and the Belize-Guatemalan Border; the La Gracia Road, the Valley of Peace Road, the San Antonio Road, and the Pine Ridge Road starting at the Georgeville Junction.

2.2.1.1. GEOLOGY AND SOILS

Situated just north of the Maya Mountains, the geology of the project area is characteristic of hilly, rugged, rolling limestone regions containing numerous sinkholes, caverns, and underground streams⁵⁵. There are some areas of hilly, karst terrain such as the Yalbac Hills along the western border with Guatemala. The soils of the sub-project area are indicative of Cambisols with intermediate fertility and with relatively young soil profiles (see

⁵⁵ Ministry of Natural Resources, Environment, and Industry, 2002

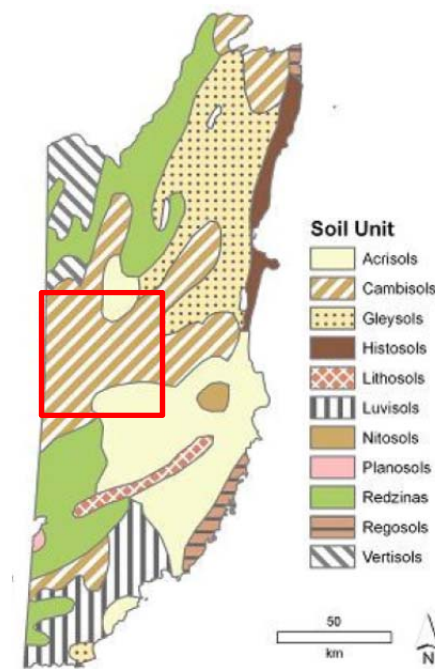
FINAL DRAFT

Figure 7). These soils found in an arc around the Maya Mountains are probably derived as erosion products from the higher land⁵⁶. Soils formed on limestone tend to have pH near neutral, dark topsoils, high levels of base saturation, and high clay content. The soils of the Maya Mountains area are mostly shallow and stony, tend to be highly variable, and depend largely on the nature of the parent material (mostly granite, quartz, shales, gneisses, and schist)⁵⁷.

⁵⁶ Darwin Initiative, 2000

⁵⁷ BEST, 2008

Figure 7: Map of Belize showing major soil units⁵⁸



2.2.1.2. TOPOGRAPHY

This rugged, well-vegetated northern foothill of the Maya Mountains plateau is drained by the Belize, Mopan, and Macal rivers and their tributaries. The Cockscomb Range, a spur of the Maya Mountains, runs toward the sea and culminates in Doyle’s Delight, which at an elevation of 3,688 feet (1,124 metres) is the highest point in Belize⁵⁹.

2.2.1.3. CLIMATE

Seasonal differences in rainfall here are greatest for the country, except for the northern regions where, between January and April or May, fewer than 3.9 inches of rain fall per month⁶⁰. Temperatures are generally influenced by elevation, proximity to the coast, and the moderating effects of the northeast trade winds off the Caribbean. The average temperature in Belize is approximately 81 degrees Fahrenheit along the coast to 69 degrees Fahrenheit in the hills, with average highs of 85° and a mean low of 73°. The coldest month is January while the highest temperatures are experienced during the month of May⁶¹. The annual mean humidity is 81.1%. Temperatures are slightly higher inland, except for the southern highland plateaus, such as the Mountain Pine Ridge, where it is noticeably cooler year round.

⁵⁸ Darwin Initiative. UK

⁵⁹ Programme for Belize, 2003

⁶⁰ National Meteorological Service, 2014

⁶¹ Ibid

FINAL DRAFT

In 1961 and 1978, Hurricane Hattie and Hurricane Greta respectively, crossed the country near its central region and devastated coastal towns¹. Hurricane Hattie is well known for destroying the old capital Belize City and prompting its relocation to the City of Belmopan⁶².

2.2.1.4. AMBIENT AIR QUALITY AND EXISTING SOURCES OF AIR EMISSIONS

Air emissions sources within the project area include Travelers Liquors Ltd., the public garbage dump site, and the sewage treatment plant in the City of Belmopan. Also contributing to air emissions are the Tiger Run Farm Ltd. meat processing factory and the Cayo tropical Fruits Ltd. fruit processing factory in the vicinity of San Ignacio Town. The solid waste transfer station on the Benque Viejo Road; slash and burn agriculture; the burning of garbage dumps in and around other communities; and vehicular traffic throughout also contribute to air emissions⁶³. In addition, air sample tests conducted for organochlorine pesticides in Belmopan City in 2000 showed elevated levels of DDTs and aldrin/dieldrin⁶⁴. DDT, aldrin, and dieldrin have been used primarily in Belize to protect crops from insects and in the fight against vector-borne diseases. These pesticides are now banned or restricted in Belize, but might still be used illegally in the agriculture sector⁶⁵.

2.2.1.5. SURFACE AND GROUNDWATER HYDROLOGY

The West of Belmopan Area is located within the Belize River watershed⁶⁶, and includes catchments from the Belize River, Mopan River, and Macal River. Freshwater streams, and rivulets are abundant in the area⁶⁷ and groundwater is generally available throughout the less mountainous parts of the project area consisting of high-permeability calcareous sediments⁶⁸.

⁶² Second National Communication: UN Framework Convention on Climate Change, 2011

⁶³ Land and Surveys Department, 2010

⁶⁴ Alegria, Bidleman, & Shaw, 2000

⁶⁵ Ibid

⁶⁶ Boles, 1999

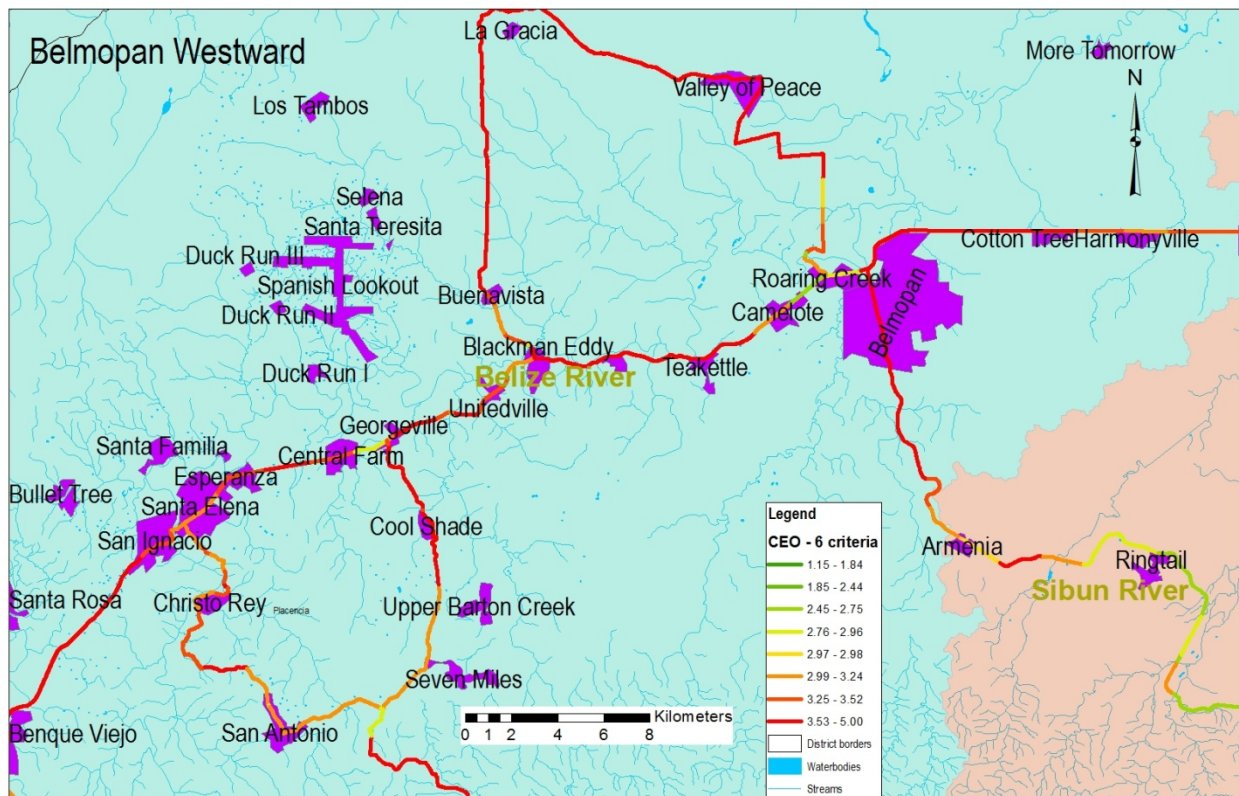
⁶⁷ Frutos, 2003

⁶⁸ Second National Communication: UN Framework Convention on Climate Change, 2011

FINAL DRAFT

Figure 8 shows the sections of watersheds including the major rivers and waterways that are found within the West of Belmopan Area.

Figure 8: Map of West of Belmopan Area showing major watersheds



2.2.1.6. EXISTING WATER POLLUTION DISCHARGES AND WATER QUALITY

There are many public garbage dumps that are contributing to pollution of surface and groundwater resources within the project area. Chief among them are the Belmopan dump site that may be discharging leachate into the Belize River, and the solid waste transfer station on the Benque Viejo Road⁶⁹ that may also be introducing leachate into the Mopan and Macal Rivers. Water pollution also results from the many smaller garbage dumps in other communities throughout the project area, and from wastewaters from clothes washing, bathing, and septic tanks and latrines from communities along the Belize, Macal, and Mopan riverbanks⁷⁰.

Sand mining of the Belize, Macal, and Mopan riverbanks and intensive agriculture activities primarily within the Belize River Valley⁷¹ contribute to pollution of the Belize River Watershed⁷². Effluent from the Belmopan dump site; Travelers Liquors Ltd.⁷³, and the sewage treatment plant in the City of Belmopan empty into the Belize River while effluent from the Tiger Run Farm Ltd. meat processing factory and the Cayo Tropical Fruits Ltd. fruit processing

⁶⁹ Department of the Environment, 2014

⁷⁰ Land and Surveys Department, 2010

⁷¹ Ministry of Natural Resources, Environment, and Industry, 2002

⁷² Ower, 1928

⁷³ Department of the Environment, 2014

FINAL DRAFT

factory⁷⁴ in the vicinity of San Ignacio Town eventually reach the Macal River. Both the Quality Poultry Products meat processing factory and the Western Dairies dairy processing factory in Spanish Lookout⁷⁵ discharge effluents into the Belize River, while the solid waste transfer station on the Benque Viejo Road pollute the Mopan River. The water resources within the project area also receive contaminants from mechanic shops, carpentry shops, corn tortilla shops, and many other small business enterprises.

2.2.2. BIOLOGICAL ENVIRONMENT

2.2.2.1. FLORA AND FAUNA

Within the West of Belmopan area, forest cover is typically lowland broad-leaved forest, lowland savanna, and shrubland⁷⁶. Found growing in these lush habitats are the Guanacaste (*Enterolobium cyclocarpum*), Bullrush (*Zamia prasina*), Nargusta (*Terminalia amazonia*), Bayleaf (*Sabal mauritiiformis*), Mountain Pimento (*Schippia concolor*, [endemic species]), Caribbean Pine (*Pinus caribaea*), Cohune Palm (*Attalea cohune*), False Jade (*Chamaedorea neurochlamys Burret*), and Quamwood (*Schizolobium parahyba*)⁷⁷. These unique ecosystems also provide homes for an array of fauna, including the Central American River Turtle (*Dermatemys mawii*), Green Iguana (*Iguana iguana*), Parrot Snake (*Leptophis ahaetulla*), Central American Agouti (*Dasyprocta punctata*), Baird's Tapir (*Tapirus bairdii*), and Tayra (*Eira barbara senex*)⁷⁸. In addition, about 349 species of birds have been recorded within the project area⁷⁹, including the Summer Tanager (*Piranga rubra*), Brown Jay (*Psilorhinus morio*), Tropical Kingbird (*Tyrannus melancholicus*), Ferruginous Pygmy-Owl (*Glaucidium brasilianum*)⁸⁰, and Dusky Antbird (*Cercomacra tyrannina*).

2.2.2.2. RARE OR ENDANGERED SPECIES

The Central American River Turtle is a rare or endangered fauna that occurs within the project area. The Baird's Tapir is designated as vulnerable in Belize but endangered under the IUCN⁸¹.

2.2.2.3. SPECIES WITH POTENTIAL TO BECOME NUISANCES, VECTORS OR DANGEROUS

No species with potential to become nuisances, vectors or dangerous are known to occur within the project area.

⁷⁴ Department of the Environment, 2014

⁷⁵ Ibid

⁷⁶ BERDS, 2014a

⁷⁷ BERDS, 2014b

⁷⁸ Ibid

⁷⁹ Miller & Miller, 1997

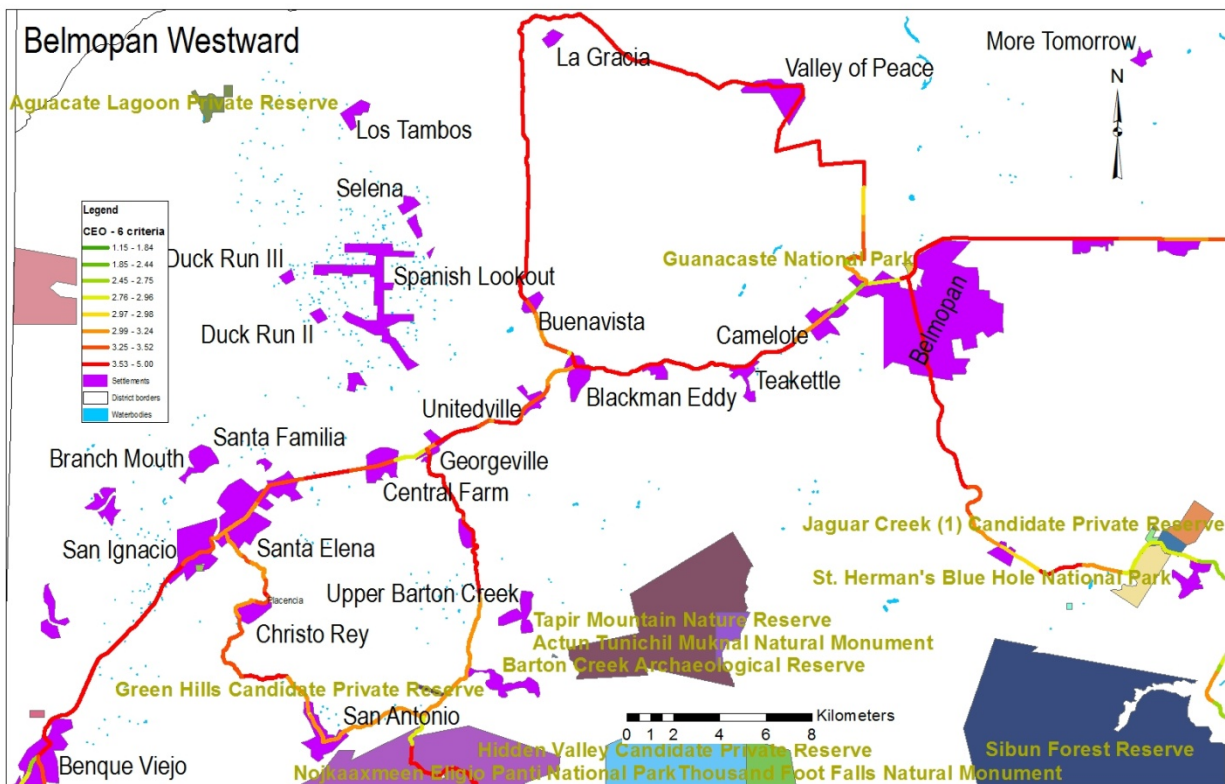
⁸⁰ Jones, 2003

⁸¹ Meerman, 2005

2.2.2.4. SENSITIVE HABITATS, INCLUDING PARKS OR PRESERVES, SIGNIFICANT NATURAL SITES, ETC.

Some sensitive natural habitats, protected areas, and significant natural sites that are situated adjacent to and/or within the project area include the Guanacaste National Park, and the Cahal Pech, Baking Pot, and Xunantunich archaeological sites – see Figure 9.

Figure 9: West of Belmopan Area showing protected areas



2.3. NORTHERN AREA AROUND COROZAL

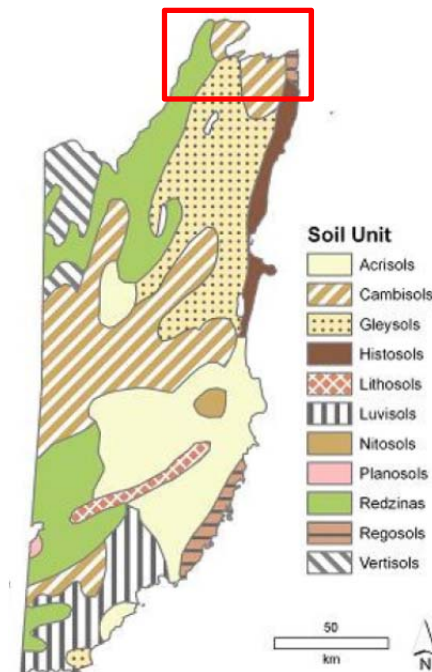
2.3.1. PHYSICAL ENVIRONMENT

The project area in the Northern Area Around Corozal is situated in the Corozal District and includes roads in the vicinity of San Narciso Village, Buena Vista to Libertad, Remate - Patchakan - Philip Goldson Highway and the road connecting, Patchakan to Corozal Town, Consejo Village Road, and the Little Belize – Chunox – Sarteneja Road.

2.3.1.1. GEOLOGY AND SOILS

The Corozal District lies in the northern half of Belize characterized by the relatively flat landscape and low lying carbonate platform of the Yucatan⁸². This northern area comprises shallow limestone soils that are mantled in places by siliceous material that vary in thickness⁸³. Predominantly ferruginous Sandy clay alluvial soils from the erosion of the Maya Mountains cover the relatively flat landscape of the coastal plains³. The three main soil units found within the project area include Cambisols soils of intermediate fertility with relatively young soil profiles, nutrient poor Gleysols that has poor seasonal drainage, and clay rich soils like Redzinas that can conserve water in the dry season (see Figure 10)⁸⁴.

Figure 10: Map of Belize showing major soil units⁸⁵



2.3.1.2. TOPOGRAPHY

The northern lowlands within the project area are no more than 200 feet (60 metres) above sea level and drained by the Rio Hondo and New Rivers and many perennial streams⁸⁶. The coastline is relatively flat and swampy with many salt or brackish lagoons⁸⁷.

⁸² McCloskey & Keller, 2009

⁸³ King, Baillie, Abell, Dunsmore, Gray, Pratt, et al., 1992

⁸⁴ Darwin Initiative, 2000

⁸⁵ Darwin Initiative. UK

⁸⁶ Boles, 1999

⁸⁷ Dixon, 1956

2.3.1.3. CLIMATE

Rainfall in this northern region averages about 60 inches for the year⁸⁸, with pronounced seasonal differences. Between January and April or May, fewer than 3.9 inches of rain fall per month here. The dry season is relatively long, typically lasting from February to May. There is usually a short, dry period that typically occurs in late July or August, after the initial onset of the rainy season⁸⁹.

The average temperature in Belize vary from 81 degrees Fahrenheit along the coast to about 69 degrees Fahrenheit in the hills, with average highs of 85° and a mean low of 73°. The hottest month is in May while the lowest temperatures are experienced during the month of January⁹⁰. Except for the southern highland plateaus, such as the Mountain Pine Ridge, that is noticeably cooler year round, the temperatures inland tend to be slightly higher. The average humidity is about 81%.

The Northern Area around Corozal has witnessed passage of three powerful hurricanes: Hurricane Janet in 1955, Hurricane Keith in 2000, and Hurricane Dean in 2007⁹¹.

2.3.1.4. AMBIENT AIR QUALITY AND EXISTING SOURCES OF AIR EMISSIONS

Air emissions sources within the project area include Belize Fruit Packers Company Ltd. and the public garbage dumpsite in Corozal Town, and Little Belize Exporters Ltd. Exhaust from vehicular traffic, and the burning of sugarcane plantations and garbage dumps throughout the project area also contribute to air emissions⁹².

2.3.1.5. SURFACE AND GROUNDWATER HYDROLOGY

The Northern Area around Corozal is located within the Rio Hondo, New River, and other minor coastal watersheds⁹³, and includes catchments from these two major rivers. The Rio Hondo Watershed is the largest for which Belize is a part, with its greater portions existing in neighbouring Mexico and Guatemala⁹⁴. Within this area, a number of freshwater and brackish water lagoons, ponds, streams, estuaries, rivulets, and wetlands also exist⁹⁵. Plenty of groundwater exists throughout, attributable to the areas high-permeability calcareous sediments and climatic conditions⁹⁶. High concentrations of chloride are found along the rivers and in some inland well that are subject to tidal effects and saltwater intrusion from the

⁸⁸ National Meteorological Service, 2014

⁸⁹ Ibid

⁹⁰ Ibid

⁹¹ McCloskey & Keller, 2009

⁹² Land and Surveys Department, 2010

⁹³ Boles, 1999

⁹⁴ Ibid

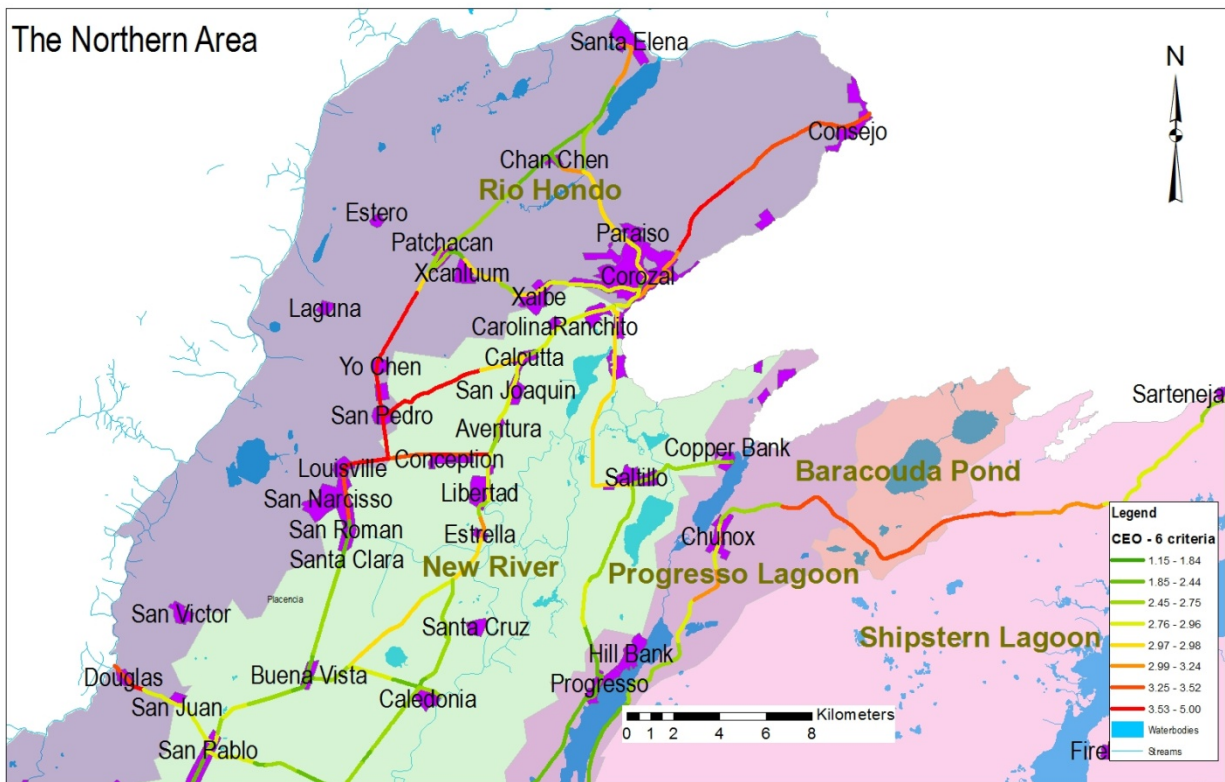
⁹⁵ Frutos, 2003

⁹⁶ Ibid

Caribbean Sea, and where there is dissolution of salts within the calcareous sediments⁹⁷. In the Corozal District, in particular, there is evidence of large concentrations of hardness and sulphate in the groundwater⁹⁸, and the occurrence of poor groundwater quality increases during the dry season when aquifer recharge is low.

Figure 11 shows the sections of watersheds including the major rivers and waterways that are found within the Northern Area around Corozal Area.

Figure 11: Northern Area around Corozal Area showing major watersheds



2.3.1.6. EXISTING WATER POLLUTION DISCHARGES AND WATER QUALITY

Within the project area, the contamination of New River, Progresso Lagoon, and other water sources are as a result of leachate run-off from the Corozal Town public garbage dump, as well as from other smaller garbage dumps in neighbouring communities. These water resources are also being impacted by wastewaters from domestic activities (such as clothes washing, bathing, and septic tanks and latrines) from communities along these waterways⁹⁹.

