
SECTION SEVEN

DISASTER MANAGEMENT AND CONTINGENCY PLAN

7.1 Introduction

The project proponent plans to develop and implement a Disaster Management and Contingency Plan for the project aimed at identifying the different potential disasters that could impact the development. The term ‘disaster’ is loosely used in this section and is referred to as any incident, accident, or natural occurrence that could affect the operation of the project in whatever way. This plan will focus on five potential types of disasters that can arise from various sources and affect the operation and livelihood of the project in any form or fashion. The five types that are referred to are both anthropogenic and natural in origin.

7.1.1 Management Structure

It will be the responsibility of the developer and residents to formulate an Emergency Committee for the project to address the potential disasters outlined in Table 7.1. This committee will elect an Emergency Coordinator or his/her designate who will chair and oversee the preparation activities in relation to the potential disasters described (See Table 7.1). Considering that the development density is relatively large, the proposed project will utilize the most suitable and qualified human resources to implement this committee.

The emergency committee must conduct periodic meetings to address important issues concerning the disaster management plans. Such important issues should be the objectives of the committee, their roles and responsibilities, updates, training, drills as well as their terms of reference (TOR) which they will abide by.

The Emergency Committee will also decide on the election policies for the assistants and coordinators. Furthermore, the committee must submit any disaster reports to upper management and authorities if required.

7.1.2 Disaster Classification

Disaster Management (or Emergency Management) is the discipline of dealing with and avoiding risks. It is a discipline that involves preparing, supporting and rebuilding when natural or human made disasters occur. The actions (efforts to avoid or ameliorate the impact) taken depends in part on the perceptions of the risk. In any event, an effective emergency management system will rely on the emergency plans available.

The project proponent plans to develop and implement the plan to address the different potential disasters. With this in mind, following table outlines some of the more likely disasters that could occur on site.

Table 7.1 Summary of the Potential Disasters and Response Plan

Disaster	Description	Response Plan	Stages
Hurricanes and tropical storms	These natural phenomena can vary in strength and drastically affect the project's infrastructure thus affecting the operation of the project.	Hurricane Preparedness Plan	Alert, Response, Recovery
Fire	Just like hurricanes, fire outbreaks can vary in size and location and causing irreparable damage to the project's infrastructure as well as affect the occupants	Fire Prevention and Response Plan	Response
Fuel/oil Spills and leaks	This incident could pose a serious impact to the receiving environment in which the project site is located. This is important considering the fuelling stations and marina operation.	Spill Contingency Plan (Tier levels)	Response, Recovery
Climate Change	This slow occurring natural occurrence can pose serious risks to the project if not monitored over time.	Sea Level Rise Contingency Plan	Alert, Response
Medical	Medical emergencies can occur at any moment without notice and therefore requires a quick and coordinated effort to respond to this need.	Medical Emergency Plan (Transportation and Evacuation)	Response, Recovery

7.1.3 Management Programs and Plans

It is expected that once in operation, the anticipated Bellcan Golf Resort & Marina will develop a more comprehensible and detail plan that will address the five aforementioned potential disasters and plan accordingly in order to mitigate and ameliorate any negative effects these types of disasters could have on the infrastructure and management of the development. This component is important as the proposed venture will be a high density development that will sustain a relatively large population when in operation.

Thus the incidence of anthropogenic disasters occurring increases with increased human population. In addition, considering the project location, hurricanes and storms are a frequent occurrence in these areas with Hurricane Dean in 2007 passing just miles northwards of the site. Nevertheless to say, the development will formulate the appropriate response plan to respond to such disasters and contingency measures.

7.2 Hurricane Preparedness Plan (Evacuation Plan)

The hurricane preparedness plan will involve an alert, response and recovery stage to deal with any natural disaster involving hurricanes, storms or tropical depressions. This is the most common natural phenomenon occurring in Belize and the only one that would require a full scale evacuation. Belize lies within the hurricane belt, and is vulnerable to high wind and storm surge. During the past 100 years, Belize has been hit several times by major hurricanes. Belize has been hit 40 times by storms ranging from tropical depressions to hurricanes (Usher, 2000). The return period for storms since 1870 is three (3) years, and the vulnerability increases from north to south (Usher 2000). The hurricane season in Belize commences officially on June 1st and ends on November 30th.

The Hurricane Preparedness Plan (HPP) is aimed at making reasonable preparations should the project be threatened by an imminent Tropical Storm or Hurricane strike. This is to enable the project to protect the residents, the guests, employees, boaters and assets, and also to ensure that the project is able to continue to function after the hurricane has passed. For this plan to be effective the staff is required to review the plan every year prior to the beginning of the Hurricane Season. There will also be simulation exercises in relation to various elements of the plan.

7.2.1 Purpose of Plan

The main purpose of this hurricane preparedness plan is to:

- (i) Establish the coordinating mechanisms necessary to prepare and implement measures to safeguard property and lives of all concerned during the threat of a storm or hurricane.
- (ii) Increase awareness to management and others (lot owners, guests, staffs, boaters and visitors) of the need for hurricane preparedness,

The basic overall responsibilities of the management is to ensure that the coordinating mechanism that will ensure maximum safety of property and lives during an incoming storm, is put in place, and to make sure the developer or residents/guests are familiar with the mechanism. This mechanism also extends to the marina which will require its own particular response plan.

7.2.2 Information System

The “official alert” system for a storm or hurricane entails the coordination between management, the National Emergency Management Organization (NEMO) and the Belize National Meteorological Service (NMS). The Emergency Coordinator will therefore activate the required hurricane plan. The proposed project will follow the official alert and hurricane categories profile put in place by NEMO. Such categories along with the wind speeds are illustrated in the following:

Tropical Depression	29 mph – 38 mph
Tropical Storm	39 mph – 73 mph
Hurricane Category 1	74 mph – 95 mph

Hurricane Category 2	96 mph – 110 mph
Hurricane Category 3	111 mph – 130 mph
Hurricane Category 4	131 mph – 155 mph
Hurricane Category 5	Above 155 mph

The proposed Bellcan Golf Resort and Marina will observe the official Warning Flag System as follows:

Flags	Phases
One Red Flag	Preliminary Alert Phase (Storm/Hurricane Watch)
One Red flag with Black Center	RED I Phase (storm or hurricane watch)
Two Red Flags with Black Centers	RED II (Warning Phase)
One Green Flag	Green Phase (ALL CLEAR)

7.2.3 Pre-Season Preparation

At the beginning of May each year the Emergency Committee will ensure that all the required hurricane items are available and properly maintained ready for use. The Emergency Coordinator will ensure that all of these equipments are checked and available at all times during the hurricane season. The Emergency Coordinator will also ensure that all buildings and assets such as equipment, boats and vehicles are photographed (digital with date) at the beginning of each hurricane season, for possible insurance claims.

7.2.4 Implementation Plan during Threats

Preliminary Alert - Hurricane Watch

This is the First Phase, and means that a storm or hurricane may threaten within 72 hours. A storm or hurricane is within 21° N 80° W of Belize.

Actions to be Taken:

- (i) The Emergency Committee should be prepared to convene and take action if the NEMO/NMS issues a warning.
- (ii) Stay informed by radio and television of the storm progress.
- (iii) Obtain hurricane tracking chart for Committee members and project management,
- (iv) Obtain the contact number from the Management, and residents and guests with marine vessels, and inform vessel owners of the alert phase,
- (v) Ensure that contact is made with all residents, guests and captains of vessels, whether by direct or indirect means, to alert them of the phase and to make initial contact.
- (vi) Prepare a checklist (electronically) of items required in the event of a strike.

- (vii) The Emergency Coordinator will identify and categorize items or equipment to be removed as follows: list of equipment to stay, and list of those to be removed to designated site.
- (viii) Prepare a list of all the residents, guests and management staff on the project site.

Hurricane Warning – Red 1 Phase (Watch)

During this phase, a hurricane may threaten within (36) thirty-six hours. A hurricane or storm is located within 20° N 85° W.

Actions to be taken:

- (i) Advise all vessel Captains to leave the marina areas immediately and take their vessel to safe harbor (Rio Hondo) or properly moor their boats at a designated location.
- (ii) The Emergency Coordinator will advise all residents to install their hurricane shutters.
- (iii) Advise all residents of the project site including guests and employees to be prepared to evacuate the area upon the recommendations of NEMO.
- (iv) Identify official shelter for guests and any other employee in need of such shelters,
- (v) Management will identify employees to report to work after the hurricane or after the Green Phase all clear is given.
- (vi) Update NEMO on all actions taken.

Hurricane Warning – RED 2 Phase

Whenever Phase 2 (Red) is given, this means that a hurricane is likely to strike Corozal Town within (24) twenty-four hours.

Actions to be taken:

- (i) The checklist of items required will then be printed and each head of sections will be provided with a checklist,
- (ii) The precautionary list will be printed and provided to each head of sections,
- (iii) Final hurricane preparations should be concluded
- (iv) Evacuation of employees, guests and residents should be completed

Fourth Phase – Green (All Clear)

This is the ALL CLEAR, which will be declared by NEMO after the hurricane has passed and it is safe to return to review the effects of the hurricane.