⁹⁷ Second National Communication: United Nations Framework Convention On Climate Change, 2011

⁹⁸ Medlin Jr., 2008

⁹⁹ Land and Surveys Department, 2010

FINAL DRAFT

Water pollution discharges within the project area also come from agricultural activities (including non-sustainable agriculture practices) and sand mining from communities along the New River and Progreso Lagoon¹⁰⁰. Effluent from Belize Fruit Packers Company Ltd in Corozal Town; Little Belize Exporters Ltd.¹⁰¹; and from mechanic shops, carpentry shops, corn tortilla shops, and many other small businesses contaminates portions of the Rio Hondo and New River Watersheds and consequently these rivers as well. Notably, effluent from the Belize Sugar Factory, Cuello's Distillery, and L&R Liquors Ltd. in Orange Walk¹⁰² are contamination the New River with thermal and chemical pollution. There is also an ethanol factory in Libertad Village that is currently non-functional but could potentially be a source of pollution for the New River and the northern marine environment as well.

2.3.2. BIOLOGICAL ENVIRONMENT

2.3.2.1. FLORA AND FAUNA

Within the Northern Area around Corozal, forest cover is typically lowland broad-leaved forest, lowland broad-leaved dry forest, lowland savanna, shrubland, mangrove and littoral forest, and wetland¹⁰³, harboring a number of unique flora including the Red Mangrove, Black Mangrove, White Mangrove¹⁰⁴, Warrie Wood (*Caesalpinia gaumeri*), *Senna atomaria*, Black Poisonwood (*Metopium brownie*), *Dalbergia glabra*, Purple Passionfruit (*Passiflora edulis*), Logwood (*Haematoxylon campechianum*), and Bamboo Palm (*Chamaedorea seifrizii*)¹⁰⁵. Notable fauna that also make these habitats home include the Green Vine Snake (*Oxybelis fulgidus*), Black Iguana (*Ctenosaura similis*), Tabasco Mud Turtle (*Kinosternon acutum*), Nine-banded Armadillo (*Dasypus novemcinctus mexicanus*), Coatimundi (*Nasua narica*), Paca (*Agouti paca nelsoni*), and Yucatan Squirrel (*Sciurus yucatanensis*)¹⁰⁶. In addition, about 249 species of birds have been recorded within the project area¹⁰⁷, including the Yellow-billed Cacique (*Amblycercus holosericeus*), Gray catbird (*Dumetella carolinensis*), Crested Guan (*Penelope purpurascens*), Wood Stork (*Mycteria americana*), and Red-winged Blackbird (*Agelaius phoeniceus*)¹⁰⁸.

2.3.2.2. RARE OR ENDANGERED SPECIES

No rare or endangered flora and fauna species are known to occur within the project area.

¹⁰⁰ Karper & Boles, 2004

¹⁰¹ Department of the Environment, 2014

¹⁰² Ibid

¹⁰³ BERDS, 2014a

¹⁰⁴ Meerman, 2005

¹⁰⁵ BERDS, 2014b

¹⁰⁶ Ibid

¹⁰⁷ Miller & Miller, 1997

¹⁰⁸ Jones, 2003

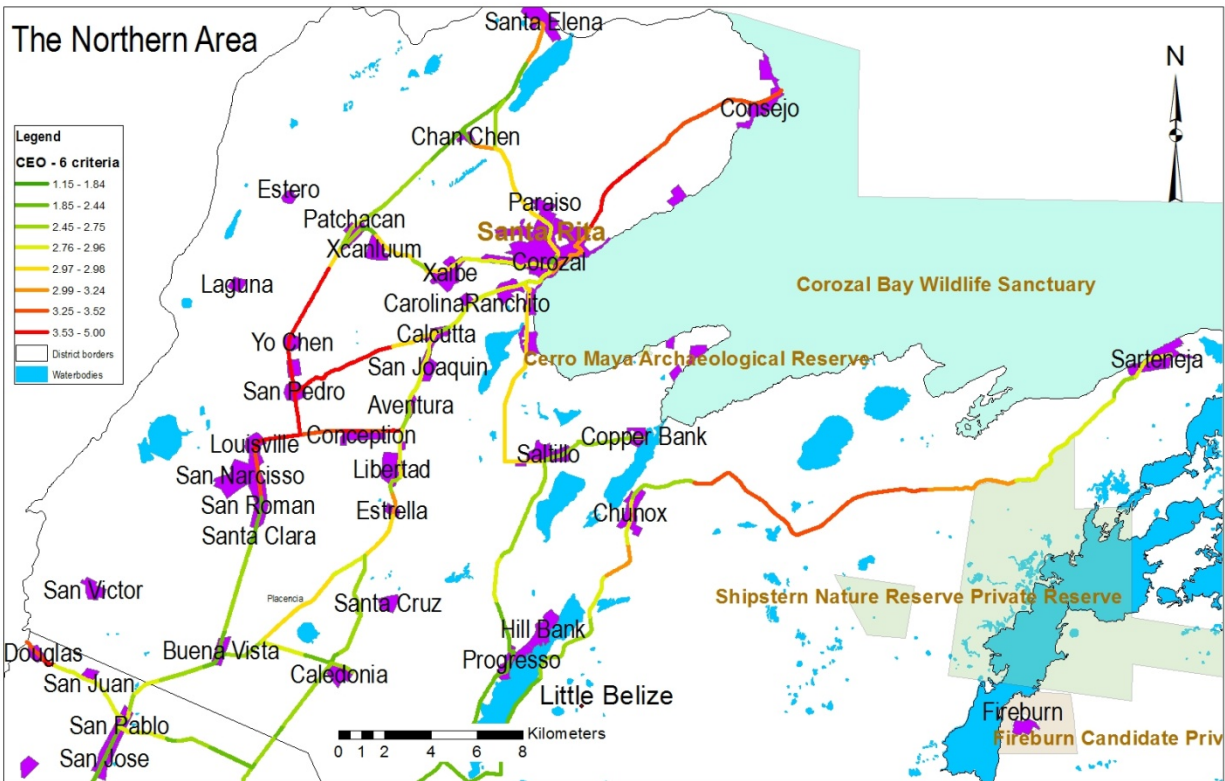
2.3.2.3. SPECIES WITH POTENTIAL TO BECOME NUISANCES, VECTORS OR DANGEROUS

No species with potential to become nuisances, vectors or dangerous are known to occur within the project area.

2.3.2.4. SENSITIVE HABITATS, INCLUDING PARKS OR PRESERVES, SIGNIFICANT NATURAL SITES, ETC.

Some sensitive natural habitats, protected areas, and significant natural sites that are situated adjacent to and/or within the project area include the Shipstern Nature Reserve, Corozal Bay Wildlife Sanctuary, and Santa Rita and Cerro Maya archaeological sites – see Figure 12.

Figure 12: Northern Area around Corozal Area showing protected areas



2.4. SOUTHERN AREA AROUND INDEPENDENCE

2.4.1. PHYSICAL ENVIRONMENT

The project area in the Southern Area around Independence is situated in the Stann Creek District and includes the Southern Highway from Santa Cruz (near the Placencia Junction to Bladen); the Trio Road; the Independence Road; and the road to Monkey River.

2.4.1.1. GEOLOGY AND SOILS

The Stann Creek District lies in the southern half of the country that is dominated by the Maya Mountains and the southern coastal plains¹⁰⁹. The project area is situated primarily in the southern coastal plains with its relatively flat landscape, covered with predominantly ferruginous sandy clay alluvial deposits³. The erosion of the Maya Mountains contributes most of the coastal soils to the coastal plains. Soils in the coastal plains and river valleys in the south are generally more fertile as they are derived, or associated with limestone parent materials¹¹⁰. Because part of the project area lies at the eastern foothill of the Maya Mountains, its geology in these parts would be characteristic of hilly, rugged, rolling limestone regions containing numerous sinkholes, caverns, and underground streams¹¹¹. The soils of the project area are indicative of nutrient poor, often coarse textured Acrisols, and Regosols found in unconsolidated coastal deposits supporting both mangrove communities and low scrubby associations (see

¹⁰⁹ McCloskey & Keller, 2009

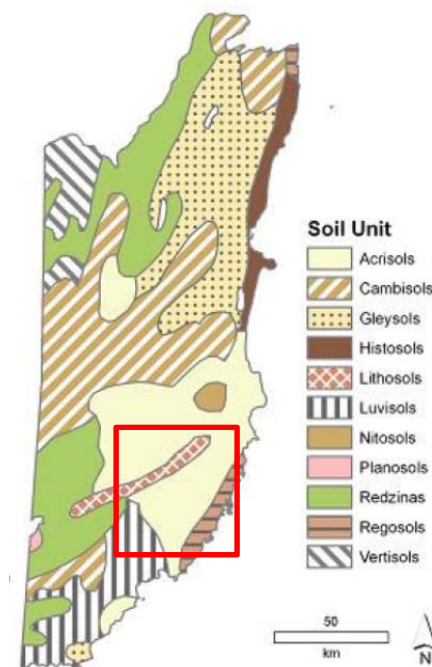
¹¹⁰ Flores, 1952

¹¹¹ Ministry of Natural Resources, Environment, and Industry, 2002

FINAL DRAFT

Figure 13)³⁷.

Figure 13: Map of Belize showing major soil units¹¹²



2.4.1.2. TOPOGRAPHY

The southern coastal plains within the project area are less than 200 feet (60 metres) above sea level and are drained by many major rivers and perennial streams¹¹³, including the South Stann Creek River, Bladen River, and Monkey River. The coastline is relatively flat and swampy, with many salt or brackish lagoons and the rivers crossing these coastal areas tend to be brackish in their lower reaches¹¹⁴. Westward from the southern coastal plains, the terrain changes from mangrove swamp to tropical pine savannah and hardwood forest¹¹⁵.

2.4.1.3. CLIMATE

Rainfall is generally less variable from year to year in the southern regions of the country where it averages about 160 inches¹¹⁶. The dry season is shorter in the south, normally only lasting from February to April. A shorter, less rainy period usually occurs in late July or August, after the initial onset of the rainy season.

Temperatures are generally influenced by elevation, proximity to the coast, and the moderating effects of the northeast trade winds off the Caribbean. The average temperature in Belize is

¹¹² Darwin Initiative. UK

¹¹³ Boles, 1999

¹¹⁴ Dixon, 1956

¹¹⁵ Merrill, 1992

¹¹⁶ National Meteorological Service, 2014

FINAL DRAFT

approximately 81 degrees Fahrenheit along the coast to 69 degrees Fahrenheit in the hills, with average highs of 85° and a mean low of 73°. The coldest month is January while the highest temperatures are experienced during the month of May¹¹⁷. The annual mean humidity is 81.1%. Temperatures are slightly higher inland, except for the southern highland plateaus, such as the Mountain Pine Ridge, where it is noticeably cooler year round.

Within the Southern Area around Independence, Hurricane Iris made landfall near Independence in 2001. Approximately 775,000 acres of forests and other ecosystems were severely affected by the storm's winds that downed, damaged, and defoliated many trees¹¹⁸.

2.4.1.4. AMBIENT AIR QUALITY AND EXISTING SOURCES OF AIR EMISSIONS

Air emissions sources within the project area include from aquaculture farms such as Belize Aquaculture Ltd., Crustaceans Ltd., and Aqua Mar Belize Ltd. Exhaust from vehicular traffic throughout¹¹⁹ and from the burning of savannas, agriculture fields, and garbage dumps in and around communities within the project area also contribute to air emissions⁷.

2.4.1.5. SURFACE AND GROUNDWATER HYDROLOGY

The Southern Area around Independence is located within the South Stann Creek, Monkey River, and some other minor coastal watersheds¹²⁰, and includes catchments from these two major rivers. A number of freshwater and brackish water streams, estuaries, rivulets, and wetlands also exist¹²¹. Groundwater is available throughout the area and is attributed to the areas high-permeability calcareous sediments and climatic conditions¹²². High concentrations of chloride are found along the coast due to tidal effects and saltwater intrusion from the Caribbean Sea¹²³. The occurrences of poor groundwater quality increase during the dry season when aquifer recharge is low¹²⁴.

¹¹⁷ National Meteorological Service, 2014.

¹¹⁸ Meerman, 2001

¹¹⁹ Land and Surveys Department, 2010

¹²⁰ Boles, 1999

¹²¹ Frutos, 2003

¹²² Ibid

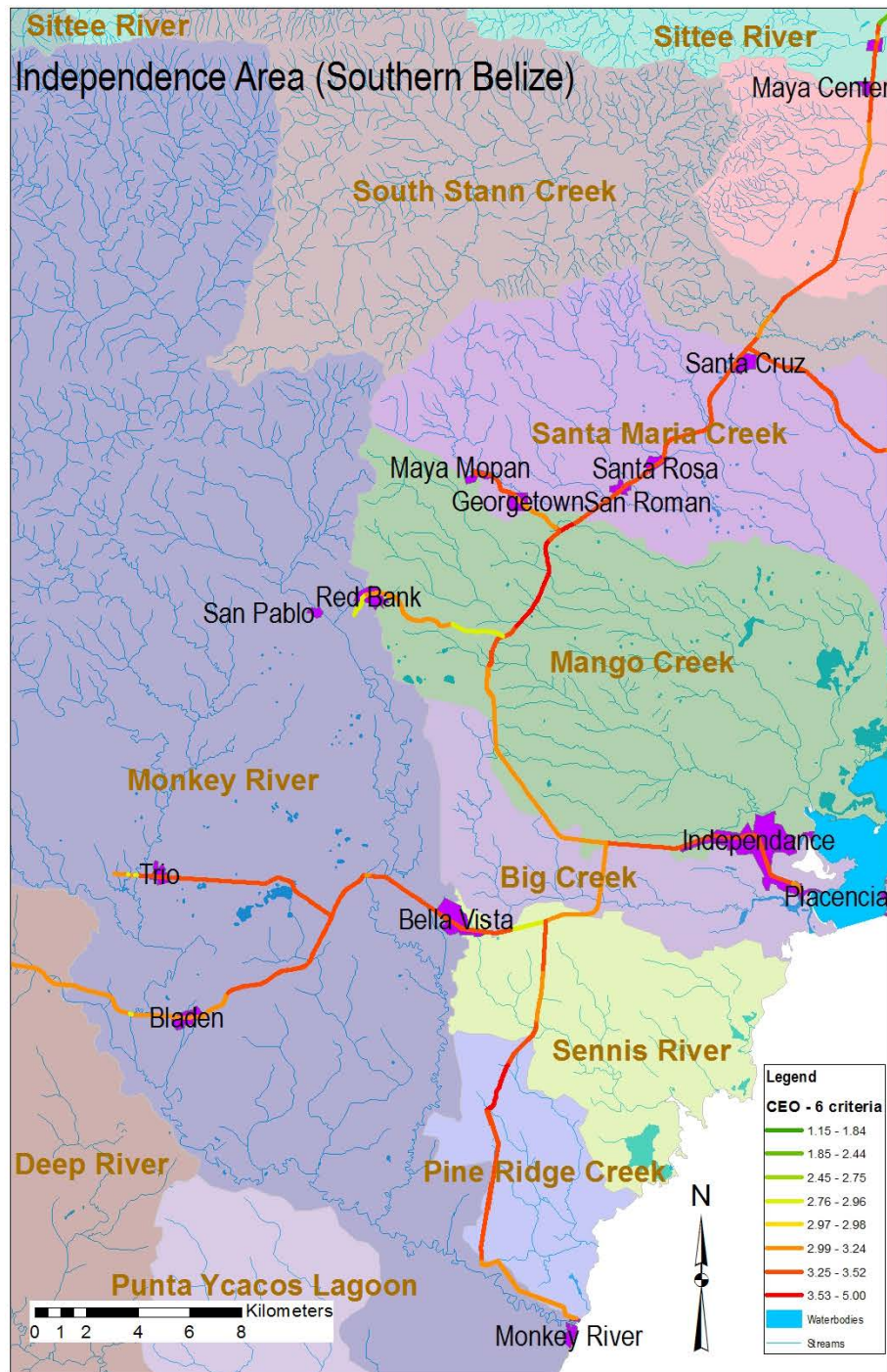
¹²³ Second National Communication: United Nations Framework Convention On Climate Change, 2011

¹²⁴ Medlin Jr., 2008

FINAL DRAFT

Figure 14 shows the sections of watersheds including the major rivers and waterways that are found within the Southern Area around Independence Area.

Figure 14: Map of Southern Area around Independence Area showing major watersheds



2.4.1.6. EXISTING WATER POLLUTION DISCHARGES AND WATER QUALITY

Within the project area, the contamination of the South Stann Creek, Monkey, Swasey, and Bladen Rivers, and other water sources are as a result of water pollution discharges from public

FINAL DRAFT

garbage dump in Independence and other neighbouring communities. These water resources also receive contaminants from wastewaters from clothes washing, bathing, and septic tanks and latrines from communities along these waterways¹²⁵.

Water pollution discharges within the project area also come from agricultural activities (including non-sustainable agriculture practices) and from the intensive cultivation of citrus and banana¹²⁶, and sand mining from communities along the South Stann Creek, Monkey, Swasey, and Bladen Rivers¹²⁷. Effluent from aquaculture farms such as Belize Aquaculture Ltd.; Crustaceans Ltd.; and Aqua Mar Belize Ltd.¹²⁸; and from mechanic shops, carpentry shops, corn tortilla shops, and many other small businesses contaminates portions of the South Stann Creek and Monkey River Watersheds.

Notably, a study by Alegria¹²⁹ indicated that land-based sources of pollutants (from garbage dumps, and the citrus, bananas and aquaculture farms) are affecting the rivers and other coastal waters of southern Belize.

2.4.2. BIOLOGICAL ENVIRONMENT

2.4.2.1. FLORA AND FAUNA

Within the Southern Area around Independence, forest cover is typically lowland broad-leaved forest, lowland savanna, shrubland, lowland pine forest, mangrove and littoral forest, and wetland¹³⁰. Within these ecosystem types a number of flora species can be found including Cohune Palm (*Attalea cohune*), Caribbean Pine (*Pinus caribaea*), *Senna undulata*, Gumbo Limbo (*Bursera simaruba*), *Brosimum guianense*, Large-leaved Mahogany (*Swietenia macrophylla*), Ironwood (*Dialium guianense*), Trumpet Tree (*Cecropia peltata*), Red Mangrove, and Yemeri (*Vochysia hondurensis*)¹³¹. Some fauna species that make these habitats their home include the Meso-American Slider (*Trachemys venusta venusta*), Indigo Snake (*Drymarchon corais*), Green Iguana (*Iguana iguana*), Brown basilisk (*Basiliscus vittatus*), Collared Peccary (*Pecari tajacu*), Mexican Porcupine (*Sphiggurus mexicanus*), Coatimundi (*Nasua narica*), and Central American Red Brocket Deer (*Mazama temama*)¹³². In addition, about 261 species of birds have been recorded within the project area¹³³, including the Roadside Hawk (*Buteo magirostris*), Red-lored Parrot (*Amazona autumnalis*), Bananaquit (*Coerreba flaveola*)¹³⁴,

¹²⁵ Land and Surveys Department, 2010

¹²⁶ Department of the Environment, 2014

¹²⁷ Karper & Boles, 2004

¹²⁸ Department of the Environment, 2014

¹²⁹ Alegria, 2009

¹³⁰ BERDS, 2014a

¹³¹ BERDS, 2014b

¹³² Ibid

¹³³ Miller & Miller, 1997

¹³⁴ Jones, 2003

FINAL DRAFT

Squirrel Cuckoo (*Piaya cayana*), Yellow-headed Parrot¹³⁵, and Laughing Falcon (*Herpetotheres cachinnans*).

2.4.2.2. RARE OR ENDANGERED SPECIES

The Yellow-headed Parrot is a rare or endangered species that occur within the project area¹³⁶.

2.4.2.3. SPECIES WITH POTENTIAL TO BECOME NUISANCES, VECTORS OR DANGEROUS

No species with potential to become nuisances, vectors or dangerous are known to occur within the project area.

2.4.2.4. SENSITIVE HABITATS, INCLUDING PARKS OR PRESERVES, SIGNIFICANT NATURAL SITES, ETC.

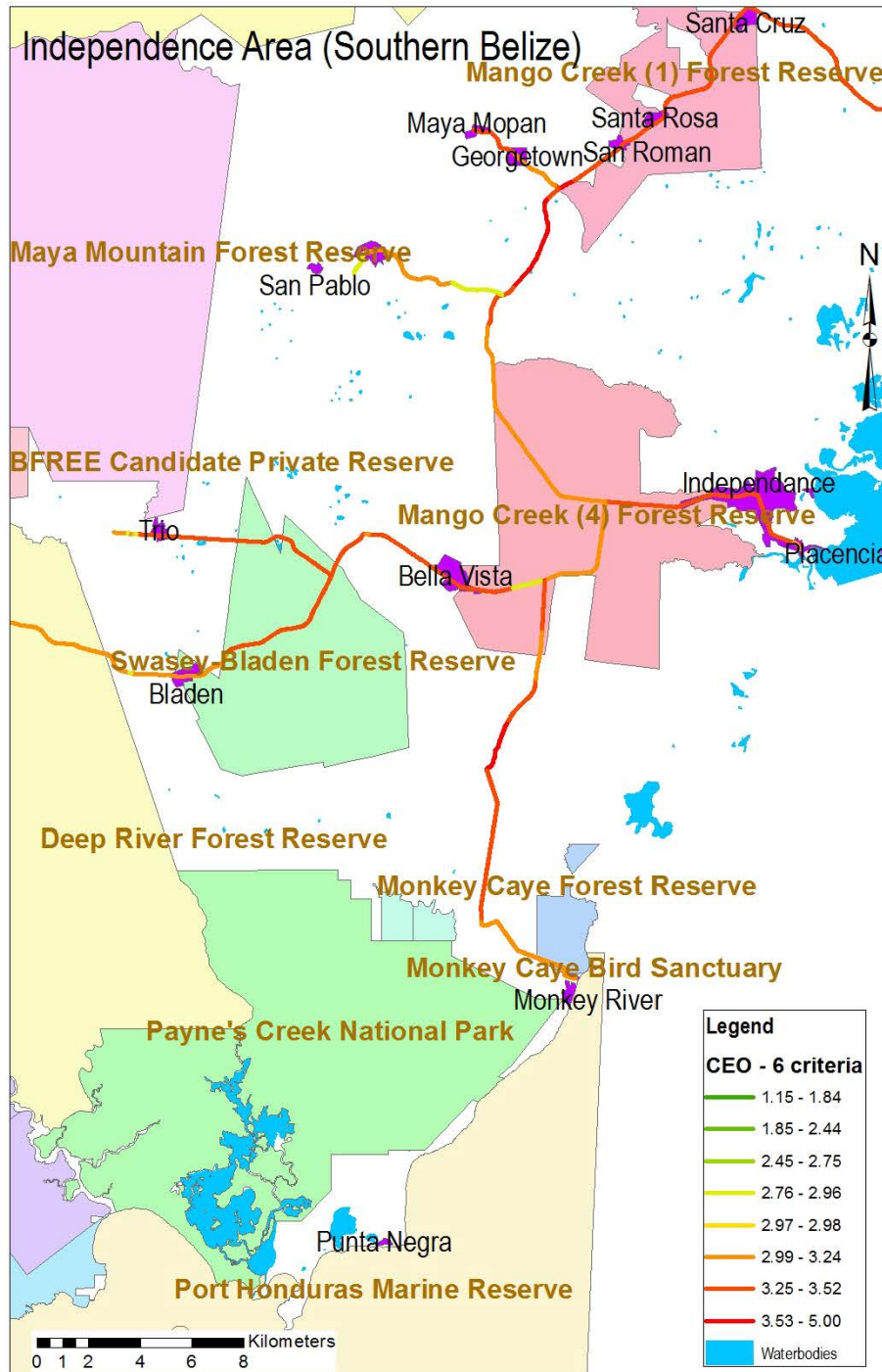
Some sensitive natural habitats, protected areas, and significant natural sites that are situated adjacent to and/or within the project area include: the Mango Creek 1 and Mango Creek 4 Forest Reserves, Swasey Bladen Forest Reserve, the Maya Mountain Forest Reserve, the Deep River Forest Reserve, and the Payne's Creek National Park – see

¹³⁵ Jones, 2003

¹³⁶ Meerman, 2005

Figure 15.

Figure 15: Southern Area around Independence Area showing protected areas



3. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The Government of Belize, through the Ministry of Forests, Fisheries and Sustainable Development (MFFSD) and the Ministry of Natural Resources and Agriculture (MNRA), employs a number of guidelines (standards) and tools to safeguard Belize’s environment from impacts associated with the varied socioeconomic development practices/projects in country. The aim is to foster prudent use and proper management of the country’s natural resources through preservation, protection and improvement of the environment and the control of pollution. Some of the guidelines/tools that relates to the BCRIP include: environmental checklist and environmental impact assessment (EIA) in which project developers are asked to map out all environmental impacts of a potential project prior to project implementation phase so as to ensure that practical measures to mitigate adverse environmental effects are adequately addressed beforehand. Another key tool used by the Belize government is an environmental compliance plan (ECP), which helps to ensure compliance during project implementation and throughout the project timeframe. SIF will work closely with the varied government permitting entities mentioned herein to ensure that BCRIP subprojects comply with these national environmental standards and guidelines. This EMF also takes into account the World Bank’s safeguard policies that have been triggered under this project.

3.1. THE WORLD BANK SAFEGUARD POLICIES

During project preparation, five environmental Safeguard Policies have been triggered for the Belize Climate Resilient Infrastructure Project (BCRIP). These policies include Environmental Assessment, Natural Habitats, Physical Cultural Resources, and Projects in Disputed Areas. These policies will be applied to ensure that project funds are engaged in a manner consistent with Bank institutional policies with respect to environmental protection and management.