Actions to be taken:

- (i) The Emergency Committee will attempt to return and survey the project site as soon as possible,
- (ii) The Emergency Committee will immediately make a brief report on all damages (supported with photographs), and prepare an estimate of damages, and submit the same to NEMO and Management for their perusal.
- (iii) Employees of the project will report as previously advised.
- (iv) Clean-up phase will commence with the assistance of project employees, and all available human resources, where possible.

7.2.5 Marina Hurricane Preparedness Plan

In the event of a threatening hurricane, the following procedures must be adhered to. The Harbor Master is ultimately responsible to ensure that the necessary precautions are taken. In his absence, the Harbormaster, or another assigned individual is responsible.

Hurricane Alert

48 hours before anticipated effect, the Harbormaster will ensure that:

- All equipment that will be needed is in place and operational
- Boat owners/operators are informed of any threatening hurricane at the appropriate time and advised to move their boats to a safer location landward of Corozal Town and Rio Hondo.
- Boat owners/operators are updated on all weather advisories
- Vessels are secured properly
- Unattended vessels left in the marina are checked to ensure that they are tied and properly secured

Hurricane Watch

24 hours before anticipated effect, the Harbormaster will ensure that:

- All tanks are filled and additional fuel is available

- The project's boats are filled with fuel
- All fuel lines are turned off
- All boats are removed from the docks and placed in a safe location
- Garbage lids, loose and hanging objects are secured
- Wheel buggies, carts and miscellaneous items are secured

Hurricane Warning

12 hours before anticipated effect, the Harbormaster will:

- Re-check to ensure that all loose items are properly secured indoors, making sure that there is nothing lying around that could potentially be turned into a flying missile
- Reach out to all boaters in the general area and advise them that the hurricane is approaching the coastline via VHF radio
- Lower all antennae
- Not accept reservations for boat slips
- Drain all fuel out of the fuel tank lines
- Only allow distressed boaters/emergency situations into the marina during this time
- Re-check all boats in the marina to make sure that they are securely tied down
- Ensure that all boat owners have signed existing waivers

7.3 Fire Prevention and Response Plan

The fire prevention and response plan will focus on the possibility of a fire and any fire outbreak, whether large or small, that might occur. It is therefore important to consider its likelihood and the developer will develop a response plan aimed at addressing the awareness and the mechanism necessary for response.

Presently, there is fire service provided for Corozal Town, however, the proposed development will install its own fire-fighting equipment, thus providing a quick response as well as service via the Emergency Committee in the form of engineering controls (fire protection equipment and building design) and the fire prevention plan. This plan will also be applicable to the marina.

7.3.1 Purpose of Plan

The purpose of the plan is to ensure that the coordinating mechanism that will ensure maximum safety of property and lives during a blaze, is put in place, and to make sure the developer, residents, guests and captains are familiar with such mechanism. The purpose of the Fire Prevention and Response plan for the proposed project is to:

- (i) increase awareness to residents, guests, management, boat captains and others of the need for a fire prevention and response plan,
- (ii) To establish the coordinating mechanisms necessary for management to prepare and implement measures to safeguard property and lives of all concerned should a fire occur in a building, residence or structure,
- (iii) Work along with the Corozal Fire Service and other interested parties on the needs, demands and response time as well as any training.
- (iv) Indicate all possible evacuation routes for each residence and other buildings on the property.
- (v) Implement a prevention plan aimed with stakeholders

7.3.2 Fire Protection Equipment/Systems

The anticipated project will invest and install protection systems to protect lives and property which are summarized below:

1) *Fire alarm detection and notification systems.*

- *Smoke detectors:* The project will install fire detection equipment in the form of smoke detectors in each of the residence, hotel units, recreational areas, marinas and other areas of interest. The smoke detectors will activate the smoke alarm possibly signaling a fire or something burning.
- *Manually activated pull station:* The restaurant, hotel and administrative building as well as the Harbor Master Building will have a manually activated pull station in the event that someone sees a fire. It is essential that all guests, residents, visitors and staff are aware of these warning devices and their potential use in notifying residents of a fire.

2) *Fire Suppression Systems.*

- *Hydrants:* Fire hydrants will be used on the project as a means of fighting fire. The proposed project intends to install several fire hydrants around the development. These hydrants will be spaced out according to each development phase. In other words, each phase will have their own hydrant loop, and each phase will be connected to each other via valves. Water for these hydrants will be gotten either from the treated and post chlorinated wastewater via a buried recycle line from the package plants or from the water storage tank and sea. Pumps will be used to pressurize the fire hydrant loops. Flexible water hoses will be coupled to the hydrants and used to extinguish the fire.

- *Fire Extinguishers:* The Belcan Golf Resort & Marina will install multi-purpose dry chemical (Class ABC) fire extinguishers. Dry chemical extinguishers will range in sizes of 5 lbs to 10 lbs and will be installed in key areas such as hotels, clubhouses, spas, containment walls, generators, electrical panels, maintenance areas, etc.