The Bank’s Environmental Safeguard Policies pursue three objectives: a) to assure that environmental aspects are evaluated in the decision making process; b) to reduce and to handle the risks of a programme or project; and c) to provide mechanisms for consultation and information disclosure regarding project activities to interested and affected parties.

SIF will adopt the World Bank Environmental Safeguard Policies in order to assure the environmental sustainability of BCRIP subprojects and assume compliance and monitoring responsibility.

3.1.1. OP/BP 4.01 – ENVIRONMENTAL ASSESSMENT (EA)

This policy is triggered if a project is likely to have potential (adverse) environmental risks and impacts in its areas of influence. OP 4.01 covers impacts on the natural environment (air, water and land); human health and safety; physical cultural resources; and trans-boundary and global environment concerns. This project has been classified as Category B and environmental assessments are required during preparation of the sub-projects. According to the Policy, a Project is classified as Category B if:

FINAL DRAFT

“Its potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of a Category A Environmental Assessment (EA). As in a Category A project, the EA examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

3.1.2. OP/BP 4.04 – NATURAL HABITATS

This safeguard seeks to support the protection and rehabilitation of natural habitats associated with Bank-financed projects. The Natural Habitats Policy is triggered by any project with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project). Natural habitats are land and water areas where most of the original native plant and animal species are still present. Natural habitats comprise many types of terrestrial, freshwater, coastal, and marine ecosystems. They include areas lightly modified by human activities, but retaining their ecological functions and most native species.

The Natural Habitats Policy distinguishes between critical and other natural habitats.

Critical natural habitats are those natural habitats which are either: (i) legally protected, (ii) officially proposed for protection, or (iii) unprotected but of known high conservation. Bank-supported projects must avoid significant conversion or degradation of any critical natural habitats. The environmental assessment process (OP 4.01) should identify any critical natural habitats within a proposed project's area of influence. For other (non-critical) natural habitats, the Natural Habitats Policy requires avoiding or minimizing damage to natural habitats to the extent feasible. If significant conversion or degradation of a non-critical natural habitat is needed to achieve a project's key objectives, the project must include mitigation measures acceptable to the Bank.

The policy also states that, “wherever feasible, Bank-financed projects are sited on lands already converted (excluding any lands that in the Bank's opinion were converted in anticipation of the project). The Bank does not support projects involving the significant conversion of natural habitats unless there are no feasible alternatives for the project and its siting, and comprehensive analysis demonstrates that overall benefits from the project substantially outweigh the environmental costs.”

The BCRIP subprojects will not affect or degrade any natural habitats because the civil works for the infrastructural sub-projects will be undertaken along existing roads, and will not traverse critical natural habitats or Protected Areas or Reserves. Therefore, none of the proposed works would result in significant degradation or conversion of natural habitats. Nevertheless, all

FINAL DRAFT

construction sites will be rehabilitated and re-vegetated with native shrubs and trees. The BCRIP will also include safety measures (such as speed bumps and speed limit signs) in areas that are densely populated, near schools, or in the vicinity of protected areas and reserves. This safeguard is triggered based on the possibility that activities may affect natural habitats and the related management measures to ensure rehabilitation of these areas.

In addition, species of particular conservation concern such as the Jaguar and Baird's Tapir require large areas of natural habitat for their survival and can be reasonably expected to occasionally cross roads and highways in the four project locations. The endangered Yellow-headed Parrot may also be seen as it flies over two of the project locations encompassed in its sizeable Belize home range. The endangered Central American River Turtle (Hicatee)¹³⁷ occurs mainly in large rivers and freshwater lagoons in Belize, and is more abundant in the Belize River, and thus likely to occur in project locations that the Belize River traverses.

3.1.3. OP/BP 4.11 – PHYSICAL CULTURAL RESOURCES

This policy is intended to avoid or mitigate adverse impacts on physical cultural resources from development projects financed by the World Bank. Physical cultural resources are defined (under this policy) as “movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above ground, underground, or under water. Their cultural interest may be at the local, provincial or national level, or within the international community.”

The assessment and mitigation is done through the Environmental Assessment Process. This Policy is applied to the project as a precautionary measure in case cultural resources are encountered as part of the environmental assessment process or during civil works.

The BCRIP subprojects will not cause adverse impacts on known physical cultural resources because the civil works for the infrastructural sub-projects will be undertaken along existing roads. Any adverse impacts on physical cultural resources would have already been caused prior to the BCRIP. Nevertheless, chance finds procedures should be incorporated into all sub-project EMPs and civil works contracts. See Annex 3 for proposed chance find procedures wording.

3.1.4. OP 7.60 – PROJECTS IN DISPUTED AREAS

The territory of Belize has been claimed in whole or in part by Guatemala since 1940. In May 2008, Belize and Guatemala signaled their acceptance of the OAS Secretary General's recommendation to refer the territorial dispute to the International Court of Justice subject to the will of the people of Belize and Guatemala. On the 8 December 2008, the Ministers of Foreign Affairs of Belize and of the Republic of Guatemala signed the “Special Agreement to Submit Guatemala's Territorial, Insular and Maritime Claim to the International Court of Justice”

¹³⁷ The Hicatee is both a species of conservation concern and of economic importance (as a source of protein). It is endangered in Belize and under IUCN, and listed on CITES Appendix II.

FINAL DRAFT

subject to the conduct of national referenda in both countries. Up to now, the referenda have not been conducted.

As a result of the existence of Guatemala's claim to Belizean territory, this policy is triggered as a precautionary measure.

By supporting the BCRIP, the Bank does not intend to make any judgment on the legal or other status of the territories concerned or to prejudice the final determination of the competing parties' claims.

3.1.5. REQUIREMENTS FOR PUBLIC DISCLOSURE

The final version of the EMF will be publicly disclosed in Belize and published on the WB's external website, after consultations are held on the document, and concerns incorporated into the EMF.

3.2. BELIZE NATIONAL LAWS AND REGULATIONS

The Belize Climate Resilient Infrastructure Project implementation will need to comply with the national legal framework of Belize. In Belize, protection of the environment from degradation is primarily the responsibility of the Department of the Environment (DOE) under the portfolio of the Ministry of Forests, Fisheries and Sustainable Development (MFFSD). Notwithstanding this, environmental protection also lies within the purview of other agencies. The Forest Department has responsibility for protection of terrestrial ecosystems generally and provides management oversight through the issuance of licensing, monitoring and enforcement of the pertinent local laws. The Geology and Petroleum Department is legally tasked with oversight for dredging, mining and oil exploration activities.

The BCRIP subprojects will abide by the relevant laws, guidelines and licensing processes of each of these Government of Belize agencies and those of others that are required. Table 1 shows the main national legal instruments that are applicable to this project, and relates them to the relevant World Bank Environmental Safeguard Policies.

Table 1: Main national legal instruments

Name of Act	Date	Relevance	Relevant World Bank OP
Environmental Protection Act and EIA Regulations	Rev 2000	Control and prevention of pollution on land, water and air, prohibitions on dumping of waste, environmental impact assessment and the control of nutrients deposited into the environment	OP 4.01
National Integrated Water Resources Act	2011	Management, controlled allocation and the sustainable	OP 4.01

FINAL DRAFT

			use and protection of the water resources of Belize.	
National Institute for Culture & History Act	Rev 2000		Protection and conservation of ancient monuments and related matters.	OP 4.11
National Parks System Act	1982 (Rev 2000)		Allows for the designation of national parks, wildlife sanctuaries, natural monument, and nature reserves.	OP 4.04
Wildlife Protection Act	1982 (Rev 2000)		Protection for species of conservation concern.	OP 4.04
Public Roads Act	Rev 2000		Authorizes the Chief Engineer to throw upon any lands adjacent or near thereto such earth, rubbish or materials as it shall or may be necessary to remove from the place of any work related to surveying, tracing, measuring, opening, constructing, repairing, altering, diverting, clearing, improving and excavating of any public road.	OP 4.01
Mines & Minerals Act	1989 (Rev 2000)		Controls activities such as dredging, prospecting and drilling.	OP 4.014
Macal River Hydroelectric Act	2003		Authorized the design, financing, construction and operation of the Chalillo Project.	OP 4.37
Land Utilization Act	Rev 1990		Provides for measures to govern use and development of land, and introduces measures for conservation of land and watersheds.	OP 4.01 and OP 4.04

3.2.1. ENVIRONMENTAL LAW

The **Environmental Protection Act**¹³⁸ (EPA) is the most comprehensive piece of environmental legislation in Belize. The law demonstrates, as stated in the preamble, the commitment of the Government of Belize (GOB) to the protection and preservation of Belize's natural heritage to ensure that exploitation of the resources is consistent with maintaining ecological balance. The Act gives broad sweeping powers to the Department of the Environment (DOE) for the control and prevention of pollution on land, water and air, prohibitions on dumping of waste, environmental impact assessment and the control of nutrients deposited into the environment.

¹³⁸ <http://www.doe.gov.bz/documents/legislation/cap328.pdf>

FINAL DRAFT

Environmental Impact Assessment (EIA) Regulations were adopted in 1995 as subsidiary to the EPA. Part V of the EPA is devoted entirely to Environmental Impact Assessments (EIA)¹³⁹ (Annex 2). These Regulations outline criteria for environmental impact, define significant environmental issues, and stipulate the minimum content of an EIA. Of major significance in the EIA Regulations are two schedules: one which categorizes projects for which EIA is mandatory, and the other that stipulates those projects that must undergo a screening process to determine whether an EIA is necessary. Also stipulated are those projects for which an EIA is not required.

The EPA also has a subsidiary regulation for effluent discharge into the environment¹⁴⁰. The EPA stipulates that any person intending to undertake any project, programme or activity which may significantly affect the environment shall cause an EIA to be carried by a suitably qualified person and submitted to the DOE for evaluation and recommendation.

Once a project proposal is submitted to the DOE a screening exercise is undertaken to determine the level of environmental assessment necessary. The regulation categorizes projects in three schedules. It is mandatory that an EIA be developed for proposals that fall under “Schedule I” of the regulations. These are usually project that will have significant negative long term impacts and cause irreversible damage on the biophysical environment. Proposals that fall under “Schedule II” are at the discretion of the DOE in the determination of the level of assessment necessary, and they are essentially different from Schedule 1 proposals in terms of size only. The third is where the magnitude of the project impacts is minimal and does not fit into the “Schedule I or II” projects. To ensure that no major assessment will be necessary and for certainty, it is strongly recommended by DOE that a letter be submitted to them indicating the programme, project, undertaking or activities so that they can screen and issue environmental clearance if necessary.

As a Category B project under World Bank classification, screening is required for all sub-projects, and the preparation of EMPs and in some cases, possibly more comprehensive EAs, will be required for each sub-project.

Under the EIA regulations, the DOE can apply different levels of environmental assessment to determine the likely environmental impacts of a proposed development. They may require an EIA which is the highest level of assessment, or a Limited Level Environmental Study (LLES). For those projects that do not require either the EIA or LLES, immediate environmental clearance is granted without any studies requested. Once the project requires a study, applicants must follow the procedures outlined in the EIA regulations and guidelines (DOE, 2011). LLES studies are usually required for Schedule II proposals. In the case of an EIA, all impacts are evaluated and a public consultation is mandatory while for a LLES only likely impacts identified by the DOE are assessed and a public consultation is discretionary. The third study (Schedule III) is undertaken for proposals that have low or insignificant environmental impacts but may warrant that conditions be placed on the developer to ensure that the development of the project

¹³⁹ <http://www.doe.gov.bz/documents/legislation/328sEIARegulations.pdf>

¹⁴⁰ <http://www.doe.gov.bz/documents/legislation/328sEffluentRegulations.pdf>

FINAL DRAFT

do not go beyond the proposal and do not require an EIA or Limited Level Environmental Study (LLES).

If the DOE determines that an EIA or LLES is required then a screening phase is followed by a scoping phase which determines the focus area of the study in conformity with guidelines set out in the regulations. Following this the preparer is given permission to conduct the EIA or LLES. Upon completion and approval by the DOE the report can proceed to full submission to DOE. A National Environmental Appraisal Committee (NEAC) reviews the reports and makes recommendations to the DOE on the merits and demerits. DOE is responsible for issuing a final approval or disapproval. The NEAC is made of a cross sector of technical professionals that are called upon based on the nature of the project to give their recommendations to the DOE.

Once the studies are completed and approved by DOE, an Environmental Compliance Plan (ECP) is developed by the Department. The ECP is a legally binding agreement between the DOE and the developer. It outlines what should be done after the environmental assessment is approved in terms of mitigation and monitoring necessary for environmental protection. Breach of the ECP or EPA can lead to penalties that include revoking of the development license, fines and or confinement to the local prison.

The EPA lists the areas that the EIA should evaluate, including effects on humans, flora and fauna, water, soil, air, ecological balance, among others. The EIA is required to include measures that should be undertaken to mitigate any adverse environmental effects, and statement of reasonable alternatives and justification for their rejection. Further, the EPA makes provision for the development of regulations prescribing procedures, guidelines, and the types of projects for which an EIA may be required. The EPA also mandates the involvement of the public in the EIA process.

The DOE is also responsible for enforcement of the Effluent Limitation Regulation¹⁴¹, which stipulates procedures for censuring discharges of effluent into inland waters or the marine environment.

The DOE developed a **Procedures Manual for the Preparation of an EIA in Belize** (DOE, July 2011), which is a legislative document that outlines the various statutory provisions governing the granting of permission for development. It sets out the legal and institutional framework within which applications for planning and development permissions are determined, and identifies the general objectives of planning for development in Belize.

In 2011 the Government of Belize (GOB) enacted the **National Integrated Water Resources Act** which will require much support in the implementation of its objectives. This law provides for the management, controlled allocation and the sustainable use and protection of the water resources of Belize. It also provides for the establishment of a National Integrated Water Resources Authority to coordinate and assist in regulating the water sector.

¹⁴¹ <http://www.doe.gov.bz/documents/legislation/328sEffluentRegulations.pdf>

FINAL DRAFT

The **Land Utilization Act** (Chapter 188 of the Substantive Laws of Belize, Revised Edition 2000) established the Land Subdivision and Utilization Authority. This Authority is responsible for overall land use planning in the country of Belize. The Act provides for measures to govern use and development of land, introduces measures for conservation of land and watersheds, and empowers the Minister responsible to make regulations for demarcation of areas, water catchment areas or watersheds and prohibition of clearing of vegetation within these areas, among other provisions.

3.2.2. NATURAL HABITAT LAW

The Forest Department has the responsibility for administering five pieces of legislation. The **Forest Act** Chapter 213 of the Laws of Belize provide for the protection and preservation of trees, forest products as it relates to felling of trees, grazing of cattle, hunting, shooting, clearing for cultivation, burning lime or charcoal, collecting and removing forest products. One may also be required to consult with other important local legislation or convention from time to time.

Also mandated under the Forest Act is Protection of Mangrove Regulations (SI 52 of 1989, under revision), which provide for the protection of mangroves, with restrictions on mangrove alteration and/or clearance. Before granting a permit for mangrove alteration, Belize law requires the Forest Department to consider whether the project will adversely affect the conservation of the area's wildlife, water flow, erosion and values of marine productivity, and to find either 'that the proposed alteration will not significantly lower or change water quality' or that the degradation of water quality is in the "larger and long-term interest of the people of Belize" (Forest Act). Under the Forest Act, forest reserves can be declared.

The **National Parks System Act** (revised 2000) is the most comprehensive law for protected areas and allows for the designation of national parks, wildlife sanctuaries, natural monument, and nature reserves. The various categories of protected areas allow for varying uses of the different categories. In addition to the existing protected areas, a number of other areas have been proposed for declaration and for all practical purposes are considered within the system of protected areas.

The **Wildlife Protection Act** (SI 12 of 1982, revised 2000) also falls under the Forest Department, and provides protection for species of conservation concern, with the regulation of hunting and commercial extraction of wildlife species.

The **Mines and Minerals Act** (1989) and the **Petroleum Act** (1991), under the Department of Geology and Petroleum, regulate the exploration and extraction of all non-renewable resources, including oil. These Acts also control activities such as dredging, prospecting and drilling which have the potential to impact the environment.

The **Public Roads Act** Chapter 232 of the Laws of Belize (2000) includes a provision that seems contrary to the environmental laws. Specifically, Section 16 of the Act authorizes the Chief Engineer to throw rubbish upon adjacent lands as follows: "In the surveying, tracing, measuring, opening, constructing, repairing, altering, diverting, clearing, improving and excavating of any

FINAL DRAFT

public road, the Chief Engineer may throw upon any lands adjacent or near thereto such earth, rubbish or materials as it shall or may be necessary to remove from the place of any such work.”

3.2.3. PHYSICAL CULTURAL RESOURCES LAW

The **National Institute for Culture and History (NICH) Act** makes provision with respect to the protection and conservation of ancient monuments and related matters. All ancient monuments and antiquities, whether upon any land or in any river, stream or watercourse, or under territorial waters of the country should not be destroyed and no person shall possess or have in custody any ancient monument or antiquity except under a license granted by the relevant Minister. BCRIP subprojects that are determined to have an impact on ancient monuments and antiquities will not be allowed. The relevant sections of the NICH Act to the BCRIP are as follows:

- Section 61.-(1) Subject to subsection (2), no person shall remove any earth or stone from any ancient monument except under a permit in the prescribed form issued by the Director.
- Section 61.-(2) This section shall not apply to any person or group of persons holding a permit granted by the Director under section 49 in so far as they transfer debris or spoil within the specified land as part of their operations.
- Section 61.-(3) Any person who contravenes subsection (1) commits an offence and is liable on summary conviction to a fine not exceeding one thousand dollars or to imprisonment for a term not exceeding twelve months, or to both such fine and term of imprisonment.
- Section 62.-(1) Subject to the provisions of this Act, any person who: (a) willfully damages, destroys or disturbs any ancient monument or in any way marks or defaces any ancient monument; or (b) willfully removes any antiquity from any ancient monument or destroys any such antiquity, commits of an offence.
- Section 62.-(2) Any person who willfully causes or induces or attempts to cause or induce any other person to commit an offence under this Part or who knowingly aids and abets any other person in the commission of any such offence also commits an offence.
- Section 63.-(1) The Director may direct any land owner, lessee, concessionaire, contractor or any other person who is about to engage in any operation which in the opinion of the Director is liable to destroy, damage, interfere with or otherwise be to the detriment of any ancient monument or antiquity: (a) not to proceed with any operation until the Director shall have had an archaeological exploration and survey carried out; and (b) to take or to refrain or desist from taking any such action as part of the operation as the Director may decide to be fair and reasonable for the proper protection of the ancient monument or antiquity.
- Section 63.-(2) Any person who contravenes any direction in writing of the Director under subsection (1) commits an offence and is liable on summary conviction to a fine not exceeding ten thousand dollars or to imprisonment for a term not exceeding five years, or to both such fine and term of imprisonment.

FINAL DRAFT

According to the NICH Act “ancient monument” means “any structure or building erected by man or any natural feature transformed or worked by man, or the remains or any part thereof, whether upon any land or in any river, stream or watercourse or under the territorial waters of Belize, that has been in existence for one hundred years or more”. “Antiquity” means any article manufactured or worked by man, whether of stone, pottery, metal, wood, glass, or any other substance, or any part thereof: (i) the manufacture or workmanship of which belongs to the Maya civilization, being of an age of one hundred years or more; or (ii) the manufacture or workmanship of which belongs to a civilization other than the Maya civilization, being an article which is of an age of one hundred years or more”.

The **Public Roads Act** Chapter 232 of the Laws of Belize (2000) includes some relevant provisions that are aligned with provisions of the NICH Act. Specifically, Section 18 of the Public Roads Act states that: “In the execution of any of the works mentioned in this Act, it shall not be lawful for the Chief Engineer or for any other person acting as his agent to dig, cut, excavate, or in any way disturb any mound of ancient origin or construction of like character, or to remove or carry away any spoil, earth or stone therefrom unless he has previously been granted a permit to do so by the Archaeological Commissioner.” Section 19 of the Act stipulates that: “Subject to the provisions of the [NICH] Act, the rights of ownership to any relic discovered in the course of the execution of any works mentioned in this Act on any private land or on land which has been taken and appropriated for the purpose of a public road are hereby reserved to the owner of such land.”

3.3. BELIZE ENVIRONMENTAL STRATEGIES

Environmental Strategy	Purpose
National Biodiversity Strategy and Action Plan	Provides a framework and guide for the implementation of actions necessary for Belize to conserve and sustainably use its biological resources. The strategy addresses the threats to biodiversity, including deforestation, legislation, and community participation and involvement.
National Protected Areas Policy and System Plan	A plan and policy for the establishment and management of Belize’s protected areas system.
Belize National Environmental Action Plan	An overview of the major environmental issues facing Belize and prudent use and management of natural resources.
National Biological Corridors Program Strategy	Focuses on promoting alternative land uses within proposed corridor routes that are compatible with sustaining and enhancing biodiversity in the long run, while being able to accommodate the present and future developmental needs of Belizeans.
Belize National Forest Policy	Addresses forest sector issues such as overexploitation of timber and non-timber species, community participation in forest management, and the need for improved forest governance.
National Integrated Coastal Zone Management Strategy for Belize	To facilitate improved management of coastal resources in Belize and to ensure that economic growth is balanced with sound environmental management in Belize’s coastal zone.

Horizon 2030	A long-term development framework for Belize that addresses national development.
Belize Climate Change Adaptation Policy	Prepares all sectors of Belize to meet the challenges of global climate change; promote the development of economic incentives, which encourage investment in public and private sector adaptation measures; develop Belize’s negotiating position on climate change at the regional and international levels to promote its economic and environmental interests; and foster the development of appropriate institutional systems for planning and responding to global climate change.
National Integrated Water Resources Management Policy for Belize	Sets goals and objectives for the management of water resources at the national scale and includes policies for regions, catchments, shared or trans-boundary water resources, and inter-basins transfers. It addresses both the quantity and quality aspects of both surface and groundwater resources and also deals with the delivery of water services.

3.4. INTERNATIONAL CONVENTIONS AND AGREEMENTS

In addition to the local environmental mechanisms in place, over the past fifty years Belize has signed a number of international conventions aimed at protecting the environment in ways that are both nationally and globally important. These international environmental conventions and agreements focus on addressing the global and local human impact on the environment; conservation and appropriate use of wetlands and their resources; conservation, sustainability, and equally and fairly shared benefits of biological diversity; the formulation of pragmatic solutions to the most pressing environment and development challenges; climate change, protection of the world cultural and natural heritage; plant protection, regulation of whaling; law of the sea; and trade of endangered species

These agreements listed must be kept in mind when evaluating any sub-project. Table 1Table 2 is a list of the known conventions and agreements that have been signed and may affect project implementation. These Conventions and Agreements also promote the use of best practices that function as additional environmental safeguards.

Table 2: Relevant international conventions & agreements

International Conventions and Regional Agreements	Ratified	Purpose
International Convention for the Protection and Conservation of Sea Turtles for the Western Hemisphere	1997	To promote the protection, conservation and recovery of sea turtle population and the habitats on which they depend
Alliance for the Sustainable Development of Central America	1994	Regional alliance supporting sustainable development initiatives
Convention on Biological Diversity	1993	To conserve biological diversity to promote the sustainable use of its components, and encourage equitable sharing of benefits arising from the utilization of natural resources
Convention on the Conservation of	1992	To conserve biological diversity and the

FINAL DRAFT

International Conventions and Regional Agreements	Ratified	Purpose
Biodiversity and the Protection of Priority Wilderness Areas in Central America		biological resources of the Central American region by means of sustainable development
United Nations Framework Convention on Climate Change	1992	An overall framework for intergovernmental efforts to tackle the challenge posed by climate change. It recognizes that the climate system is a shared resource whose stability can be affected by industrial and other emissions of carbon dioxide and other greenhouse gases
UNESCO Man and the Biosphere Programme	1990	To promote the sustainable use and conservation of biological diversity and for the improvement of the relationship between people and their environment globally, through encouraging interdisciplinary research, demonstration and training in natural resource management
Central American Commission for Environment and Development	1989	Regional organizations of Heads of State formed under ALIDES, responsible for the environment of Central America. Initiated Mesoamerican Biological Corridors and Mesoamerican Caribbean Coral Reef Programs
Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region	1983	To protect the marine environment of the wider Caribbean region for the benefit and enjoyment of present and future generations
United Nations Convention on the Laws of the SEA	1983	A legal order for the seas and oceans which will facilitate international communication, and will promote the peaceful uses of the seas and oceans, the equitable and efficient utilization of their resources, the conservation of their living resources, and the study, protection and preservation of the marine environment
Convention on the Conservation of Migratory Species of Wild Animals	1979	To protect migratory species
Convention on the Protection of Archaeological, Historical and Artistic Heritage of American Nations	1976	To protect the Archaeological heritage of signatory countries. Several Maya Archaeological sites exist, four of which have been identified during the Maya Mountain Project - including the second largest site in Southern Belize
Convention on International Trade in Endangered Species of Wild Fauna and Flora	1973	To ensure that international trade in specimens of wild animals and plants does not threaten their survival
Convention Concerning the Protection of the World Cultural and Heritage	1972	To encourage the identification, protection and preservation of cultural and natural heritage around the world considered to be of outstanding value to humanity
Convention on Wetlands of	1971	To stem the progressive encroachment on and

International Conventions and Regional Agreements	Ratified	Purpose
International Importance		loss of wetlands now and in the future, recognizing the fundamental ecological function of wetlands and their economic, cultural, scientific and recreational value
International Planet Protection Convention	1951	To promote the protection, conservation and recovery of sea turtle population and the habitats on which they depend

4. ENVIRONMENTAL PERMITS AND REQUIREMENTS

4.1. APPLICATION OF LOCAL ENVIRONMENTAL INSTRUMENTS AND SAFEGUARDS

Environmentally responsible development should consider direct and indirect impacts, cumulative impacts, identification of practices that will protect the environment throughout the project cycle (during and after implementation, and operation), and preparation of an environmental monitoring programme.

4.1.1. IMPACT IDENTIFICATION, ASSESSMENT AND EA PROCESS

Impact identification and environmental assessments should include all relevant technical guidelines. This is to facilitate early identification of environmental issues, incorporate environmental safeguards. Environmental studies can be properly focused through the aid of technical guidelines. In identification of impacts it is important that all projects are screened to ensure compliance with the local environmental and World Bank protection measures. To ensure that this occurs all proposed projects must complete the Project Environmental Screening Form (PESF) developed (see Section 6.1.1 and Annex 7 – Part B of Format for EMP). The intention is to provide a standard format for initial screening of all subprojects to ensure that an assessment of environmental impacts is undertaken and mitigation measures proposed.

Properly identifying the impacts that a project will have on the environment is critical to plan for an adequate mitigation response. The impact identification matrix will provide the platform on which all impacts will be assessed to ensure that they will be equally quantified across subprojects. All proposed activities shall be vetted using the procedures set out in this EMF. Assurance will be given to the project implementers that the project has been properly screened. There are three main objectives in utilizing this methodology (see Section 4.2.2. below):

- There is a high probability of the same outcome from different appraisers.
- The process is reliable and accurate.
- There is traceability in determining the impact.

The impact identification matrix consists of four levels of consequences and likelihood of those consequences occurring. By corresponding the consequence with the likelihood, three levels of preliminary impacts can be determined: significant, medium and low (see Section 4.2.1. below).

FINAL DRAFT

For example, level of risk is determined at the point where the consequence and likelihood of it occurring intersect.

4.2. METHODOLOGY AND INSTRUMENTS

4.2.1. ENVIRONMENTAL CATEGORIZATION

The environmental impacts of the subprojects differ based on their size or magnitude, and the specific subproject location's surrounding sensitivity with regard to environmental aspects. The categorization will thus classify the subprojects in terms of the environmental risk level (Category) which could be: (B) Moderate risk, or (C) Low risk. Category A sub-projects are not included in the BCRIP. Based on the scope of the investment work and the location of the sub-projects, there is very little likelihood of such high-risk projects.

As part of the Environment Guide developed for the BCRIP, projects are categorized according to three distinct categories: (1) Category 1 (or Schedule I) for those requiring full EIA; (2) Category 2 (or Schedule II) for those that should undergo a screening process to determine the level of assessment necessary; and (3) Category 3 for those projects that do not require EIA (Annex 4). All sub-projects involving any type of civil works will require at least an EMP (World Bank requirement) and a Limited Level Environmental Study (Belize DOE requirement). Each project listed under the various project types is evaluated based on its potential negative impact, and cross-checked with the EIA Regulations (Environmental Protection Act) Schedules.

According to the EIA (Amendment) Regulations (2007), an EIA is required for Schedule I projects such as:

- Major waterworks such as alteration of riverbanks and shoreline, alteration of groundwater, diversion of water courses, and modification of stream flows.
- The construction of **new national highways**, and other roads of more than 10 miles in length.
- Any proposed development project, undertaking or activity within any protected area.

Schedule II projects would require only an LLES depending on the location or size of the projects, such as:

- The construction of a road less than 2000 meters in length;
- Canalization or flood relief works; or
- Any activity involving stream alterations or diversions.

BCRIP subprojects will not require a full EIA but would require an LLES, based on consultations with the DOE. All of the subprojects will require a screening process to define the environmental risk level and the studies required. In this case it is important, after the categorization using the table defined is completed by the SIF, to analyze this result crossing the variable of the environmental site sensitivity for the World Bank Safeguards that are triggered.

FINAL DRAFT

The following presents the methodology to include the analysis during the categorization process:

4.2.2. SITE SENSITIVITY AND ENVIRONMENTAL CATEGORIZATION

To determine the level of the site sensitivity (high, moderate or low) where the subproject will be located, the checklist presented below should be used. This checklist includes some aspects related to safeguards issues.

Table 3: Site sensitivity

Sensitivity	Description	Checkmark (✓)
HIGH	National Park or Protected Area – MFFSD	
	High Index of biodiversity	
	High degree of threat – CITES	
	High degree of endemism – CITES	
	High danger of environmental degradation (deforestation, hunting, others.)	
	Vulnerable Zones to natural disasters (floods, earthquake, other)	
	Sensitive or critical ecosystems (wetlands, mangrove swamps, primary or secondary forests, other) - MFFSD	
	Zones recognized as indigenous groups area or vulnerable populations in the direct area of influence of the project	
	Presence of places of highly cultural and historical interest in the direct influence area	
MODERATE	Proximity to Protected Areas – MFFSD	
	Moderate index for biodiversity	
	Moderate degree of threat – CITES	
	Moderate degree of endemism – CITES	
	Moderate danger of environmental degradation (deforestation, hunting, others.)	
	Wavy topography (15 to 35% of slope) related to improvement of new construction of roads	
	Moderate risk to natural disasters (floods, earthquake, others)	
	Zones recognized as indigenous groups area or vulnerable populations in the indirect area of the project	
	Presence of places of highly cultural and	

FINAL DRAFT

	historical interest in the indirect influence area	
LOW	Intervened areas out of national parks or protected areas zones	
	Low biodiversity degree	
	Low degree of threat– CITES	
	Low degree of endemism – CITES	
	Low danger of environmental degradation (deforestation, hunting, etc.)	
	Vegetation intervened	
	Zones with low risk to natural disasters (floods, earthquake, other)	
	Absence of sites with cultural and historic value	
	Absence of indigenous groups	

If at least one setting is high, the site sensitivity of the entire subproject is **HIGH**; if no setting is in high sensitivity but at least one setting is in moderate, the site sensitivity is **MODERATE**; and if there is no high and/or moderate setting, the site sensitivity is **LOW**.

The final environmental categorization will be the result of overlaying or crossing the preliminary Categorization and the site sensitivity. To arrive at this result, one should apply the following matrix:

Table 4: Environmental categorization matrix

Project Grade	Site Sensitivity		
	High	Moderate	Low
1	A	A	A
2	A	B	B
3	B	B	C

Category A: Those projects with high potential environmental risk, because the work area of influence presents high level of sensibility and the subprojects are of such a magnitude that can alter the natural environment, biodiversity, the economic organization and cultural property.

Category B: Those projects with moderate potential environmental risk, because the project area of influence presents moderate level of sensitivity, nevertheless the civil works are less complex. The environmental impacts are easily identifiable and mitigated.

Category C: Those projects with low potential environmental risk. The natural environment, the biodiversity, the population and the cultural property are not at risk. Nevertheless, standard environmental mitigation measures related to construction will be undertaken (covering air, noise, dust, and water pollution measures; disposal of construction waste: PPE: road safety measures, etc).

Category A projects will be excluded from this Project.

5. ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The project is designed to contribute to strengthening the resilience of critical infrastructure to natural hazards and the anticipated impacts of climate variability through targeted retrofitting, rehabilitation and reconstruction activities. Only existing primary and secondary roadways identified in project locations will be used. The contemplated nature of works under the project include hydrological improvements that may include small-scale creek alignment, straightening of ox-bows, cut-and-fill, retaining walls along embankments, sizing of culverts to manage water flow better along the primary and secondary road networks, some replacement of culverts with small bridges; as well as road rehabilitation, road widening and shoulder improvement.

The anticipated negative impacts and their mitigation measures include:

5.1. NOISE DURING CONSTRUCTION

Some noise will be produced by vehicle traffic and work equipment. Noise disturbs wildlife and can affect the hearing of people in work areas. Belize currently only has guidelines for noise abatement on premises (see

FINAL DRAFT

Table 5) and not for noise emissions into the ambient environment. These guidelines can nevertheless be used given that some civil works will be close to residential or commercial areas.

In addition, sound level limits specified for the Mile 24 GPH Sanitary Landfill operations could be adapted for the road works as well. For this site, sound level limits at a point of reception located 500 feet from the source is 45 dBA in any hour of the night (7:00pm – 7:00am), and 55 dBA in any hour of the day (7:00 am – 7:00 pm).

The following measures can thus be observed to comply with the standards for noise abatement on premises and the Sanitary Landfill to mitigate the impact of noise on the outdoor environment that will be caused from road work activities:

- Maintain equipment and work vehicles in proper running order, and ensure that they have the adequate muffling devices installed.
- Restrict work activities to the daytime, and where necessary, minimize work during the nighttime.
- Work personnel should wear hearing protection.

Table 5: Noise Level According to the dB Scale¹⁴²

Duration of the Noise	Structure A		Structure B		Structure C		Structure D		Structure E	
	D	N	D	N	D	N	D	N	D	N
1. More than 9 hrs	60		60		70		70		85	
2. More than 3 hrs, less than 9 hrs	70		70		75		75		90	
3. More than 30 mins	75		75		80		80		100	
4. More than 30 mins		45		45		45		45		90
5. More than 15 mins and less than 1 hr	70		70		90		90		105	
6. More than 10 mins and less than 30 mins		45		50		50		50		90
7. More than 5 mins and less than 15 mins	70		85		100		90		90	
8. More than 2 mins and less than 5 mins	90		95		100		100		95	
9. Less than 10 mins		50		70		70		70		80
10. Less than 2 mins	100		100		105		100		110	
Noise from infrequent (less than 4 times per week) explosions	109		109		114		114		114	
D = Day										
N = Night										
Structure A: any building used as a hospital, convalescent home, old age home, or school.										
Structure B: any residential building.										
Structure C: any building in an area that is used for residential and one or more of the following purposes: commerce, small scale production, entertainment.										
Structure D: any residential apartment in an area that is used for the purposes of industry, commerce or small scale production.										
Structure E: any building used for the purposes of industry, commerce, or small scale production in an area used for the purposes of industry, commerce, or small scale production.										

5.2. DUST AND AIR EMISSIONS DURING CONSTRUCTION

Dust and air emissions will be produced mainly from operation of equipment and vehicular traffic. Rocks and sand used in road works might contain asbestos and silica that are released into the environment. Some air emissions of volatile organic compounds (VOCs) will also occur from the heated asphalt. Air emissions from the asphalt will be short-term and should be reduced over time through the actions of compaction and weathering. Dust and air emissions can affect vegetation and human health.

The impact of dust and other air emissions into the environment can be mitigated through:

- Watering work area during noticeable dry periods.

¹⁴² As defined by the International Electronics Commission. Source: Modified from Belize Environmental Protection Act, Revised Edition, 2003.

FINAL DRAFT

- Keeping material in small stockpiles and keep stockpiles watered periodically.
- Prohibit burning of any construction waste.
- In dusty environments, personnel should wear respirators.
- Maintain equipment in proper running order and ensure that they have adequate muffler devices installed.
- Work personnel should wear respirators in dusty environments and where volatile organic compounds are more concentrated.

5.3. WILDLIFE DISTURBANCE DURING CONSTRUCTION

Where road construction activities are near obvious bird congregation areas, low level disturbance to colonies can occur. Wildlife can also be affected by transient noise from workers' activities and machinery, and from artificial night light sources. In areas where wildlife such as Baird's Tapir, Jaguar, and Gray-necked Wood-Rail are known to cross the road, collisions with vehicles could increase due to over-speeding. It has been observed that newly upgraded road might induce motorists to increase their speed. Wildlife may also be affected by domesticated animals being introduced into previously undisturbed wildlife habitat, or fences erected on the side of the road, or matter placed upon the road by the Chief Engineer or his work men in carrying out road works.

The following measures can be implemented to reduce disturbances to wildlife:

- At bird congregation wetland areas, widen shoulders on both sides of the road (if adequate shoulder for vehicle parking is not already available) and incorporate a simple but properly designed wildlife observation station (see

FINAL DRAFT

- Figure 16 and Figure 17), which could be maintained and/or monitored by an environmental NGO like the Belize Audubon Society, that manages the Crooked Tree Wildlife Sanctuary (a wetlands protected area that is one of two Ramsar sites in Belize).
- Place wildlife crossing signs at key crossing points.
- Place speed bumps (see
- Figure 18 and

FINAL DRAFT

- Figure 19) or other speed reduction or traffic calming measures at key crossing points and in the vicinity of protected areas.

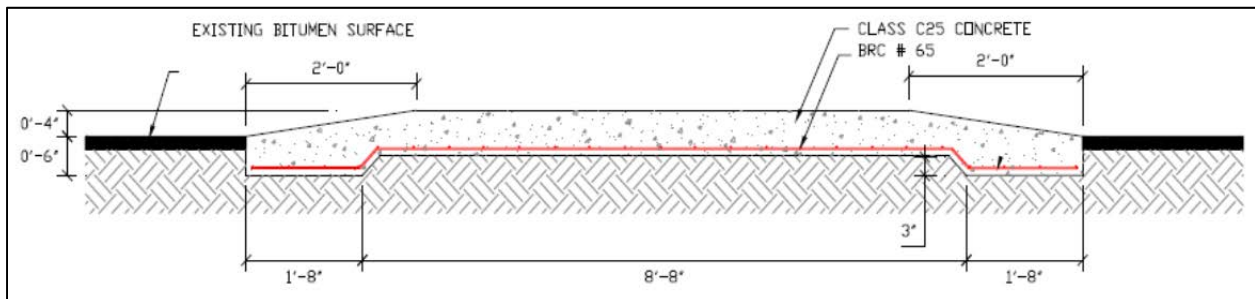
Figure 16: Simple Bird Observation Platform¹⁴³



Figure 17: Simple Bird Observation Platform¹⁴⁴



Figure 18: Typical sections through speed bump¹⁴⁵

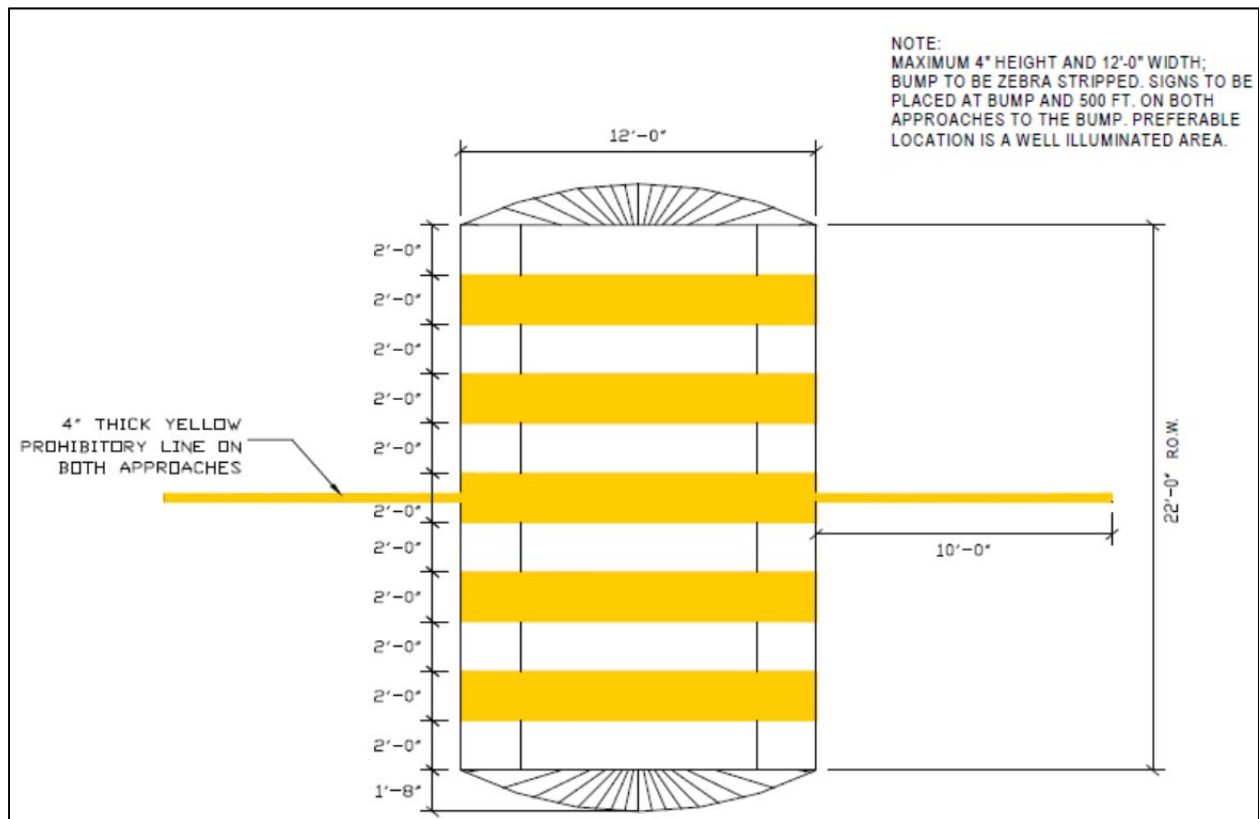


¹⁴³ Source: www.caribbeanbirdingtrail.org

¹⁴⁴ Source: www.managingenterprisecontent.com

¹⁴⁵ Ministry of Works. (1999). Manual of Standards and Q.C.

Figure 19: Plan of speed bump¹⁴⁶



5.4. POLLUTION OF SOIL, GROUNDWATER, AND WATERWAYS DURING CONSTRUCTION

Soil, groundwater, and surface waters can be polluted by the hydrocarbon compounds in asphalt. Asphalt may contain polycyclic aromatic hydrocarbons, phenols, styrene, and hydrogen sulfide. In addition, kerosene may be used and blended with the asphalt to make it more liquid.

According to the Ministry of Works Manual of Standards and Q.C., asphalt is used for prime coating, pre-coatings, and as a sealing binder for first and second coat surface treatments. Surface waters can also be polluted by sediment runoff from exposed soil, road material, and construction debris. Pollution of these environments can affect vegetation and wildlife.

The following measures can be considered to minimize the risks of pollution of soil and water:

- Adequately protect adjacent non-sprayed surface such as concrete curbs, channels, and other concrete structures from asphalt overspray during paving.
- Minimize stockpiles of construction debris near waterways.
- Compact paved surface as soon as possible to minimize leaching of asphalt components.

¹⁴⁶ Ministry of Works. (1999). Manual of Standards and Q.C.

FINAL DRAFT

5.5. SPILLAGE OF FUEL AND LUBRICANTS DURING CONSTRUCTION

Work vehicles and equipment can spill engine oil and lubricants at the work area and cause contamination of soil and water. Contaminants can affect vegetation and wildlife. Spilled waste oil and cleanup materials will need to be disposed of properly.

The following measures can be considered to minimize the risks of contamination:

- Maintain equipment in proper running order.
- Use absorbent material to contain spills when fueling and servicing equipment and work vehicles.
- Transfer all clean-up material to an appropriate disposal site.

5.6. CONSTRUCTION WASTE

Some construction waste will be produced; and earth, rubbish, or material may be thrown upon lands adjacent to project roads by order of the Chief Engineer. These wastes need to be managed and disposed of properly to avoid affecting wildlife and pollution of soil and water.

Measures to mitigate negative impacts of construction waste could include:

- Minimize stockpile of construction waste.
- Place waste away from drainage systems.
- Remove and dispose of waste material from work sites as soon as possible, without being detrimental to environmental or human health and safety.

5.7. MANAGEMENT OF VEGETATION AND SOIL DEBRIS DURING CONSTRUCTION

Road work activities will remove vegetation and soil that will need to be stored, discarded or used in a manner that will minimize erosion and rehabilitation of the construction area. Where adjacent habitats have been cleared or altered to create temporary roads by order of the Chief Engineer, site rehabilitation will be necessary.

The following measures can be considered to minimize erosion and impacts to habitats:

- Minimize removal of vegetation to areas where it is absolutely necessary.
- Re-vegetate areas where possible to prevent soil exposure.
- Slopes and drainage systems (see Figure 20 and Figure 21) should be constructed at the recommended angle to prevent collapse.
- Avoid earthworks and monitor areas of exposed soil during periods of heavy rainfall.
- Minimize material and waste debris stockpiles and locate away from drainage systems.
- Remove vegetative debris from site as soon as possible.

Figure 20: Typical section of "V" drain¹⁴⁷

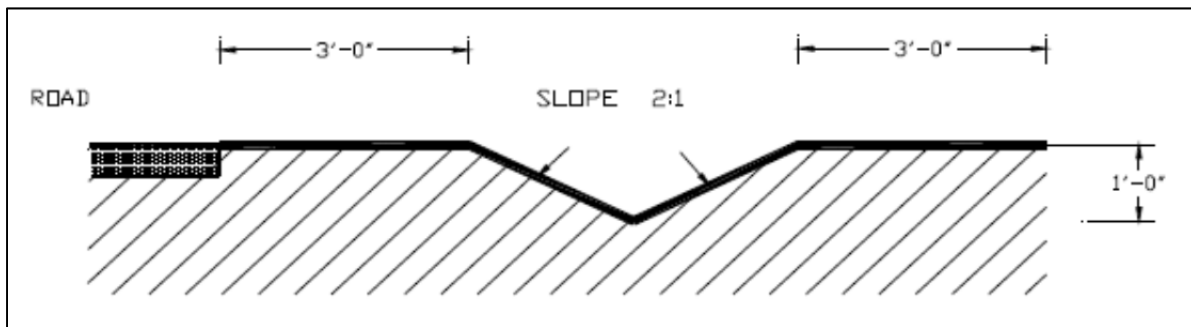
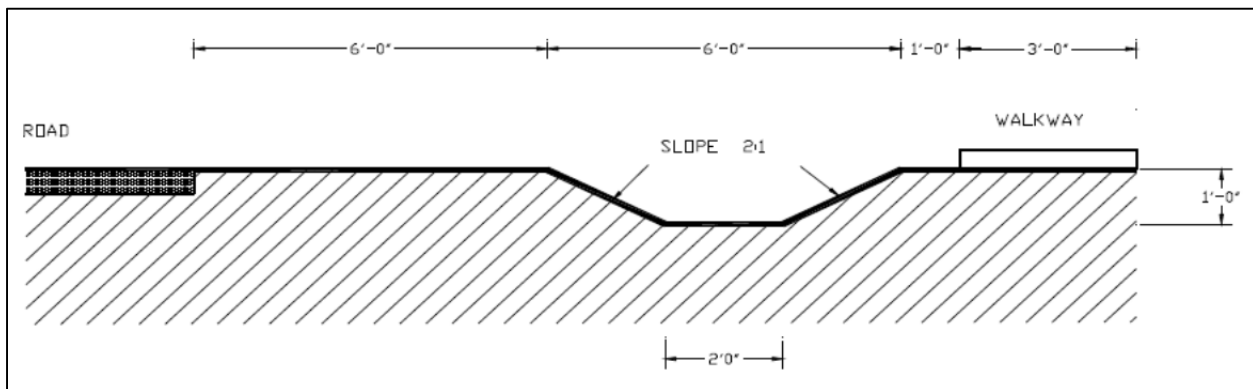


Figure 21: Typical section of trapezoidal drain¹⁴⁸



5.8. VEGETATION CLEARING DURING MAINTENANCE

The widening of roads, shoulder improvement, and maintenance of road reserves will require clearance of vegetation (see Table 6). Clearance of vegetation may increase artificial edges that can affect species, reduce wildlife habitats, and create wider gaps at wildlife crossing points. The Ministry of Works maintains vegetation on road shoulders to below 12 inches, and from the longitudinal drains to the edge of the right-of-way to less than 3 feet. Vegetation on road shoulders, bridge approaches, underneath passes, mile posts, culvert heads, and curves, and around road furniture are controlled by manual (machete) or mechanical means (bush-hogging) to the edge of the right-of-way (see Figure 22, Figure 23, and

¹⁴⁷ Ministry of Works. (1999). Manual of Standards and Q.C.

¹⁴⁸ Ibid.

FINAL DRAFT

Figure 24). The Chief Engineer may also order the removal of any tree, branch, bush, shrub, or vegetation that overhangs or obstructs any public road or river.

Some measures to minimize impacts from vegetation clearing include:

- Avoid burning cut vegetation. According to the Belize Forests Act, it is unlawful for any person to set fire to any grass, vegetation, undergrowth, tree or other object from which fire is likely to spread.
- Vegetative debris should be removed from work sites as soon as possible.
- Minimize removal of vegetation near wildlife crossing points and restrict removal of vegetation to areas where it is absolutely necessary.
- Use mechanical and manual methods of removal only.
- Vegetative debris should be located away from drainage systems.

Table 6: Ministry of Works road service requirements¹⁴⁹

Type of road access	Minimum Dimensions	Road surfacing requirements (MoW standards)	Drainage, culverts, and other constructions (MoW standards)
Primary roads	100 feet (30m) wide - 30 feet running surface (15 m buffer zone) 16 feet Utility corridor (for BTL, BEL, BWS lines)	Double surface dressing	Use “V” drain type for low volumes of water and these should have slopes up to 7:1, depth up to 3.0 feet, and width up to 42.0 feet. Use Trapezoidal drains for high volume of water and these should have slopes 1 ½ to 3:1, bottom width 2.0 – 4.0 feet, depth 1.0 – 3.0 feet, and top width from 5.0 – 7.0 feet.
Secondary road	60 feet (18m) wide with 20 feet shoulders	Double surface dressing	“V” drain

5.9. WORKMEN’S CAMPS AND SETTLEMENTS

Workers in camps and settlements will be inclined to impact surrounding natural areas by lighting campfires that could get out control. There is also the possibility of workers engaging in hunting for subsistence whenever they are off-duty. These activities could potentially affect and disturb, and alter vegetation through burning. In such cases, some site rehabilitation would be necessary.

The following measures can be considered to minimize impacts to wildlife and habitats:

¹⁴⁹ Modified from Land and Surveys Department. (2010). National Guidelines for Subdivision and Consolidation of Land in Belize.

FINAL DRAFT

- Place “Prohibited Activities” signs at all workers settlements. “Prohibited Activities” include hunting, lighting of campfires, and harvesting of forest products.
- Site rehabilitation.
- Minimize camp and settlement size.
- Minimize clearance of vegetation and earthworks.
- Minimize waste.

Figure 22: MOW design specifications for utility corridor¹⁵⁰

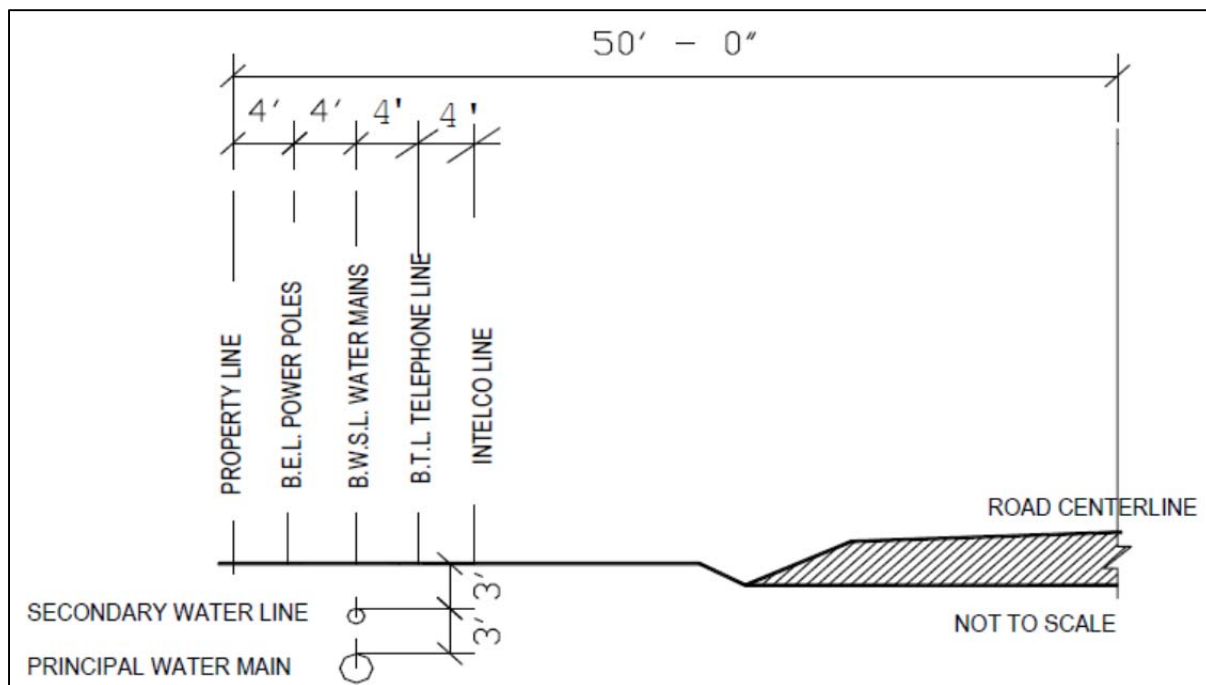


Figure 23: Typical cross section of 66 feet right-of-way¹⁵¹

¹⁵⁰ Ministry of Works. (1999). Manual of Standards and Q.C.

¹⁵¹ Ibid.

FINAL DRAFT

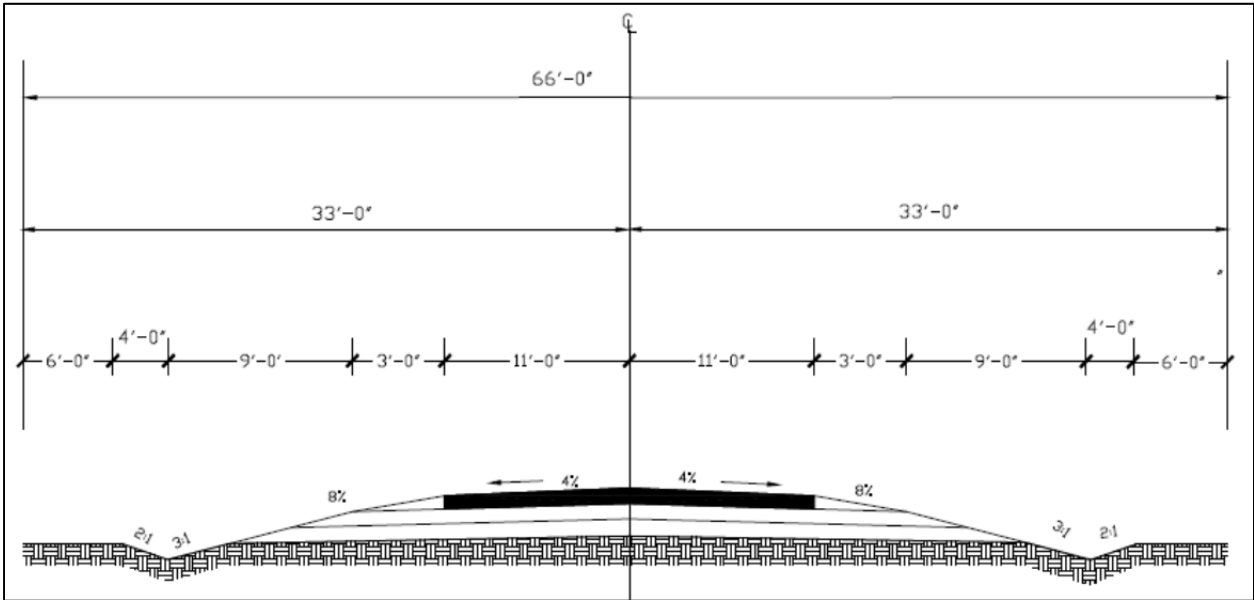
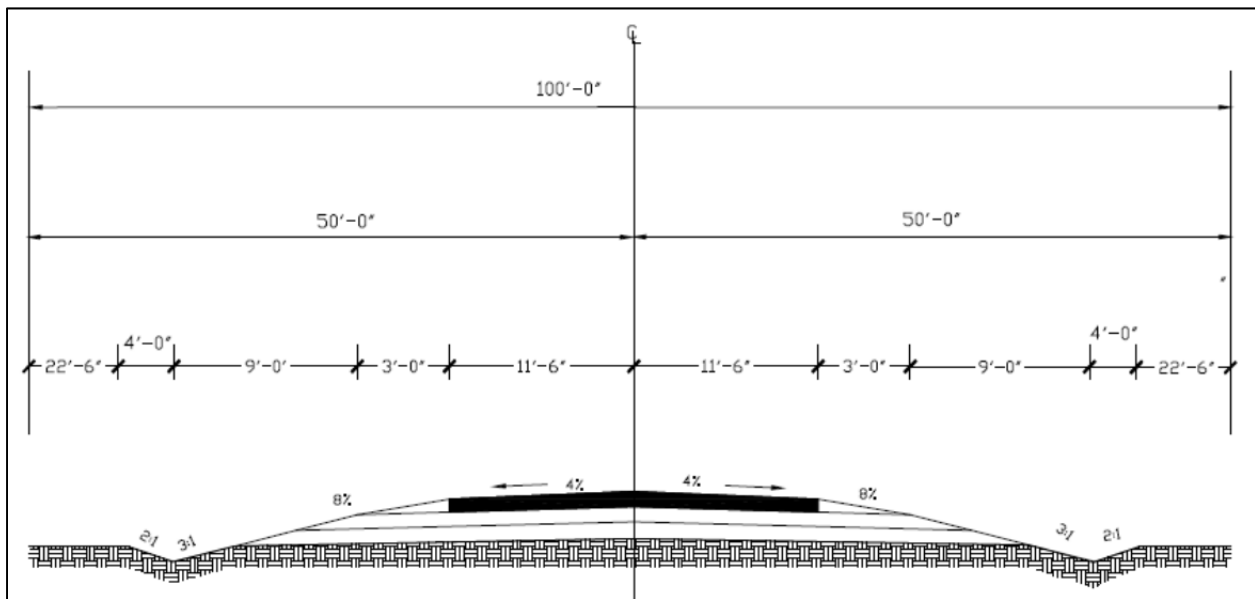


Figure 24: Typical cross section of 100 feet right-of-way¹⁵²



5.10. WATERWAYS DURING CONSTRUCTION

Hydrological improvements may cause alteration of water courses and siltation of streams and rivers that can affect wildlife such as the endangered Central American River Turtle (Hicatee). In addition, poor drainage of water channels may result in water stagnation and consequently promote the rapid growth of the Water Hyacinth resulting in further obstruction of water flow. Some site rehabilitation will be necessary.

The following measures can be implemented to reduce this impact:

- Minimize removal of soil from banks during work along waterways.
- Minimize material and waste debris stockpiles and locate away from drainage systems.
- Keep drain systems clean – manual removal of Water Hyacinth where necessary.
- Encourage re-vegetation in areas where possible to prevent soil exposure.
- Ensure culverts, bridges, and retaining walls along embankments are properly constructed – see

¹⁵² Ministry of Works. (1999). Manual of Standards and Q.C.

FINAL DRAFT

- Figure 25, Figure 26, and
- Figure 27.

Figure 25: Culvert headwall plan¹⁵³

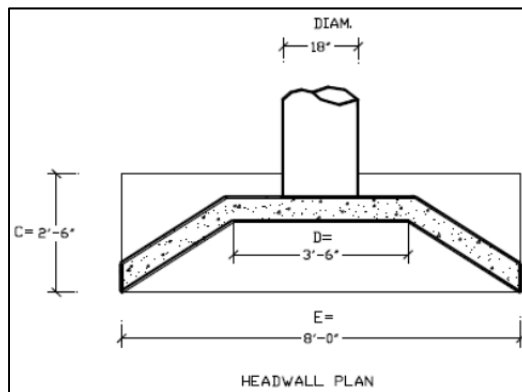


Figure 26: Culvert headwall section¹⁵⁴

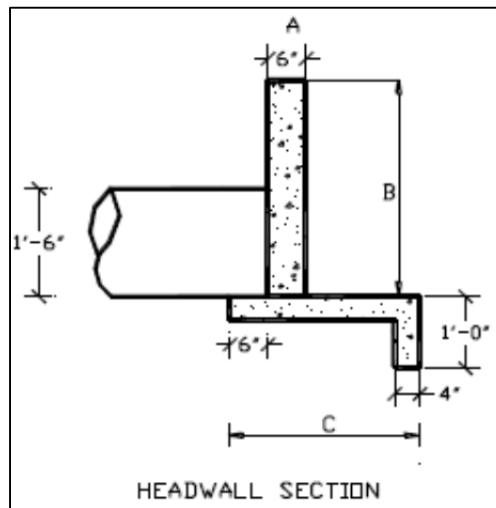
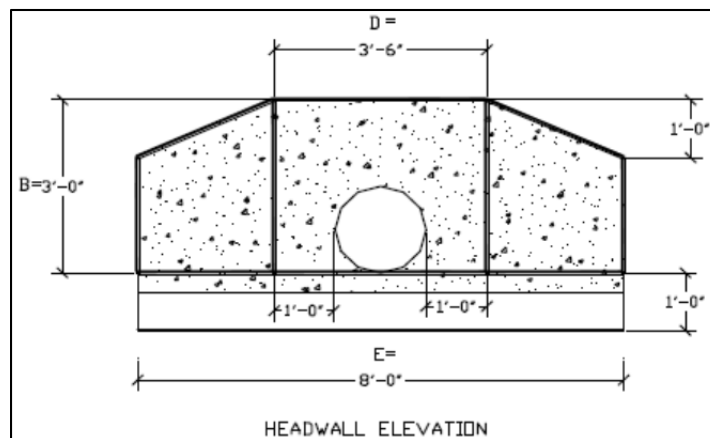


Figure 27: Culvert headwall elevation¹⁵⁵



¹⁵³ Land and Surveys Department. (2010). National Guidelines for Subdivision and Consolidation of Land in Belize.
¹⁵⁴ Ibid.
¹⁵⁵ Ibid.

FINAL DRAFT

5.11. TRAFFIC DIVERSION DURING CONSTRUCTION

During road works, the Minister on advice of the Chief Engineer may close, divert, or turn a portion of the road. In so doing, wildlife may be affected through habitat reduction and alteration, and some siltation of waterways may result. In such cases, some site rehabilitation will be necessary.

The following measures can be implemented to reduce this impact:

- Minimize removal of vegetation to areas where it is absolutely necessary.
- Encourage re-vegetation in areas where possible to prevent soil exposure.
- Avoid earthworks during periods of heavy rainfall.
- Minimize material and waste debris stockpiles and locate away from drainage systems.
- Remove vegetative debris from site as soon as possible.

5.12. RESIDUAL NEGATIVE IMPACTS THAT CANNOT BE MITIGATED

Road width reserves for primary and secondary roads are set out in established guidelines for the Belize transportation network by the Ministry of Works and therefore cannot be mitigated.

5.13. OPPORTUNITIES FOR ENVIRONMENTAL ENHANCEMENT

The outcome of the project will result in opportunities for environmental enhancement such as:

- Speed bumps at wildlife crossing points, and near sensitive habitats and protected areas.
- Reduction of wildlife mortality caused by vehicles. The reduction of wildlife mortalities may be construed as the natural environment being enhanced because impacts to natural wildlife populations would be minimized.
- Observation stations at bird congregation areas. This is a form of environmental enhancement because it means that more people would get to observe wildlife and thus develop an appreciation for wildlife and will want to protect wildlife overall.
- Hydrological improvements such as bridges, culverts, and retaining walls.

5.14. EXTENT AND QUALITY OF AVAILABLE DATA, KEY DATA GAPS, AND UNCERTAINTIES ASSOCIATED WITH PREDICTIONS

Relevant data for the project locations has been fairly sufficient and reliable, despite Belize's acknowledged shortfall in key research areas such as in the bio-physical environments. Key technical reports for internationally funded road building projects in Belize, carried out by international companies such as Halcrow International Consultants and Beca International Consultants, have not been obtained from the Ministry of Works' Project Execution Unit.

6. ENVIRONMENTAL MANAGEMENT PROCESS AND SCREENING PROCEDURES

6.1. ENVIRONMENTAL IMPACT ASSESSMENT

EIA Regulations were adopted in 1995 as subsidiary to the EPA. Part V, of Belize’s Environmental Protection Act (EPA) is devoted entirely to Environmental Impact Assessments (EIA). The EPA stipulates that any person intending to undertake any project, programme or activity which may significantly affect the environment shall cause an EIA to be carried out by a suitably qualified person to be submitted to the Department of Environment (DOE) for evaluation and recommendation.

The EPA lists the areas that the EIA should evaluate, including effects on humans, flora and fauna, water, soil, air, ecological balance, among others. The EIA is required to include measures that should be undertaken to mitigate any adverse environmental effects, and statement of reasonable alternatives and justification for their rejection. Further, the EPA makes provision for the development of regulations prescribing procedures, guidelines, and the types of projects for which an EIA may be required. The EPA also mandates the involvement of the public in the EIA process.

All “Category A” subprojects require an Environmental Impact Assessment (EIA). As stated before, the BCRIP subprojects do not require this type of studies/processes. Subprojects, however, fall within Schedule II of the EIA Regulations, making them subject to some level of assessment to be determined by the DOE. In this regard, there needs to be a mechanism for the subprojects to receive environmental clearance.

Annex 2 presents the “General Principles of Environmental Impact Assessment in Belize” that include among others: a) Approach to EIA; b) Steps in the EIA process (project description, screening, scoping, description of the environment, determination of impact, mitigation measures, alternatives, monitoring and evaluation, and documentation and reporting); and c) the Review Process and the role of the NEAC.

6.1.1. ENVIRONMENTAL CLEARANCE PROCESS

Prior to obtaining environmental clearance to a particular development project, potential developers are required by law to submit their proposed project to the Department of the Environment for environmental screening, as part of the environmental clearance process. Project screening means determination of proposed subprojects on whether it would be necessary or not for them to proceed with initial assessment of impact on environment and/or society or detailed environment impact assessment. The EIA Regulations outline criteria for environmental impact, define significant environmental issues, and stipulate the minimum content of an EIA. Of major significance in the EIA Regulations are two schedules: one which categorizes projects for which EIA is mandatory (Schedule I), and the other (Schedule II) that stipulates those projects, which based on their magnitude, nature, location, etc. may be required to conduct an EIA, but at minimum, a Limited Level Environmental Study.. There is also a Schedule III of the

FINAL DRAFT

EIA Regulations which are guidelines to be used by permitting agencies to determine which type of project are required to be submitted to the DOE for Environmental Clearance. All projects to be implemented under the BCRIP are required to obtain environmental clearance from the DOE.

All BCRIP “Category B” subprojects require screening for environmental assessment according to the EIA Regulations, applying the respective “Checklist and Guidelines” outlined to the project.

The extent of environmental work that might be required, prior to the commencement of road works, will depend on the outcome of the screening process described below.

Step 1: Screening of Sub-projects

Prior to commencement of works, SIF and MoWT staff or selected consultants will prepare a list of sub-projects (detailing the civil works to be conducted and their potential impacts – see Table 7). SIF will then submit this list to the Department of the Environment. Based on this list, the DOE will determine if the sub-projects are Schedule I or II.

As part of the screening process, the DOE may organize and conduct site inspections to the proposed project areas along with relevant agencies.

The screening process will facilitate the identification of potential environmental impacts, the determination of their significance, the assignment of the appropriate environmental category (consistent with OP 4.01), the determination of appropriate environmental mitigation measures, and the need to conduct an Environmental Study.

All civil works sub-projects under this project are Category B under World Bank guidelines, and will require a simple standardized EMP at an absolute minimum.

(b) Category B: A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas – including wetlands, forests, grasslands, and other natural habitats – are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigatory measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A. Like Category A, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

Step 2: Carrying Out Environmental Work

After reviewing the information provided in the environmental screening form, and having determined the appropriate environmental category, DOE will determine whether (a) the application of simple mitigation measures outlined in the Environmental Checklist will suffice; (b) a limited level environmental study (LLES) will need to be carried out (see Annex 8 for sample LLES TOR); or (c) no additional environmental work will be required.

FINAL DRAFT

Carrying out Environmental Study

The environmental clearance process will identify and assess the potential environmental impacts of the proposed construction activities, evaluate alternatives, as well as design and implement appropriate mitigation, management and monitoring measures. These measures will be captured in the Environmental Management Plan (EMP) which will be prepared as part of the EIA process for each sub-project. A generic LLES TOR in Annex 8 will guide EA study for category B sub-projects.

Preparation of the required study, if any, will be carried out in consultation with the relevant sector Ministries including potentially affected persons. The relevant government departments in close consultation with SIF and the MoWT will arrange for: (i) preparation of Environmental Study terms of reference for sub-projects; (ii) recruitment of a service provider to carry out the Environmental Study; (iii) public consultations; and (iv) review and approval of the Environmental Study by the DOE.

Step 3: Review and Approval of the Screening Activities

The results and recommendations presented in the environmental screening form and the proposed mitigation measures presented in the environmental checklists will be reviewed by the DOE.

Where an EIA has been carried out, DOE will review the reports to ensure that all environmental impacts have been identified and that effective mitigation measures have been proposed.

Based on the results of the above review process, and discussions with the relevant stakeholders and potentially affected persons, DOE, in case of projects that do not require an EIA, will make recommendations regarding the approval/disapproval of the screening results and proposed mitigation measures. As regards EIA reports, the DOE will recommend EIA reports to the NEAC for approval.

Step 4: Public Consultations

Public consultation is a regulatory requirement by DOE (and the EIA process) and World Bank safeguards for new projects by which the public's input on matters affecting them is sought in regard to the sub-project. Its main objectives will be improving the efficiency, transparency and public involvement in the sub-project that will enhance the compliance of the environmental laws and policies in regard to the implementation of the sub projects. It will involve notification (to publicize the matter to be consulted on), consultation (a two-way flow of information and opinion exchange), as well as participation involving interest groups.

Step 5: Environmental Monitoring

This describes the processes and activities that need to take place to characterize and monitor the quality of the environment in the sub-project sites. This will be used towards the preparation of

FINAL DRAFT

environmental screening, as well as in many circumstances in which the sub-project activities carry a risk of harmful effects on the natural environment. All monitoring strategies and programs for the sub-projects shall have reasons and justifications which will be designed to establish the current status of an environment or to establish trends in environmental parameters where the sub-projects shall be implemented. In all cases, the results of monitoring will be reviewed, analyzed statistically and published for the purpose of project implementation. The sub-project design should have a monitoring programme which must have regard to the final use of the data before project monitoring starts. This environmental monitoring for the sub-projects should be continued throughout the duration of the BCRIP.

Regulation 22A of Section 13 of the EIA (Amendment) Regulations of 2007 states that the Developer (in this case SIF) may be required to pay an environmental monitoring fee, which will be used by the DOE for monitoring and assessments of BCRIP civil works projects. Section 30 of Section 18 further states that the DOE “may require performance bonds or guarantees at an appropriate level” to ensure that SIF and the civil works contractor complies with the terms and conditions of environmental compliance plan for each sub-project.

Step 6: Environmental Monitoring Indicators

These are the measurement, statistics or values that provide an approximate gauge or evidence of the effects of environmental management programs or of the state or condition of the environment that could result from sub-projects that will be implemented. The environmental indicators that need to be monitored include; air quality, water quality, flora and fauna, human health, social and economic conditions.

6.1.2. ENVIRONMENTAL MANAGEMENT PROCESS

The Environmental Management Plan outlined on Table 7 consists of a set of measures to be undertaken during planning, design, procurement, construction and post-construction stages of the road infrastructure development activities to be financed in the BCRIP, to eliminate adverse environmental impacts, offset them, or reduce them to acceptable levels. The EMP includes the actions needed to implement these measures.

In order to ensure the effective implementation of the EMP, it will be necessary to identify and define the responsibilities and authority of the various organizations that will be involved in the project. The following entities will be involved in the implementation of the EMP:

- Social Investment Fund (SIF);
- Ministry of Works and Transport (MoWT);
- Department of the Environment (DOE);
- Institute of Archaeology (IOA);
- Lands and Surveys Department (MNRA);
- Contractor(s).

FINAL DRAFT

The Social Investment Fund is the implementing entity for the BCRIP. Therefore, the responsibility for ensuring that mitigation measures specified in this EMP and the contract documents are implemented will lie with them.

The Ministry of Works and Transport is the government entity that bears ultimate responsibility for bridge construction and maintenance, public works, and road construction and maintenance, as well as traffic and transport, among other responsibilities. The MoWT is therefore responsible to construct and alter all public roads of Belize (or supervise such works). The MoWT has jurisdiction for “the exercise of powers and functions in respect of the construction, maintenance, repairs and all other works of a similar nature... in respect of all highways... whether any part of any highway falls within the limits of a City, a Town, a Village or any other local authority.”

The DOE is responsible for administering the Environmental Protection Act and related regulations, including the EIA Regulations. These responsibilities include the continuous and long-term assessment of natural resources and pollution, pollution prevention and control by coordinating all activities relating to the discharge of wastes into the environment, monitoring environmental health, and examining and determining whether environmental impact assessment or LLES are required for development projects and to make suitable recommendations to mitigate against harmful effects of any proposed action on the environment. The DOE, in consultation with relevant permitting agencies, would screen projects referred to the DOE for determination as to whether an EIA or an LLES should be conducted

The IOA is in charge of protecting and preserving known features of archaeological or cultural importance. If any such feature is discovered during the project works, the IOA would provide recommendations for the protection of any features, and deciding on subsequent appropriate procedures.

The Lands and Surveys Department through its Physical Planning Section accepts and vets all applications for land subdivision/consolidation. Once applications are vetted, they are submitted to the Land Subdivision and Utilization Authority for recommendation.

The Contractor will be appointed by the SIF and will be required to comply with the requirements of the LLES/EMP and the requirements of the MoWT, which include specifications for the following:

- Potential impacts to biodiversity, both terrestrial and aquatic as a result of the development;
- Potential impacts to the hydrology and water quality of water resources;
- Potential impact arising from the production of solid and liquid waste and the management thereof;
- Potential impact from energy generation and the storage of fuel;
- Potential impacts associated with transportation;
- Potential impacts to human, socio-economic and culture; and
- Potential impact associated with earth movement activities, among other specifications.

Table 7: Environmental Management Plan

Category of Impact	Recommended Mitigation measures	Goals	Who Responsible	Timeframe and Monitoring Indicators
Wildlife disturbance Alteration of waterways Reduces wildlife habitat Habitat degradation	<ul style="list-style-type: none"> • Minimize clearance of vegetation • Only use mechanical and manual methods to remove vegetation • Minimize earthworks • Site rehabilitation • Comply with the Forest Act 	To reduce land loss	MoWT, Chief Engineer and Contractor	
Wildlife disturbance Increases artificial edges that affect the species Reduction and alteration of wildlife habitats Create wider gaps at wildlife crossing points and make wildlife more susceptible to traffic collisions Alteration of waterways	<ul style="list-style-type: none"> • Avoid burning cut vegetation • Remove vegetative debris from work sites as soon as possible • Minimize removal of vegetation near wildlife crossing points • Remove vegetation in areas only where it is absolutely necessary • Only use mechanical and manual methods to remove vegetation • Keep vegetative debris away from drainage systems • Site rehabilitation • Comply with the Forest Act 	To protect vegetation	MoWT, Chief Engineer and Contractor	
Contaminate environment with components such as polycyclic aromatic hydrocarbons, phenols, benzene, hydrogen sulphide, and toluene Affects wildlife Affects workers' health Alteration of waterways	<ul style="list-style-type: none"> • Compact paved surface as soon as possible to minimize leaching of asphalt components • Workers wear respirators • Minimize asphalt from getting into waterways and non-paved areas 	To ensure proper use of asphalt	Contractor	
Alteration of waterways	<ul style="list-style-type: none"> • Minimize removal of vegetation 	To prevent or	MOW, Chief	

FINAL DRAFT

	<ul style="list-style-type: none"> Land loss 	<p>soil</p> <ul style="list-style-type: none"> Monitor areas of exposed soil during periods of heavy rainfall Clear vegetation in areas only where it is absolutely necessary Clearly demarcate work areas Site rehabilitation 	erosion and protect topsoil	Contractor	
Siltation	<ul style="list-style-type: none"> Pollution of waterways Habitat alteration Affects wildlife 	<ul style="list-style-type: none"> Minimize removal of vegetation Minimize earthworks and removal of soil Clearly demarcate work areas Site rehabilitation 	To reduce siltation	MOW, Chief Engineer and Contractor	
Pollution	<ul style="list-style-type: none"> Use of asphalt introduces contaminants into the environment Equipment and work vehicles spill engine oil and lubricants in soil and water Siltation of waterways Habitat degradation Affects wildlife and human health 	<ul style="list-style-type: none"> Protect adjacent non-paved surfaces from asphalt overspray Minimize stockpiles of construction debris near waterways Remove waste from work sites as soon as possible Clean up chemical or fuel spills immediately and transfer all clean-up materials to an appropriate disposal site Compact paved surface as soon as possible to minimize leaching of asphalt components Comply with the Environmental Protection Act 	To minimize pollution and ensure proper handling of chemicals or fuels	Contractor	
Waste disposal	<ul style="list-style-type: none"> Wildlife disturbance Pollution of soil and water 	<ul style="list-style-type: none"> Minimize stockpile of construction waste Place waste away from drainage systems Remove waste from work sites as soon as possible 	To ensure waste is managed properly	Contractor	
Workmen's camps and settlements	<ul style="list-style-type: none"> Wildlife disturbance Reduction and alteration of wildlife 	<ul style="list-style-type: none"> Existing camps will be utilized The amounts of campsites should be 	To reduce impacts from	Contractor	

FINAL DRAFT

	<ul style="list-style-type: none"> habitats Pollution of environment 	<ul style="list-style-type: none"> minimized Minimize camp and settlement size Minimize removal of vegetation and earthworks Minimize waste Site rehabilitation Place “Prohibited Activities” signs at all workers settlements 	workmen’s camps and settlements		
Hydrogeology	<ul style="list-style-type: none"> Alteration of water courses Siltation of streams and rivers Wildlife disturbance Poor water channel drainage Water stagnation and obstruction of water flow Vegetation and soil removal Habitat alteration 	<ul style="list-style-type: none"> Minimize removal of soil from banks during work along waterways Minimize material and waste debris stockpiles and locate away from drainage systems Keep drain systems clean – manually remove Water Hyacinth where necessary Encourage re-vegetation in areas where possible to prevent soil exposure Monitor areas of exposed soil during periods of heavy rainfall Ensure culverts, bridges, and retaining walls along embankments are properly constructed Site rehabilitation 	To maintain good hydrogeology	MOW, Chief Engineer and Contractor	
Ambient noise	<ul style="list-style-type: none"> Wildlife disturbance Affects hearing of workers and people in work area 	<ul style="list-style-type: none"> Maintain equipment and work vehicles in proper running order, and ensure that they have the adequate muffling devices installed Restrict work activities to the daytime, and where necessary, minimize work during the night-time Work personnel should wear hearing protection Comply with regulations for noise 	To minimize exposure of workers and community members to noise nuisance	Contractor	

FINAL DRAFT

		abatement			
Dust and air emissions	<ul style="list-style-type: none"> • Affect vegetation • Affect human health 	<ul style="list-style-type: none"> • Periodically water work area during noticeable dry periods • Keep material in small stockpiles and keep stockpiles watered periodically • Prohibit burning of any construction waste • Work personnel should wear respirators in dusty and high VOCs environments • Maintain equipment in proper running order and ensure that they have the adequate muffler devices installed • Idling of equipment should be minimized • Air emissions from asphalt will be eventually reduced over time through compaction and weathering • Comply with air pollution regulations 	To reduce pollution of ambient air	Chief Engineer and Contractor	
Wildlife disturbance	<ul style="list-style-type: none"> • Noise generated by workers' activities and machinery • Artificial night light sources • Traffic collisions • Domesticated animals introduced into previously undisturbed wildlife habitat • Fences erected on the side of the road • Material placed upon roads • Land loss and removal of vegetation 	<ul style="list-style-type: none"> • At bird congregation areas, widen shoulders on both sides of the road if necessary and incorporate an observation station(s) • Place wildlife crossing signs at key crossing points, such as along the George Price Highway that traverses the Central Belize Wildlife Corridor • Place speed bumps or other speed reduction or traffic calming measures at key crossing points and in the vicinity of protected areas • Comply with the Wildlife Protection Act 	To reduce wildlife injury and mortality	Contractor	

6.1.3. INTERNAL TOOL FORM FOR ENVIRONMENTAL MANAGEMENT

A series of environmental instruments have been designed for the internal use of SIF as the entity responsible for environmental management, in order to systematize the activities that will be developed during the project cycle, to organize the processes, and to keep records of the process.

The instruments identified for the different stages of the project cycle are the following: a) Environmental Categorization Form (ECF); b) Environmental Follow-up Report (EFUR); and c) Environmental Final Report (EFR).

6.1.3.1. ENVIRONMENTAL CATEGORIZATION FORM (ECF)

The ECF is the first internal instrument of the SIF that is used in the first stage of the project cycle, in order to classify potential environment risks in a rapid and easy form, and to identify the environmental studies needed in the next stage of project assessment. The format of this instrument is presented in Annex 4.

6.1.3.2. ENVIRONMENTAL FOLLOW-UP REPORT (EFUR)

The EFUR is an internal instrument that is used during the works execution phase for the purposes of follow up and monitoring the measures identified in the environmental management plans. The EFUR basically contains information about the periodic field visits, the persons who visited the subproject, environmental aspects observed and recommendations for follow up. The format of this instrument appears in Annex 5.

6.1.3.3. ENVIRONMENTAL FINAL REPORT (EFR)

The EFR is the final internal instrument to be developed once the works execution has ended. This is done in order to verify the fulfillment of all the environmental measures agreed in the respective plans. The format of this instrument appears in Annex 6.

6.2. DIALOGUE AND DISCLOSURE MECHANISM

The dialogue and disclosure required before and during execution of any works is a function of the environmental categorization. These actions ensure that the people or communities in the direct and indirect areas of influence have knowledge about the benefits and potential negative impacts that will be present in the project. The discussion that follows presents the requirements for Dialogue and Disclosure for each environmental categorization.

6.2.1. CONSULTATION/DIALOGUES REQUIRED AS A FUNCTION OF THE ENVIRONMENTAL CATEGORY

The projects should contain an element of dialogue/consultation with local stakeholders, including the community, during the phase of evaluation, to inform them of the purposes of the project and the potential environmental impacts (positives and negatives). The quantity and depth of this type of consultation depends on the environmental categorization of the

FINAL DRAFT

project. Minutes of consultations, and follow-up actions taken, will be incorporated into all EAs for sub-projects.

6.2.2. CATEGORY B PROJECTS: MODERATE LEVEL OF ENVIRONMENTAL RISK

For these projects, it is required to carry out at least one consultation session with local actors, including the community. This dialogue should include the following aspects: a) purposes of the project; b) results of the environmental categorization and evaluation; and c) presentation of the complementary studies required in case they apply.

6.2.3. CATEGORY C PROJECTS: LOW LEVEL OF ENVIRONMENTAL RISK

Although a dialogue process is not required, it will be necessary to maintain a good communication system to keep the community informed about the project.

6.2.4. DISCLOSURE

All the projects should include a strategy for public information disclosure, in order to keep the general public and the actors involved in the project informed about its purpose and the potential environmental impacts. The disclosure of information will be done through the use of the local media and the internet to reach the local community. The information being disclosed should be in a language or languages that the targeted stakeholders understand.

In general, the information that would be published should contain: i) basic information on the project; ii) environmental categorization; iii) terms of reference for the required environmental studies; iv) the summary and the results of the community consultations; v) the environmental studies developed; vi) in the cases that apply, the Resettlement Action Plan; and Heritage and Cultural Resources Plan; vii) any another important studies that have been done on the project; viii) the announcement of the contractors; and ix) the contracts with specific environmental commitments to be executed during construction.

In addition, the following information should also be made public in adequate local media: i) the place, date and participants in the project consultations, ii) the draft of the study of environmental impact, and iii) the draft of the plans mentioned to ensure that the participating local actors to the consultations have adequate information with sufficient time to be able to participate meaningfully in the consultations.

REFERENCES

- Alegria, H. A., Bidleman, T. F., & Shaw, T. J. (2000). Organochlorine pesticides in ambient air of Belize, Central America. *Environmental Science and Technology*, *34*, 1953-1958.
- Alegria, V.E. (2009). Land-based sources of pollutants to coastal waters of southern Belize: Comparison of predictive model with empirical data. *Graduate School Theses and Dissertations*. Paper 1825. Available online: scholarcommons.usf.edu/etd/1825.
- Belize Coastal Zone Management Authority and Institute (CZMAI). (2010). The National Integrated Coastal Zone Management Strategy for Belize. Belize City, Belize.
- Belize Enterprise for Sustainable Technology (BEST). (2008). National Integrated Water Resources Management Policy (including Climate Change) for Belize. Belmopan, Belize.
- Belize Forest Department. (2011). Government of Belize IV National Report to the United Nations Convention On Biodiversity. Belmopan, Belize.
- Biodiversity and Environmental Resource Data System of Belize (BERDS). (2014a). Belize: Ecosystem. Retrieved January 21, 2014, from <http://www.biodiversity.bz/find/ecosystem/>
- Biodiversity and Environmental Resource Data System of Belize (BERDS). (2014b). Belize: Species. Retrieved January 15, 2014, from <http://www.biodiversity.bz/find/species/>
- Boles, E. (1999). The Sibun River Watershed Atlas. Sibun Watershed Association. GOB Printers. Belmopan, Belize.
- Boles, E., Buck, D., & Esselman, P.C. (2008). Status, Needs, and Future Directions for Effective Freshwater Conservation in Belize, Central America.
- Caribbean Community Climate Change Centre (CCCCC). (2012). Greenhouse Gas Inventory Development Report: Belize. Belmopan Belize.
- Cherrington, E.A., Cho, P.P., Waight, I., Santos, T.Y., Escalante, A.E., Nabet, J., et al. (2012). Forest Cover and Deforestation in Belize, 2010-2012.
- Darwin Initiative. (2000). Belize Savanna FactSheet A3 Soil and Vegetation Associations in Belize. Available online: www.eeo.ed.ac.uk/sea-belize.
- Department of the Environment (DOE). (2011). Procedures Manual for the Preparation of an Environmental Impact Assessment (EIA) in Belize. Belmopan, Belize.
- Department of the Environment (DOE). (2014a). Effluent Discharge. Belmopan, Belize.

FINAL DRAFT

Department of the Environment (DOE). (2014b). Belize Environmental Protection Act, Revised Edition, 2000. Belmopan, Belize.

Department of the Environment (DOE). (2014c). Environmental Protection Act Chapter 328, Revised Edition 2000. Retrieved February 11, 2014, from <http://www.doe.gov.bz/documents/legislation/cap328.pdf>

Department of the Environment (DOE). (2014d). Environmental Protection Act Chapter 328, Revised Edition 2003. Environmental Impact Assessment Regulations. Retrieved February 11, 2014, from <http://www.doe.gov.bz/documents/legislation/328sEIARegulations.pdf>

Department of the Environment (DOE). (2014e). Environmental Protection Act Chapter 328, Revised Edition 2003. Environmental Protection (Effluent Limitations) Regulations. Retrieved February 11, 2014, from <http://www.doe.gov.bz/documents/legislation/328sEffluentRegulations.pdf>

Dixon, C.G. (1956). Geology of Southern British Honduras With Notes on Adjacent Areas.

Flores, G. (1952). Geology of Northern British Honduras. *Bulletin of the American Association of Petroleum Geologists*, 36(2), 404-409.

Frutos, R. (2003). Progress and Constraints in Developing Integrated Water Resources Management in Belize. National Meteorological Service. Retrieved January 16, 2014, from <http://www.hydromet.gov.bz/hydrological-reports>.

Jones, H.L. (2003). Birds of Belize. Austin, Texas, USA: University of Texas Press.

Karper, J., & Boles, E. (2004). Human Impact Mapping of the Mopan and Chiquibul Rivers within Guatemala and Belize With Comments on Riparian Forest Ecology, Conservation and Restoration.

King, R.B., Baillie, I.C., Abell, T.M.B., Dunsmore, J.R., Gray, D.A., Pratt, J.H., et al. (1992). Land Resource Assessment of Northern Belize (Bulletin No. 0B43). Natural Resources Institute (NRI), Chatham, UK.

Land and Surveys Department. (2010a). Belize Environment Outlook. Belmopan, Belize.

Land and Surveys Department. (2010). National Guidelines for Subdivision and Consolidation of Land in Belize. Belmopan, Belize.

McCloskey, T., & Keller, G. (2009). 5000 Year Sedimentary Record Of Hurricane Strikes On The Central Coast Of Belize. *Quaternary International*, 195 (1-2), 53-68.

Medlin Jr., R.E. (2008). State of the Environment: Belize. *Journal of Integrative Biology*, 2(2), 77-94. Available online: altweb.astate.edu/electronic_journal/medlin_belize.htm.

FINAL DRAFT

Meerman J.C. (2005a). BPAPSP – Protected Areas System Assessment & Analysis: National List of Critical Species.

Meerman, J.C. (2001). A first assessment of damage to terrestrial ecosystems in Southern Belize As caused by Hurricane Iris of October 8, 2001.

Meerman, J.C., & Wilson, R. (2005b). The Belize National Protected Areas System Plan.

Merrill, T. (Ed). (1992). Belize: A Country Study. Washington: GPO for the Library of Congress. Retrieved January 15, 2014 from <http://countrystudies.us/belize/18.htm>.

Miller, B.W. & Miller, C.M. (1997). Avian Risk Assessment, Bird Species Of Conservation Concern In Belize. Belize.

Ministry of Natural Resources, Environment, and Industry (MNREI). (2002). Belize National Report To the World Summit On Sustainable Development. Belmopan, Belize.

Ministry of Works. (1999). Manual of Standards and Q.C. Belmopan, Belize.

Myvette, G, & Quintana, R. (2002). The Status of Aquaculture in Belize. Aquaculture and Inland Fisheries Unit. Fisheries Department. Belize City, Belize.

National Meteorological Service (NMS). (2014). Climate Summary. Retrieved January 21, 2014, from <http://www.hydromet.gov.bz>.

Ower, L.H. (1928). Geology of British Honduras. *Geographical Journal*, 36, 494-509.

Programme for Belize (PFB). (2003). Proceedings of the First Belize Freshwater Summit. Belize City, Belize.

Second National Communication: United Nations Framework Convention on Climate Change. (2011). Belmopan, Belize.

Simple bird observation platform. (2014a). Retrieved February 2, 2014, from <http://www.biodiversity.bz/find/ecosystem/www.caribbeanbirdingtrail.org>

Simple bird observation platform. (2014b). Retrieved February 2, 2014, from www.managingenterprisecontent.com

Young, C. (2008). Belize's Ecosystems: Threats and Challenges to Conservation in Belize. *Tropical Conservation Science*, 1(1), 18-33. Available online: tropicalconservationscience.org.

ANNEX 1: STAKEHOLDERS CONSULTED

Persons	Post/Agency
Alex Escalante	Forest Technician, Forest Department
Anthony Mai	Unit Head, DOE – ECMEU
Antoine Devonshire	BCRIP, Social Investment Fund
Arvin Coc	Belize Audubon Society
Cadet Henderson	Former Chief Engineer/Former CEO, MOWT
Carlos Fuller	International and Regional Liaison Officer, CCCCC
Carren Williams	Land Information Center, MNRA
Catherine Cumberbatch	Deputy Chief Meteorologist, NMS
Craig Moore	Deputy Director, Geology and Petroleum Department
Daniel Chi	Forest Technician, Forest Department
Dennis Gonguez	Chief Meteorologist, NMS
Denver Cayetano	Publications Assistant, Environmental Research Institute, University of Belize
Derric Calles	Executive Engineer, MoWT
Errol Gentle	CEO, MoWT
Erwin Jimenez	GIS Technician, DOE
Evondale Moody	Project Engineer, MOW
Heron Moreno	Corozal Sustainable Future Initiative
Howard Cabral	Safety, Health and Environment Coordinator, BECOL
Hugo Castillo	Sarteneja Alliance for Conservation and Development
Irving Thimbriel	BCRIP, MoWT
Jan Meerman	BERDS
Jorge Franco	Head of EIA Unit, DOE

FINAL DRAFT

Jose Encalada	Civil Engineer, MoWT – Project Execution Unit
Joseph Villafranco	Toledo Institute for Development and Environment
Lester Delgado	Corozal Sustainable Future Initiative
Marcello Windsor	Deputy CFO. Forest Department
Marco Leal	Environmental Technician, DOE – ECMEU
Marcus Kingston	Cayo District Association of Village Council
Martin Alegria	CEO, Department of the Environment
Mr. Nabet	Forest Technician, Forest Department
Rasheda Garcia	Forest Department
Stephen Usher	Vice President of Operation, BECOL
Tyrone Hall	Communications Specialist, CCCCC

A. Approach to EIA

An environmental impact assessment (EIA) is recognized as a multidisciplinary activity that should address not only the impacts a project may have on the biophysical environment but also on the socio-cultural environment. As such, an EIA requires the expertise of people knowledgeable in several areas including the biological sciences, flora, fauna, and ecological studies; physical sciences, such as geology and hydrology; engineering; and the social sciences. In order to bring these areas of expertise together, an EIA is normally conducted by a team of "experts" under the direction of a team leader ultimately responsible for preparing the final EIA report.

A crucial component of the EIA process is the participation of the public, particularly those who may be directly affected by the project. The Environmental Protection Act stipulates this requirement and the EIA Regulations make procedural provisions for the public to participate in the EIA process by making available to interested persons information concerning the proposed project. The Regulations also specify criteria to determine whether an undertaking requires a public hearing.

Public consultation is necessary to open the flow of environmental information concerning the proposed project, clarify misconceptions, and enhance social acceptability. Thus, it is recommended that affected groups, NGOs, and GOB agencies be involved in the scoping of the project for which an EIA has been deemed necessary, and consulted on the draft EIA report.

B. Steps in the EIA Process

There are eight major steps in the EIA process in addition to reporting and reviewing the completed EIA. These are: project definition, screening, scoping, description of the biophysical and socio-cultural environment, determination of impacts, considerations of alternatives, mitigation plans, and monitoring plans. These steps are described below, and are also addressed in the EIA Regulations and the Procedures for the Preparation of an EIA (DOE, 2011).

1. Project Description

Also called project definition, this is a critical first step in the EIA process. It describes in detail the proposed project: the location, layout and infrastructure, construction activities, operation and maintenance activities, and life span. Every other step in the EIA process is dependent on the full understanding of the proposed project. Preparation of the project description is basically the responsibility of the project proponent.

FINAL DRAFT

2. Screening

Screening is the procedure of determining whether an EIA is required for the proposed project. The EIA Regulations 1995 defines categories of projects under three schedules: Schedule I Projects are those for which EIAs are absolutely required. Schedule II projects are those that should be given consideration and may require some form of evaluation; and Schedule III refer to those projects not requiring EIA.

In Belize, screening of projects requiring EIA is the prerogative of the DOE along with relevant permitting agencies. The responsibility of permitting resource use, such as logging, fishing or aquaculture, mining, etc., falls within the mandates of three different permitting agencies: Forest Department, Fisheries Department, and Geology and Petroleum Department, respectively. The DOE has no role in permitting resource use but has jurisdiction over the environmental soundness of the projects and activities utilizing Belize's natural resources. Consequently, screening of projects, particularly of schedule II Projects, require some level of cooperation between the DOE and the permitting agency.

Procedurally, permitting agencies are required to screen all projects within the framework of the EPA and the EIA Regulations. An environmental screening form is normally used to facilitate the process. Projects outlined in Schedule I of the EIA Regulations should automatically be referred to the DOE and the NEAC; for those that fall within Schedule II the permitting agency should determine whether an EIA is required. When in doubt, the assistance of DOE should be sought (DOE, 1994).

3. Scoping (Impact Identification)

For those projects requiring an EIA, the impacts of concern and those that should be evaluated are identified, and a Terms of Reference for conducting the assessment is drafted. This activity, called scoping, should involve consultation with GOB agencies, NGOs, affected community groups and the general public to identify key issues for evaluation.

Scoping usually consist of two parts: First, an exhaustive list of all impacts, severe as well as trivial, is drawn up. Then this list is carefully examined, and a manageable number of important impacts are selected for study. The rest are discarded.

In order to determine which impacts should be studied in detail, four criteria should be applied: magnitude, extent, significance, and special sensitivity. Magnitude refers to the quantum of change that will be experienced. A change of great magnitude would be, for example, the doubling of a town's population. In other words, the measured level of the environmental parameter will be twice what it was before.

The extent of an impact refers to the area which will be affected. The pollution of an entire estuary would be considered extensive, whereas the pollution of a localized area of the bay would not be so rated.

FINAL DRAFT

The significance of an impact looks beyond the magnitude of the effects. Consider an aquatic species which requires a minimum of 10 parts per million (ppm) of dissolved oxygen in the water to survive. If that species is endangered, or if it has economic or recreational value, then a change from 12 ppm to 9 ppm of oxygen, though not great in magnitude, is certainly significant. The criterion of special sensitivity is region and country specific and basically asks whether any impact of a proposed action will affect an area of special sensitivity.

4. Description of the Environment

This is a critical step because it defines the environmental parameters within which the proposed project is to be conducted, and is a prerequisite for the determination of impacts. This description should be of the study area, which is a defined area within which all effects, impacts, features, and potential compensation efforts would occur from a proposed action and its alternatives. This description also provides baseline data with which environmental impacts can be predicted, and against which the predicted impacts of the proposed action can be compared.

The approach normally adopted in this aspect of the EIA is the subdivision of the environmental setting into logical and hierarchical set of categories. The major categories would likely include the following: Geology, Topography, Soils, Hydrology, Terrestrial Communities, Aquatic Communities, Environmentally Sensitive Areas, Air Quality, Land Use, Demography, Sound Levels, Socioeconomic, Infrastructural Services, Transportation, Cultural Resources, and Project Economics. The level of detail contained in the description of the environment will vary according to the nature of the proposed project and the EIA terms of reference.

5. Determination of Impact

Although difficult, the EIA should attempt to predict, quantitatively, the impacts on the various components of the environment and indicate where irreversible loss will occur. Where impacts cannot be quantified, they should be treated in a qualitative form.

For the biological environment, it is important to forecast impacts that may cause a change of state. In terms of hydrology, water quality and quantity should be considered. For air quality, air models can be used to forecast changes in air quality. It is also crucial to determine how the proposed action will impact on costs to the community and the cultural environment. The resources required for the quantification of impacts are persons competent to do the required calculations or qualitative assessments.

6. Mitigation Measures

Mitigation is the means by which adverse impacts of a project is prevented or reduced; it basically reflects the limits of change that will be accepted those involved (proponents and stakeholders) upon project approval. Mitigate measures are normally included as conditions for implementation.

Such measures may be engineering works (e.g. dust collectors, sludge pods, noise mufflers, etc.) or management practices (e.g. crop rotation, phased plant shut-downs, etc.). All mitigation measures have associated costs.

FINAL DRAFT

In some respects, mitigation planning is a part of impact evaluation. When applicable mitigate measure have been identified, it becomes necessary to compute their cost, and to re-quantify the level of impact, acknowledging the beneficial effect of the mitigate measure. Depending on circumstances, mitigate measures may give rise to two project alternatives where only one existed before.

7. Alternatives

A central theme of an EIA is the consideration of practical alternatives to the proposed project including the no-action alternative. This is to ascertain the benefits of the proposed project and insure thorough consideration of mitigation measures that should be employed. It is at this point that the technical information gained in previous steps will be pulled together. It is also at this point that environmental losses and gains will be combined with the economic costs and benefits to produce a full picture for each project alternative. The intended output is a series of recommendations from which the decision-maker will choose a course of action.

In order to proceed to compare alternatives, two pieces of information are required. These are: a summary of positive and negative environmental impacts; and a summary of economic costs and benefits. The former will have to be generated as part of the preceding steps in the EIA. The latter may be developed as part of the EIA, or from a parallel economic analysis.

8. Monitoring and Evaluation

As a means to ensure that mitigation measures are adhered to, a monitoring plan is prepared and included in the final EIA report. This plan identifies pertinent indicators of environmental health, and ecological balance and outlines a schedule for periodic checks of these indicators. Results of monitoring can allow for necessary adjustments for successful project implementation.

9. Documentation and Reporting

The tasks of project description, description of the environment, determination of impacts, analysis of alternatives, definition of mitigation and a monitoring plan are all included as components of the EIA report. It is the responsibility of the designated EIA Team Leader to pull together the important elements of the various steps in the process into one coherent document - The EIA Report. This report is then to be submitted to DOE for review by the NEAC and for possible public hearings.

The EIA report should follow the format outlined in the EIA Regulations and should be submitted in multiple copies for all members of the NEAC. The report should also be in language for laypersons, not scientific language, as the EIA report is public information. Furthermore, the report should be concise and unambiguous; recommendations needs to be clearly stated, and reasons for those recommendations presented in summary form.

FINAL DRAFT

C. The Review Process and the Role of the NEAC

The EIA Regulations stipulate that there shall be an Appraisal Committee whose function shall be to review all EIAs, advise DOE of the adequacy or otherwise of an EIA, and advise DOE where a public hearing is desirable and necessary. The Regulations also define the composition of the NEAC as follows: Chief Environmental Officer (CEO), Commissioner of Lands, Chief Forest Officer, Fisheries Administrator, Chief Hydrologist, Archaeological Commissioner, Director of Geology and Petroleum, Chief Meteorologist, and an appropriate NGO.

Just as the preparation of an EIA is a multidisciplinary activity, the revision of the reports needs to be conducted by a multidisciplinary team. The DOE serves as the secretariat for the NEAC with the CEO, as the chair, responsible for collating the views of the NEAC Members on the soundness of environmental management practices reflected in the EIA. The role of each NEAC Member is therefore critical for efficient review of EIA reports.

It should be noted that in addition to being members of the NEAC, many of these member agencies are permitting agencies responsible for authorizing resource use. Hence, the NEAC revision process provides a forum for validation of development projects.

ANNEX 3: CHANCE FIND PROCEDURES

Contracts for civil works involving excavations should normally incorporate procedures for dealing with situations in which buried Physical Cultural Resources (PCR) are unexpectedly encountered. The final form of these procedures will depend upon the local regulatory environment, including any “chance find” procedures already incorporated in legislation dealing with antiquities or archaeology.

Note: The case for which the general guidance below is provided applies where there will be an archaeologist on call. There are no PCR-rich areas such as a UNESCO World Heritage site within the BCRIP subproject areas, so it would not be necessary for an archaeologist to be on site to monitor the excavations and make decisions on-site. In the eventuality that it is deemed advisable to have an archaeologist on site, a modified version of these procedures will be agreed with the National Institute for Culture and History (NICH) and its Institute of Archaeology.

The following “*chance find*” procedures are to be included in all civil works contracts:

If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:

- Stop the construction activities in the area of the chance find;
- Delineate the discovered site or area;
- Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until NICH and its Institute of Archaeology take over;
- Notify the supervisory Project Environmental Officer and Project Engineer who in turn will notify the responsible local authorities and the Institute of Archaeology immediately (within 24 hours or less).

The Institute of Archaeology would then be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by the archaeologists of the Institute of Archaeology. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage, namely the aesthetic, historic, scientific or research, social and economic values.

Decisions on how to handle the finding shall be taken by the responsible authorities and the Institute of Archaeology. This could include changes in the layout (such as when finding irremovable remains of cultural or archeological importance) conservation, preservation, restoration and salvage.

Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities.

FINAL DRAFT

Construction work may resume only after permission is given from the Institute of Archaeology concerning safeguard of the heritage.

ANNEX 4: ENVIRONMENTAL CATEGORIZATION FORM

1. GENERAL INFORMATION			
Project name :			
Location:	District:		
Evaluator name:		Date of field visit:	

2. THE SUB-PROJECT	
General purpose of the Sub-Project:	Specific purpose of the sub-project:

3. TYPE OF PROJECT	
Type of sub-project:	Categorization applying the Categorization Table:
•	<input type="checkbox"/> Category “B”

4. SITE SENSITIVITY CLASIFICACION				
Matrix No. 1				
Site Sensitivity				
Description of Settings	High	Moderate	Low	
Site Sensitivity				
1. Natural Habitat/Protected Areas (MFFSD)				
2. Indigenous People				
3. Resettlement and Compensation				
4. Historical and Cultural Property				
5. Vulnerability to Natural Hazards				
				Sensitivity: _____

5. ENVIRONMENTAL CATEGORIZATION				
<p>Category B: Those projects with moderate environmental/ risk, because the road influence area presents moderate level of sensibility, nevertheless the civil works are not of big magnitude. The environmental and social impacts that can appear in this type of projects are easily identifiable.</p>	<p>Matrix No. 2</p> <p>Environmental Categorization</p>			
	Project Grade	Site Sensitivity		
		High	Moderate	Low
	A	A	A	A
	B	A	B	B
C	B	B	C	

6. ENVIRONMENTAL STUDIES REQUIRED BY BELIZE LAW	
Category B:	Environmental Screening (ES)

7. ENVIRONMENTAL AND SOCIAL SAFEGUARDS REQUIREMENTS	
	<input type="checkbox"/> Resettlement Action Plan (Resettlement Process Framework) <input type="checkbox"/> Others: _____

8. MAP PROJECT

9. OSERVATIONS

ANNEX 5: ENVIRONMENTAL FOLLOW-UP REPORT (EFUR)

ENVIRONMENTAL FOLLOW-UP REPORT

Subproject name: _____ Env. Category: _____

Subproject sponsor/owner: _____

Signature

SIF staff: _____

Signature

1. Environmental effects

Summary of the environmental effects of the sub-project that were predicted during project planning.

2. Environmental effects observed in the field visit

Summary of the environmental effects which have been observed in the field visit:

- *Predicted effects and nature of observation;*
- *Unpredicted effects and nature of observation.*

People participating in the field visit:

Name	Institution	Charge	Signature

3. Compliance of the environmental specifications

Project’s compliance with environmental design specifications, including environmental protection and control, mitigation, reimbursement and comparison measures, if any.

4. Results of the field visit

Results of the ongoing monitoring of specific bio-physical and socio-economic effects, including the comparison of baseline values and monitoring results, if available.

5. Conclusions and recommendations to the project operation

Recommendations to project operations if any, including the rationale for such recommendations.

6. Conclusions and Recommendations to the monitoring programme

Recommended adjustments to the monitoring programme, if any, including the rationale for the recommendations.

7. Other observations, recommendations and conclusions.

ANNEX 6: ENVIRONMENTAL FINAL REPORT (EFR)

ENVIRONMENTAL FINAL REPORT

Subproject name: _____ Env. Category: _____

Subproject sponsor/owner: _____

 Signature

SIF staff: _____

 Signature

1. Activities Realized

On _____ (date), a final review of the environmental aspects corresponding to the activity _____ (sub-project name) was conducted with the intention of verifying the fulfillment of the Measurements of Mitigation contemplated for the project, as well as of verifying if other negative impacts have appeared during the period of execution of the work. The following persons were included in the review:

Name	Institution	Charge	Signature

2. Background

This section must record all activities carried out to date with a summary of the issues identified and recommendations made in previous documents (ECF, EFUR).

3. Results of the Examination

Here it is necessary to describe in detail the measures of mitigation, the grade of fulfillment, the current state and, if necessary, the reasons for which the measures have not been completed.

No.	Mitigation measures	Accomplishment			Time to accomplishment of the measures	Observation
		Yes	No	%		

4. Conclusions

Based on the examination and the results of the evaluation, prepare the conclusions of the fulfillment of the measures of mitigation and established recommendations.

ANNEX 7: ENVIRONMENTAL/SOCIAL SCREENING

ENVIRONMENTAL /SOCIAL SCREENING			
Will the site activity include/involve any of the following potential issues and/or impacts:	Activity and potential issues and/or impacts	Status	Additional references
	1. Building rehabilitation <ul style="list-style-type: none"> • Site specific vehicular traffic • Increase in dust and noise from demolition and/or construction • Construction waste 	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section B below
	2. New construction <ul style="list-style-type: none"> • Excavation impacts and soil erosion • Increase sediment loads in receiving waters • Site specific vehicular traffic • Increase in dust and noise from demolition and/or construction • Construction waste 	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section B below
	3. Individual wastewater treatment system <ul style="list-style-type: none"> • Effluent and / or discharges into receiving waters 	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section C below
	4. Historic building(s) and districts <ul style="list-style-type: none"> • Risk of damage to known/unknown historical or archaeological sites 	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section D below
	5. Acquisition of land ¹⁵⁶ <ul style="list-style-type: none"> • Encroachment on private property • Relocation of project affected persons • Involuntary resettlement • Impacts on livelihood incomes 	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section E below
	6. Hazardous or toxic materials ¹⁵⁷ <ul style="list-style-type: none"> • Removal and disposal of toxic and/or hazardous demolition and / or construction waste • Storage of machine oils and lubricants 	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section F below

¹⁵⁶ Land acquisitions includes displacement of people, change of livelihood encroachment on private property this is to land that is purchased/transferred and affects people who are living and/or squatters and/or operate a business (kiosks) on land that is being acquired.

¹⁵⁷ Toxic / hazardous material includes and is not limited to asbestos, toxic paints, removal of lead paint, etc.

FINAL DRAFT

	7. Impacts on forests and/or protected areas <ul style="list-style-type: none"> • Encroachment on designated forests, buffer and /or protected areas • Disturbance of locally protected animal habitat 	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section G below
	8. Handling / management of medical waste <ul style="list-style-type: none"> • Clinical waste, sharps, pharmaceutical products (cytotoxic and hazardous chemical waste), radioactive waste, organic domestic waste, non-organic domestic waste • On site or off-site disposal of medical waste 	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section H below
	9. Traffic and Pedestrian Safety <ul style="list-style-type: none"> • Site specific vehicular traffic • Site is in a populated area 	<input type="checkbox"/> Yes <input type="checkbox"/> No	See Section I below
ACTIVITY	PARAMETER	GOOD PRACTICES MITIGATION MEASURES CHECKLIST	
A. General Conditions	Notification and Worker Safety	<ul style="list-style-type: none"> (a) The local construction and environment inspectorates and communities have been notified of upcoming activities (b) The public has been notified of the works through appropriate notification in the media and/or at publicly accessible sites (including the site of the works) (c) All legally required permits (to include not limited to land use, resource use, dumping, sanitary inspection permit) have been acquired for construction and/or rehabilitation (d) All work will be carried out in a safe and disciplined manner designed to minimize impacts on neighboring residents and environment. (e) Workers’ PPE will comply with international good practice (always hardhats, as needed masks and safety glasses, harnesses and safety boots) (f) Appropriate signposting of the sites will inform workers of key rules and regulations to follow. 	
B. General Rehabilitation and /or Construction Activities	Air Quality	<ul style="list-style-type: none"> (a) During interior demolition use debris-chutes above the first floor (b) Keep demolition debris in controlled area and spray with water mist to reduce debris dust (c) Suppress dust during pneumatic drilling/wall destruction by ongoing water spraying and/or installing dust screen enclosures at site (d) Keep surrounding environment (sidewalks, roads) free of debris to minimize dust (e) There will be no open burning of construction / waste material at the site (f) There will be no excessive idling of construction vehicles at sites 	
	Noise	<ul style="list-style-type: none"> (a) Construction noise will be limited to restricted times agreed to in the permit (b) During operations the engine covers of generators, air compressors and other powered mechanical equipment should be closed, and equipment placed as far away from residential areas as possible 	
	Water Quality	<ul style="list-style-type: none"> (a) The site will establish appropriate erosion and sediment control measures such as e.g. hay bales and / or silt fences to prevent sediment from moving off site and causing excessive turbidity in nearby streams and rivers. 	

FINAL DRAFT

	Waste management	<ul style="list-style-type: none"> (a) Waste collection and disposal pathways and sites will be identified for all major waste types expected from demolition and construction activities. (b) Mineral construction and demolition wastes will be separated from general refuse, organic, liquid and chemical wastes by on-site sorting and stored in appropriate containers. (c) Construction waste will be collected and disposed properly by licensed collectors (d) The records of waste disposal will be maintained as proof for proper management as designed. (e) Whenever feasible the contractor will reuse and recycle appropriate and viable materials (except asbestos)
C. Individual wastewater treatment system	Water Quality	<ul style="list-style-type: none"> (a) The approach to handling sanitary wastes and wastewater from building sites (installation or reconstruction) must be approved by the local authorities (b) Before being discharged into receiving waters, effluents from individual wastewater systems must be treated in order to meet the minimal quality criteria set out by national guidelines on effluent quality and wastewater treatment (c) Monitoring of new wastewater systems (before/after) will be carried out
D. Historic building(s)	Cultural Heritage	<ul style="list-style-type: none"> (a) If the building is a designated historic structure, very close to such a structure, or located in a designated historic district, notify and obtain approval/permits from local authorities and address all construction activities in line with local and national legislation (b) Ensure that provisions are put in place so that artifacts or other possible “chance finds” encountered in excavation or construction are noted, officials contacted, and works activities delayed or modified to account for such finds.
E. Acquisition of land	Land Acquisition Plan/Framework	<ul style="list-style-type: none"> (a) If expropriation of land was not expected and is required, or if loss of access to income of legal or illegal users of land was not expected but may occur, that the bank task Team Leader is consulted. (b) The approved Land Acquisition Plan/Framework (if required by the project) will be implemented
F. Toxic Materials	Asbestos management	<ul style="list-style-type: none"> (a) If asbestos is located on the project site, mark clearly as hazardous material (b) When possible the asbestos will be appropriately contained and sealed to minimize exposure (c) The asbestos prior to removal (if removal is necessary) will be treated with a wetting agent to minimize asbestos dust (d) Asbestos will be handled and disposed by skilled & experienced professionals (e) If asbestos material is to be stored temporarily, the wastes should be securely enclosed inside closed containments and marked appropriately (f) The removed asbestos will not be reused
	Toxic / hazardous waste management	<ul style="list-style-type: none"> (a) Temporarily storage on site of all hazardous or toxic substances will be in safe containers labeled with details of composition, properties and handling information (b) The containers of hazardous substances should be placed in an leak-proof container to prevent spillage and leaching (c) The wastes are transported by specially licensed carriers and disposed in a licensed facility. (d) Paints with toxic ingredients or solvents or lead-based paints will not be used

FINAL DRAFT

<p>G. Affects forests and/or protected areas</p>	<p>Protection</p>	<p>(a) All recognized natural habitats and protected areas in the immediate vicinity of the activity will not be damaged or exploited, all staff will be strictly prohibited from hunting, foraging, logging or other damaging activities.</p> <p>(b) For large trees in the vicinity of the activity, mark and cordon off with a fence large trees and protect root system and avoid any damage to the trees</p> <p>(c) Adjacent wetlands and streams will be protected, from construction site run-off, with appropriate erosion and sediment control feature to include but not limited to hay bales, silt fences</p> <p>(d) There will be no unlicensed borrow pits, quarries or waste dumps in adjacent areas, especially not in protected areas.</p>
<p>H. Disposal of medical waste</p>	<p>Infrastructure for medical waste management</p>	<p>(a) In compliance with national regulations the contractor will insure that newly constructed and/or rehabilitated health care facilities include sufficient infrastructure for medical waste handling and disposal; this includes and not limited to:</p> <ul style="list-style-type: none"> ▪ Special facilities for segregated healthcare waste (including soiled instruments “sharps”, and human tissue or fluids) from other waste disposal: <ul style="list-style-type: none"> a. Clinical waste: yellow bags and containers b. Sharps – Special puncture resistant containers/boxes c. Domestic waste (non-organic): black bags and containers ▪ Appropriate storage facilities for medical waste are in place; and ▪ If the activity includes facility-based treatment, appropriate disposal options are in place and operational
<p>I Traffic and Pedestrian Safety</p>	<p>Direct or indirect hazards to public traffic and pedestrians by construction activities</p>	<p>(b) In compliance with national regulations the contractor will insure that the construction site is properly secured and construction related traffic regulated. This includes but is not limited to</p> <ul style="list-style-type: none"> ▪ Signposting, warning signs, barriers and traffic diversions: site will be clearly visible and the public warned of all potential hazards ▪ Traffic management system and staff training, especially for site access and near-site heavy traffic. Provision of safe passages and crossings for pedestrians where construction traffic interferes. ▪ Adjustment of working hours to local traffic patterns, e.g. avoiding major transport activities during rush hours or times of livestock movement ▪ Active traffic management by trained and visible staff at the site, if required for safe and convenient passage for the public. ▪ Ensuring safe and continuous access to office facilities, shops and residences during renovation activities, if the buildings stay open for the public.

PART C: MONITORING PLAN							
Phase	What (Is the parameter to be monitored?)	Where (Is the parameter to be monitored?)	How (Is the parameter to be monitored?)	When (Define the frequency / or continuous?)	Why (Is the parameter being monitored?)	Cost (if not included in project budget)	Who (Is responsible for monitoring?)
During activity preparation							
During activity implementation							
During activity supervision							

This Terms of Reference (TOR) has been prepared following the scoping for the most critical issues that will need to be addressed by the proposed development of [COMPANY/AGENCY], located within the [LOCATION].

In the preparation of the Limited Level Environmental Study (LLES), the LLES preparers will need to focus on addressing the main areas of concern, such as:

- Potential impacts to biodiversity, both terrestrial and aquatic as a result of the development,
- Potential impacts to the hydrology and water quality of the water resources including [RELEVANT WATERWAYS],
- Provision of potable water supply and impacts associated therewith,
- Potential impact arising from the production of solid and liquid waste and the management thereof,
- Potential impact from energy generation and the storage of fuel,
- potential impacts associated with transportation,
- Potential impacts to human, socio-economic and culture,
- Potential impact associated with earth movement activities.

Scoping of these issues speeds up the LLES process, cuts down its cost, improves the quality of the development and ensures that environmental concerns are clearly addressed.

This Terms of Reference (TOR) is divided into three (3) sections:

A. PROJECT DESCRIPTION AND PHYSICAL ENVIRONMENT

This section of the document deals primarily with information pertaining to the background of the project and the physical environment within which it is proposed. The LLES will need to address:

1. THE PROJECT DESCRIPTION AND LAYOUT PLAN

Maps at appropriate scales must be provided and with proper labels and legends to illustrate the general settings of project related development sites as well as surrounding areas likely to be environmentally affected. These maps shall include property boundary, topographic contours, as well as location of major surface waters, roads, parks or reserves, political boundaries, protected areas and existing adjacent land uses (tourism, agricultural, industrial). Additionally the following should be provided:

- 1.1 Delineate the sub-project boundary outlining its geographic relationship with any terrestrial protected area and give the exact location of the project including GPS coordinates. Also provide a copy of the land tenure documents which shows

FINAL DRAFT

ownership of the project area.

- 1.2 Provide a scaled layout plan for the overall development, including siting of all facilities such as buildings, water supply facilities, water treatment facilities, storage facilities, drainage facilities, power generation facilities, fuel storage facilities, solid and liquid waste disposal facilities, recreational paths/trails, etc; and acreage intended for said activities;
- 1.3 Describe a detailed description of the facilities provided in the plans above (1.2)
- 1.4 Provide specifications and detailed designs for the following:
 - a. Collection and disposal systems for solid waste;
 - b. Sewage collection, disposal, and treatment systems;
 - c. Water source, treatment, and distribution systems;
- 1.5 Provide an outline of the overall management structure anticipated for the proposed development.
- 1.6 Describe the timeline for the implementation of the project.
- 1.7 Provide detailed and adequately labeled maps to illustrate the general settings of project related development sites, as well as surrounding areas likely to be environmentally affected. These maps shall include topographic contours, where available, appropriate buffer zones along all permanent water bodies on site, the location of major surface waters, roads, parks or reserves, political boundaries and existing land use and a map of the project area.

2. THE PHYSICAL ENVIRONMENT

Provide details of the basic physical environment of the project site and zone of influence. This should include:

- 2.1 Location of the project with respect to other land/tourism/sensitive areas including protected areas;
- 2.2 Topography; Include the flood hazard and drainage patterns around the project site;
- 2.3 Current land use of project site and adjacent properties. Provide land use history of the project site;
- 2.4 Any known archaeological sites;
- 2.5 Physical description of surrounding surface water bodies, including the [WATERWAYS] and others;
- 2.6 Climate, and meteorology: Include the rainfall average per year of the area of interest, prevailing wind patterns and susceptibility to natural disasters (i.e. hurricanes);
- 2.7 Geology: Give a detailed description of the area of the characteristics of landforms and geological structures;

FINAL DRAFT

- 2.8 Soils: Soil profile, fertility, permeability, and the potential for erosion of the soils on the project site.

3. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

This section will identify all pertinent legislation relative to the project and its proposed activities, which must be addressed to be environmentally acceptable. This will include but should not be limited to, for example, effluent discharge limitations, permissible noise levels, effluent receiving water quality standards and occupational health and safety requirements.

- 3.1 Describe the pertinent regulations, standards, and policies, at the local and national levels, governing environmental quality, health and safety, and protection of sensitive areas. These could include cultural resources, protection of endangered or threatened species, land development, water resources, infrastructure development, land use control, and tourism that may have an impact on the proposed development.

B. ENVIRONMENTAL ISSUES

This section of the document primarily targets the environmental issues of critical concerns based on information provided in section A.

The following are the critical issues a high quality LLES will need to address for the development proposed by [COMPANY OR AGENCY].

The LLES will need to address:

4. FLORA AND FAUNA

For the project site and the zone of influence:

- 4.1 Collect base line data (field study) on the terrestrial and aquatic fauna and flora; rare or endangered species or commercially valuable species within or in areas adjacent to the project site; sensitive habitats within or adjacent to project site. This should provide a baseline from which to detect any changes in the abundance and vigor of species due to this development. Provide a general description of the methodology used to collect baseline data, this is, to include the date, time, area surveyed, and methodology used;
- 4.2 Estimate the acreage and type of vegetation within the development site designated and percent to be removed;
- 4.3 Identify measures to be implemented to mitigate for the loss of vegetation that might arise from the development;

FINAL DRAFT

- 4.4 Identify any specific measures for their protection of species of conservation significance (threatened and endangered species), which may include the establishment of reserves within the project site;
- 4.5. Identify any impacts on the nearby [PROTECTED AREAS AND WATERWAYS/WATER BODIES].

5. WATER

- 5.1 Determine the projected water needs for the entire development (including drinking water supplies, domestic/household supply, irrigation of landscape, etc.).
- 5.2 Assess all sources of water supply, quality and quantity, paying special attention to determining the safe maximum yield it can provide.
- 5.3 Establish a baseline on the water resources of the project area. This base-line should include water quality assessment of any proposed well water and surface waters within and adjacent to the project site. The base line should include, at a minimum, the following parameters¹⁵⁸:
 - i. Temperature;
 - ii. Conductivity
 - iii. Total suspended solids;
 - iv. Fecal coliform;
 - v. Total Nitrate (as NO₃- N);
 - vi. Alkalinity
 - vii. Dissolved oxygen
 - viii. pH;
 - ix. Sulphates;
 - x. Hardness;
 - xi. Total Phosphate;
 - xii. Biological Oxygen Demand
 - xiii. Chemical Oxygen Demand
 - xiv. Chlorine
- 5.4 Identify the preferred option for water supply needs, based on environmental grounds. Specify any residual impacts of meeting water needs through this option, their significance, and any mitigatory measures to be undertaken. Provide detailed information for any water treatment processes that may be employed to obtain the required volumes of potable water for the entire development.

6. LIQUID WASTE MANAGEMENT

- 6.1 Determine the nature, composition, source(s) and volumes of liquid waste, including sewage waste, grey water, and pool water to be generated by the entire project.

¹⁵⁸ Assays i, & vii, to be conducted in the field and the remainder to be conducted preferably by an independent water quality consultant. The water quality analysis should contain the official stamp of the laboratory (if any) and the signature of the lab technician.

FINAL DRAFT

- 6.2 Evaluate a minimum of two (2) options for the collection, treatment, recycling of the liquid wastes (if appropriate), and disposal of these effluents, identifying any chemicals planned for use in the treatment or management of these wastes.
- 6.3 Identify the preferred option(s) for liquid waste management, based on environmental grounds, including necessary infrastructure, designs, locations and land requirements. Specify any residual impacts of liquid waste management, their significance and any mitigation measures to be undertaken.

7. SOLID WASTE MANAGEMENT

- 7.1 Determine the nature and volumes of solid wastes to be produced by the entire development both during the construction and operation phase. Characterize and quantify all waste to be generated including waste oil, tires, plastics, metals, putrescent wastes, batteries/hazardous materials and construction wastes, at minimum. If composting of organic wastes is to be conducted, provide specifications on the location of the site and procedures to be followed for the composting.
- 7.2 Evaluate the various options which could be used to collect, treat, recycle and/or dispose of these wastes and determine the various impacts each option would have on the environment.
- 7.3 Select the preferred option(s) for the disposal of these materials. This should be based on environmental and public health grounds, and should specify residual impacts and their significance.

8. GEOLOGY AND EXTRACTION OF MATERIALS

- 8.1 Determine the type and volume of construction materials required for the entire development, including material for road construction, infrastructure needs, etc.
- 8.2 Evaluate options for meeting these needs, reviewing their sources, volume, extraction methods and transportation and identifying:
 - Direct and indirect biological impacts;
 - Direct and indirect physical impacts;
 - Impact on water resources;
- 8.3 Identify the preferred option for the extraction methods, source and Transportation of materials, specifying the necessary mitigation measures, their residual impacts and significance.

9. TRANSPORTATION AND RELATED INFRASTRUCTURE

- 9.1 Assess the type and volume of vehicular traffic expected during both construction and operational phases and indicate their impacts.
- 9.2 Provide a layout of the existing access road(s), bridges, drainage and culverts to the development site. Identify whether any new roads/trails will be required for the development.

FINAL DRAFT

- 9.3 Evaluate options for the provision of suitable roads/trails for the development, taking into account proper access and egress to the project site.
- 9.4 Select the preferred option for the provision of suitable roads/trails for the development. This will need to examine construction materials (types, sources, volumes, transportation) and methods in relation to their environmental impacts.
- 9.5 Recommend precise mitigation measures, based on the specific options selected, for the proper management of the vehicular traffic, roads and trails close to and within the project area.

10. ENERGY GENERATION

- 10.1 Determine the projected energy requirements for the entire development.
- 10.2 Evaluate a minimum of two (2) options for meeting the energy needs, using fossil fuel, solar, hydro, and wind resources (and others if appropriate). For each of these options, it will be necessary to investigate:
 - Fuel Storage;
 - Transportation;
 - Health and safety;
 - Pollution sources, volumes, and types;
 - Significance of any pollution that may result from energy generation;
- 10.3 Select the preferred option(s) for energy generation. This should be based on environmental grounds and should specify the residual impacts of generation of the preferred option, its significance and the mitigation measures to be undertaken.

11. SOCIAL FACTORS

- 11.1 Determine potential impacts on socioeconomic conditions taking into account factors such as:
 - Traditional resource users within the adjacent project area and zone of influence, if applicable;
 - Describe the potential social and economic benefits of establishing the proposed facility. Characterize the impacts in terms of type (beneficial or adverse), magnitude (high, medium or low), direct/indirect, duration (short, medium and long term, sporadic), avoidability and reversibility;
 - The LLES preparer will consult and report on the views and concerns of directly affected stakeholders such as nearby communities, local NGOs and relevant government departments/agencies regarding the development of the project.
 - Provision of basic health care and hygienic facilities for all workers during construction and operation of the project.
 - Fire protection;
 - Police/Security services.

12. ARCHAEOLOGY

- 12.1 Consult with NICH-Institute of Archaeology to determine if any known features of archaeological or cultural importance and provide recommendations for the protection of any features, if applicable.

13. EMERGENCY MANAGEMENT

- 13.1 Identify emergency preparation and response management measures for the proposed development inclusive of human health and safety, fire, flood, hurricane, spills, etc. This should include evacuation and hazard management plans inclusive of climate change adaptation measures (such as increase rain falls and structural designs conducive of climatic conditions of the project site).

- Human health and safety
- Fire
- Explosion
- Equipment malfunction
- Spillage/Chemical Accident, and
- Hurricanes

C. CONCLUSION/RECOMMENDATIONS

This section discusses the potential impacts (both positive and negative) and proposes alternatives to the execution of the project based on the information generated by Section B.

14. ALTERNATIVES FOR DEVELOPMENT

- 14.1 Present all reasonable alternatives for development in comparative form, exploring each alternative. Include the no-action alternative and the reason why certain alternatives were recommended or eliminated.

15. MITIGATION AND MONITORING PLANS

- 15.1 Based on the assessments, develop a mitigation matrix outlining mitigation measures for all potential negative environmental impacts including but not limited to construction activities, waste management, water quality, habitat alteration, etc.
- 15.2 Provide a monitoring plan to be implemented for the entire operation, identifying any agency/body responsible for its implementation. The plan should include monitoring of wastewater discharge characteristics (if any), changes in ecological species (including endangered species), contingency measures to emergency response to accidental events (fire, flood, hurricane, leakages, spillages, etc.).

ANNEX 9: MINUTES OF CONSULTATION SESSION WITH NGOS AND COMMUNITY REPRESENTATIVES

Date:	February 27, 2014	
Meeting started at:	9:30 am	
In Attendance:	Antoine Devonshire (AD)	Social Investment Fund
	Irving Thimbriel (IT)	MOWT
	Hugo Castillo (HC)	Sarteneja Alliance for Conservation and Development
	Heron Moreno (HM)	Corozal Sustainable Future Initiative
	Lester Delgado (LD)	Corozal Sustainable Future Initiative
	Arvin Coc (AC)	Belize Audubon Society
	Joseph Villafranco (JV)	TIDE
	Marcus Kingston (MK)	Cayo District Association of Village Councils
	Osmany Salas (OS)	BCRIP EMF Consultant
	Michael Somerville (MS)	BCRIP EMF Associate Consultant

-
1. OS welcomed participants to the BCRIP EMF consultation.
 - a. The consultation session participants introduced themselves.
 2. OS gave an overview of the agenda for the consultation session.
 3. AD presented on the background and overview of the BCRIP, including SIF's involvement with the Project.
 - a. The World Bank (WB) and GOB initially conducted a country assessment (NCRIP).
 - b. BCRIP is a spinoff of NCRIP that identifies vulnerable roads critical to Belize's economic development.
 - c. The idea is to make roads and associated road infrastructure more resilient to climate change.
 - d. The GOB also has other projects (funded by sources other than the WB) ongoing that are addressing roads (some of which are within the 4 BCRIP priority geographical areas).
 - e. The BCRIP will cost about \$30M.
 - i. HM commented that \$30M is not a lot for road works. He further asked if there is a minimum standard for road building.
 - ii. IT reiterated that roads in other areas of the country are being addressed with funds from elsewhere, and that all roads built in Belize are built to AASHTO (American Association of State Highway and Transportation Officials) standard. He further noted that there is a shift to new road building standards as a result of the unprecedented impacts to roads due to climate change.
 - f. AC said that the BCRIP is especially good for the country of Belize because it can be used as an example to improve other areas.
 - g. OS mentioned that the BCRIP is not for new roads but to improve existing roads.

FINAL DRAFT

- h. JV, HM, and HC asked who is coordinating the Project. AD said that the SIF is the implementing agency.
 - i. HM mentioned that road maintenance is a concern, especially in the North (Corozal/Sarteneja Area).
 - i. IT admitted that low road maintenance by the MOWT has been due to shortage of funds. He further acknowledged that the MOWT is lacking the contour maps at the scale needed and this has hampered road designs (e.g. culverts misplaced, etc.). He also mentioned that roads will be better designed as a result of the new standards for resilience to climate change, and that the data coming from the National Meteorological Service is better now.
4. IT presented on the types of sub-projects.
- a. The MOWT physically went out in the field to collect data.
 - b. Some redundancy has to be built in (e.g. bridges in certain areas cannot be relocated).
 - c. Areas vulnerable to flooding will be built up and proper drainage systems will be installed.
 - i. JV asked if the MOWT considered land-use and use of rivers (e.g. flash floods, percolation, gravel mining) when building roads.
 - 1. LD said water drainage and water flow are legitimate concerns in the North (where the terrain it is flat) because of rapid development, especially in the Mennonite communities.
 - 2. AD commented that hopefully the BCRIP will encourage the relevant GOB agencies to better manage land in Belize.
 - 3. OS noted that the BCRIP Environmental Management Framework would be good for use in all areas of Belize.
 - 4. ET said land-use studies are indeed on-going within the MOWT, and that the funds allocated for the Project will be effectively utilized.
 - ii. MK asked about road priorities and whether the Actun Tunichil Muknal road (that is in very bad condition) was considered in the BCRIP.
 - 1. AD said that economic development (e.g. investments) and disaster response (e.g. evacuation) were the main considerations for selecting roads.
 - 2. OS mentioned that priority areas were selected based on the Multi-Criteria Evaluation (MCE) conducted, and that some areas in apparent desperate need for upgrade will not be attended to under the BCRIP.
 - 3. AD also mentioned that limited funds also determine what all can be done.
 - iii. HM remarked that other services within communities could also be done (e.g. shelter improvements).
 - 1. AD said other funds can be used for these.
5. OS presented on the purpose of the EMF.
- a. It is a framework for environmental management in the implementation of BCRIP sub-projects;
 - b. It assesses potential adverse environmental issues or impacts and proposes mitigatory measures;
 - c. It establishes clear procedures and methodologies for environmental planning;

FINAL DRAFT

- d. It specifies roles and responsibilities for the various entities involved.
6. MS presented a summary of the EMF baseline environmental characteristics.
 - a. JV asked if there was any consideration for invasive species.
 - i. OS and MS noted that this will be looked at in more detail.
 - b. JV commented that road slopes in some areas of the country are very steep.
 - c. HM mentioned that where road building material is coming from should also be an environmental consideration.
 7. OS presented the relevant WB safeguard policies.
 - a. Natural habitats, protected areas, cultural resources (chance find procedures), projects in disputed areas, safety of dams (dam safety framework).
 - i. AC mentioned that consideration should be given for the Central Belize Wildlife Corridor, and dam influences on communities within the Belize River Valley Area.
 8. OS presented on the relevant national laws and regulations considered for the BCRIP.
 - a. HM commented that land-use regulations were not included.
 - i. OS and MS noted that this will be included.
 9. OS presented the environmental categorizations.
 - a. According to Environmental Impact Assessment (EIA) regulations, projects fall into 2 distinct categories.
 - b. Category 1 (or Schedule I) for those requiring full EIA; or Category 2 (or Schedule II) for those that should undergo a screening process to determine the level of assessment necessary.
 - c. The BCRIP sub-projects will not require an EIA but a Limited Level Environmental Study (LLES) at the most.
 - i. JV asked whose regulations supersede: Belize's or the WB.
 1. OS clarified that the project will follow the more stringent policies, whether these are GoB regulations or World Bank's. So neither one supersedes the other, rather the policy that has the most environmental safeguards protection takes precedence, whether it is World Bank's or GoB's.
 - ii. AD mentioned that since alteration of riverbanks and modification of stream flow will possibly occur, how come only an LLES is required and these works are mentioned under Schedule I projects requiring an EIA.
 1. OS and MS mentioned that Schedule I category are for major waterworks only. The DOE is of the opinion that the BCRIP subprojects are all Schedule II (or Category B).
 10. OS presented the possible environmental impacts of the BCRIP sub-projects.
 - a. AC asked what land loss means or where land loss is expected to occur.
 - i. OS mentioned that land can be lost as a result of alteration of road reserves (clearance of vegetation and digging of drains).
 - b. AC mentioned that the CTWS is a RAMSAR site and should be acknowledged as such in the narrative.

FINAL DRAFT

- c. HM mentioned that workers that set up camps and settlements will also be inclined to impact the area by lighting fires and engaging in hunting.
11. OS presented the various steps of the environmental screening process.
- a. All BCRIIP sub-projects are classified as Category B.
12. MS presented the recommended mitigation measures for the possible impacts due to road works.
- a. HM noted that the paved roads in Belize look different from those in Mexico.
 - i. IT mentioned that due to expense, Belize has been using the chip-seal method, which basically involves spraying the road surface with the asphalt emulsion and then applying a layer of crushed rock or gravel. In Mexico they mix the asphalt emulsion with finely-crushed aggregates then spread this on the surface of the road.
 - b. AD asked who will monitor pollution.
 - i. MS noted that this will be laid out in the LLES document from the Department of the Environment.
 - c. IT noted that the concentration of hydrogen sulfide in the asphalt used in Belize is minimal, and that the new OSHA laws for Belize will help protect workers from air emissions, and other occupational safety and health considerations.
 - d. OS mentioned that some mitigation measures (e.g. noise abatement) will be the responsibility of the contractors, and this would need to be built into the road improvement contracts.
 - e. JV mentioned that an education campaign can be conducted to inform the public about issues and provide an avenue through which they can file complaints.
 - f. MK mentioned that wetting of roads used to be done in the past and should be continued.
 - g. AC said that the time of day or night used to carry out road works could be adjusted to minimize annoyance to residents.
 - h. JV asked if there has been any consideration for sustainable road maintenance measures.
 - i. AD said that the GOB is currently looking at the possibility of collecting toll for the use of certain roads.
 - i. HC asked about the length of the maintenance phase after road work is completed.
 - i. IT mentioned that the MOWT conducts periodic road monitoring and maintenance and reiterated that funds collected from toll roads will help to cover this cost.
 - j. JV noted that signage needs to be improved throughout.
 - i. OS mentioned that public awareness can be beefed up to address signage issues, etc., and that awareness needs to go beyond just the environment, and maybe to address civic pride and individual responsibilities as well.
 - ii. AC asked whether there are guidelines for vandalism of signs.
 - iii. HM said that NGOs can maintain signs through working along with the MOWT.
13. OS presented about procedures and responsibilities and the entities that will be involved in the implementation of the EMP.

FINAL DRAFT

14. OS presented on dialogue and disclosure.
 - a. This involves consultation with communities and incorporating their feedback.
15. OS presented the list of annexes to be included in the EMF document.
 - a. A Dam Safety Framework will also be included.
16. OS wrapped up the consultation session by talking about the next steps for the EMF.
 - a. Participants were asked to take time out to review the Draft EMF and send feedback that will be incorporated into the EMF Final Draft.
17. The consultation session ended at 12 noon.

ANNEX 10: MINUTES OF CONSULTATION SESSION WITH GOB REPRESENTATIVES

Date:	Mar. 05, 2014	
Meeting started at:	9:30 am	
In Attendance:		
	Rasheda Garcia (RG)	Forest Department (Protected Areas Coordinator)
	Howard Cabral (HC)	BECOL (Safety, Health and Environment Coordinator)
	Jorge Franco (JF)	DOE (Head of Environmental Impact Assessment Unit)
	Osmany Salas (OS)	BCRIP EMF Lead Consultant
	Michael Somerville (MS)	BCRIP EMF Associate Consultant

-
1. OS welcomed participants to the BCRIP EMF consultation session.
 2. OS gave an overview of the agenda for the consultation session.
 3. OS presented on the background and status of the Belize Climate Resilient Infrastructure Project (BCRIP), including the Social Investment Fund's (SIF) involvement.
 - a. A National Climate Resilient Investment Plan (NCRIP) was prepared by the GOB.
 - b. BCRIP is a smaller component of NCRIP that identifies and prioritizes primary and secondary roads vulnerable to flooding and highly critical to Belize's socio-economic development.
 - c. A Multi-Criteria Evaluation (MCE) was conducted and 4 priority geographic locations were identified. The actual works or sub-projects will be selected from these priority areas.
 - d. As part of the BCRIP, and before the World Bank (WB) loan can be disbursed to the GOB, 3 associated frameworks are being prepared. These comprise a Social Management Framework (SMF), an Environmental Management Framework (EMF), and a Dam Safety Framework (DSF) to be included in the EMF.
 - e. The BCRIP will be financed by a \$30M loan from the WB, \$20M of which will be divided among the 4 priority areas.
 - i. HC commented that the studies alone, conducted before road works are carried out, can be very costly.
 - f. OS continued by pointing out that the criteria identified in the MCE were further weighted by a technical team and the CEOs of various Ministries, and in many instances, the CEOs weights took precedence.
 - i. JF asked if standardized criteria were used to determine specific project sites.
 - ii. OS mentioned that at this point, only a framework approach is being used. The Specific sub-projects have not yet been determined, as this is not necessary prior to Project appraisal.
 1. JF asked why go through all this work and then allocate monies that will not be enough. The better approach would be to identify key projects from the start.

FINAL DRAFT

- g. OS continued by adding that the SIF is also preparing an Operations Manual that will set out procedures for implementing the BCRIP.
 - h. The Social scientist (Valentino Shal) is currently collecting data from the relevant communities.
 - i. OS presented the Project Overview.
 - i. Primary and secondary road segments in the 4 priorities areas considered are: the Greater Belize City Area, West of Belmopan Area, Northern Area around Corozal, and the Southern Area around Independence). Red denotes high criticality roads and green denotes low criticality roads.
 - 1. HC asked if money played a role in selection process
 - a. OS said yes; economic development is one of the two main considerations. Vulnerability to flooding is the other.
 - i. JF commented that there might be a project to raise the Buttonwood Bay road to 3 meters above sea level, and if this is done all the other surrounding roads will be flooded except this one road.
 - ii. OS reiterated that specific sub-projects are not currently specified.
 - iii. JF mentioned that the main highway from Guanacaste National Park to the Belize/Guatemala border is already funded for reconstruction, so the Project might want to consider focusing on the feeder roads in this area instead.
 - iv. HC commented that roads in Belize do not appear to be to any standards, and that there are now new methods how to construct solid roads.
 - 1. OS mentioned that in the consultation session with the NGOs and community representatives, Irving Thimbriel (MoWT) mentioned that the GOB is currently looking at the possibility of collecting toll for the use of certain roads and that this can help pay for road maintenance.
 - a. HC commented that a major highway should not be tolled. The Main problem with roads is drainage. If drainage is poor, water will undermine a road's integrity.
 - b. JF asked if a comprehensive hydrological flow pattern study is conducted when road works are conducted, utilizing contour maps, etc.
 - i. MS mentioned that Mr. Irving Thimbriel from the Ministry of Works (MoWT) acknowledged (at the consultation session with the NGOs and community representatives) that the Ministry lacks the proper contour maps at the scale needed and this has hampered road design.
 - c. OS mentioned that drainage and water flow are legitimate concerns, especially in the Northern Belize where the terrain is flat and where there are rapid development by the Mennonite communities taking place.
- v. OS continued by mentioning that road reserves are established for the network of roads in Belize.
 - 1. JF said all homeowners are now required to give up at least 20 feet in front of their property. This is in addition to the 40, 60, or 100 feet reserves set out in the Land Utilization Act (LUA) guidelines.

FINAL DRAFT

- j. OS presented the types of sub-projects.
 - i. The proposed works will be undertaken along existing roads, and will not traverse critical natural habitats or Protected Areas or Reserves. The Project will include safety measures (such as speed bumps) in areas that are densely populated, near schools, or in the vicinity of nature reserves.
 - 1. HC mentioned that small-scale creek alignment and other waterworks could lead to major problems, and that the contractor might have to go back and undo the works that were initially done.
 - 2. JF mentioned that screening will be looked at more in detail when SIF presents the details of the sub-projects, so it cannot be said if an LLES will be necessary at this point.
 - 3. JF also mentioned that the SIF cannot conduct environmental screening for sub-projects, and that the way the EMF document is currently written is indicating that the SIF can do so.
- 4. OS presented on the purpose of the EMF.
 - a. It is a framework for environmental management in the implementation of BCRIP sub-projects.
 - b. It assesses potential adverse environmental issues or impacts and proposes mitigation measures.
 - c. It establishes clear procedures and methodologies for environmental planning.
 - d. It specifies roles and responsibilities for the various entities involved.
- 5. MS presented a summary of the EMF baseline environmental characteristics.
 - a. Characteristics for the Physical Environment include geology; soils; topography; climate; ambient air quality and existing sources of emissions; surface and groundwater hydrology; and existing water pollution discharges. Characteristics for the Biological Environment include flora and fauna; rare or endangered species; species with potential to become nuisances, vectors or dangerous; and sensitive habitats including protected areas.
 - i. JF said that the words “water pollution” should be taken out and substituted with the word “effluent.”
 - ii. OS mentioned that impacts to roads could come from other anthropogenic sources as well, for example where vegetation clearing on steep slopes exists.
 - 1. JF noted that the specifics of who is responsible for monitoring impacts should be clearly mentioned. The SIF is not a regulatory body, and the DOE will require financial assistance from the SIF to carry out monitoring.
- 6. OS presented the relevant WB safeguard policies.
 - a. This is why the EMF is being done.
 - b. Safeguard policies triggered include environmental assessment, natural habitats, physical cultural resources, projects in disputed areas, and safety of dams triggered as a precaution.
 - c. Chance find procedures are incorporated under the physical cultural resources safeguard policy. It outlines procedures that the contractor must follow in the event cultural resources are discovered, example contact the Department of Archaeology.

FINAL DRAFT

- d. Under the safety of dams safeguard policy, a dam safety framework (DSF) has been developed that will be included in the EMF. The outline of the DSF was shared.
 - i. HC mentioned that BECOL is currently working on classifying and certifying its dams.
7. OS presented on the relevant national laws and regulations considered for the BCRIP.
 - a. The Environmental Protection Act (EPA) and Environmental Impact Assessment (EIA) are the primary ones.
 - b. The Public Roads Act is an interesting one in that it gives the Chief Engineer authority to do many things that in and of themselves may cause additional impacts.
 - i. JF mentioned that the EPA supersedes any other authority when it comes to protecting the environment, and that the DOE has always had good rapport with the MoWT.
 - c. The LUA will be added to the list.
8. OS presented the environmental categorizations.
 - a. According to the EIA regulations, projects fall into 3 distinct categories.
 - b. Category 1 (or Schedule I) for those requiring full EIA; Category 2 (or Schedule II) for those that should undergo a screening process to determine the level of assessment necessary; and Category 3 for those projects that do not require an EIA.
 - i. JF said that Category 3 will basically entail a list of the types of projects that the SIF will submit to the DOE for environmental clearance. Based on this, the DOE will determine if any of the projects are schedule I or II.
 - ii. JF also mentioned that all of the BCRIP sub-projects will need to undergo environmental screening to determine the level of study required, if any. This needs to be mention in the EMF document.
 - iii. JF continued by mentioning that some Project works might be larger than anticipated, and this is why they should be screened. For example, some waterworks might require road realignment.
 - iv. JF said that the SIF and MoWT should prepare a detailed project proposal of sub-projects to submit to the DOE (this is to be included in step 1 of the environmental clearance process). Each sub-project will be treated separately unless they are mentioned as amalgamated in the detailed project proposal. An EIA may be triggered within the environmental clearance process.
 1. OS mentioned that the DOE environmental clearance process flowchart can be adapted for this purpose.
 - v. JF said that the SIF is identified as the developer for the BCRIP.
 - vi. JF said a rapid ecological assessment (REA) can also be included in the environmental clearance process, and suggested the use of the words “environmental study” instead of “environmental impact assessment.”
 - vii. OS pointed out that public consultation is also a requirement of the EIA process.
 - viii. RG asked at what point the BCRIP would decide what the key areas would be.
 1. OS said that this is not known at this point.
 - ix. JF mentioned that it should be noted in the EMF that the DOE require fees from the developer for processing and monitoring.
9. MS presented the possible sub-projects’ impacts and recommended mitigation measures.

FINAL DRAFT

- a. JF suggested using different wording for “Loss of Land,” and mention that it should be stated where the vegetation debris will be removed to.
 - b. JF also suggested using the word “clearance” instead of “removal” in “removal and alteration of vegetation;” and use the word “minimize” instead of “keep” in “Keep asphalt from getting into waterways and non-paved areas.”
 - c. JF also mentioned that for soil erosion and siltation, a mitigation measure can be included that states that environmental footprint should be minimized by clearly demarcating work area.
 - d. JF said that for workmen’s camps and settlements, a mitigation measure could state that existing camps will be utilized and the amounts of campsites should be minimized.
 - e. JF also said that the various types of wastes generated as a result of workmen’s camps and settlements should be mentioned.
 - f. JF suggested that for dust and air emissions, a mitigation measure could state that idling of equipment should be discontinued.
 - g. HC remarked that speed bumps might not be necessary at bird congregation areas but that bird congregation signs should be installed.
 - i. JF commented that speed bumps are best used on long segments of roads.
10. OS presented about procedures and responsibilities and the entities that will be involved in the implementation of the EMP.
- a. JF mentioned that the specific roles of the agencies should be integrated.
11. OS presented on dialogue and disclosure.
- a. This involves a consultation with communities and incorporating their feedback.
 - b. Consultation publications should be readily available.
 - c. OS asked if these can these be put on the DOE website.
 - d. JF said yes, this can be done through the DOE’s Public Awareness Unit but it has to be funded.
12. OS presented the list of annexes to be included in the EMF document.
- a. A Dam Safety Framework and a sample EMP format will also be included.
 - i. A Draft has been sent to the WB and the SIF. A copy will also be sent to BECOL, the Forest Department, and the DOE.
 - ii. JF mentioned that the DOE has an environmental checklist for the various application forms that can be included as an annex. None of the checklists might be specifically applicable to the EMF but one can be developed and get endorsed by the DOE.
13. OS wrapped up the consultation session by presenting the next steps for the EMF.
- a. Participants were asked to take time out to review the Draft EMF and send feedback that will be incorporated into the Final Draft.
14. The consultation session ended at approximately 12:00 noon.