As part of the general rule regarding the use of fire protection equipment and systems, the Emergency Committee will also be responsible for the maintenance of such equipment, especially the fire extinguishers and smoke detectors.

7.3.3 Fire Prevention

Fire prevention is an important aspect in precluding its occurrence. While water is plentiful at the project site, its immediate availability may not be possible. Measures designed to prevent and control fires include:

I. Use of fire retardant material - The use of nonflammable building material will be encouraged within the project. For example the use of sheet roofing instead of shingles will be encouraged along with the use of fire rated doors, fire resistant windows and barriers.

II. Qualified personnel to install electrical systems - Only certified Electricians will be allowed to carry out any electrical work on the premises. Each building, after completion should be approved by the PUC.

III Building Codes - The project will call for the construction of residential buildings and others, with heights above two (2) and possibly three (3) stories high. A set of building codes will be developed by the engineers of the project, in order to ensure adequate construction of buildings. The engineering standards will also include provisions for adequate and safe wiring; plumbing, heating, and cooling systems will also be in conformity with acceptable national building codes.

7.3.4 Fire Response

As mentioned previously, fire outbreaks are unpredictable but can be prevented. It is difficult to portray a response plan for the project site considering the different scenarios that might arise from a fire. It is important though, to have in mind certain tips and guidelines relating to the event of a fire. These guidelines may come in the form of a fire combating plan whereby trained staff may utilize the different fire controls to extinguish the fire.

Fire outbreaks sometimes require an evacuation plan. This plan is important and must address congested areas such as the hotels, commercial/retail areas, marina, restaurants, bars and other buildings.

Belcan Golf Resort Fire Response Plan

In the advent of a fire (small fires)

Fires usually start small and then grow large as time progresses and if there is enough fuel, oxygen and heat to stoke the fire.

Actions to be taken:

- (i) Sound the alarm
- (ii) Use an extinguishing media preferably a fire extinguisher to fight the fire.
- (iii) Do not fight a large fire with a fire extinguisher.
- (iv) Check to see that the fire is completely extinguished.
- (v) Inspect the fire area and assess for damages.
- (vi) Close off the area for safety purposes.

At some point, the Emergency Coordinator needs to be notified of the situation. A report of the incident should be submitted to the Emergency Committee for assessment.

In the advent of a large fire

Utilize these procedures if a large fire occurs in a building unit or elsewhere

Actions to be taken:

- (i) Sound the Alarm
- (ii) Notify the Corozal Fire Service Immediately
- (iii) Evacuate any persons within the area or found in the area at the time of the incident
- (iv) Use an extinguishing media such as a fire extinguisher (only if it is small) and fire hydrant to fight the fire.
- (v) If possible, remove any fuel (combustible material) that could be engulfed by the fire
- (vi) Use fire hoses and hydrant and full pressure aiming at the base of the fire
- (vii) Once contained, check if the fire has been completely extinguished
- (viii) Inspect the fire area and assess for damages

At some point, the Emergency Coordinator needs to be notified of the situation. A report of the incident should be submitted to the Emergency Committee for assessment. Notify any member of the National Fire Service for further investigation and recommendation.

Bellcan Marina Fire Response Plan

1. Any person who discovers a fire or smoke should report it immediately to the Bellcan Golf Resort & Marina Security Booth or the Harbor Master or hailing either of the above on VHF Radio. If there is no telephone nearby, activate the fire alarm station located nearest to you and then go to the nearest telephone and call the Security Booth or the Harbor Master Office. If you have a VHF radio, communicate the problem as a distress call.

2. When speaking to the Harbor Master or the Security Officer, give them the exact location of the fire or suspected fires. A marina staff member will notify the Corozal Fire Department and Emergency Committee and dispatch a response team to the affected area.
3. If the fire can be easily and safely extinguished, do so utilizing the marina fire extinguishers and fire hydrants, then advise the Security Booth and Harbor Master Office immediately.
4. If imminent danger exists, advise the Security Booth or Marina that you are leaving the area, and then retreat to a safe area.

Evacuation Procedures

Should the Fire Department, Police, Marina Manager, Director of Security, or Harbormaster at the scene recommend that the area be evacuated, the following plan must be put into effect:

The Marina and security personnel will manually give the signal for evacuation utilizing VHF radio communication.

- An alternative signal will be broadcasting a message utilizing the marina VHF.
- The message given to Boaters on their boats in the marina should be: *“There is an emergency that requires the immediate evacuation of the marina. Please leave immediately. There is no need to panic. Please take your vessel to a safe area outside the marina. If you need assistance, let our staff know via radio transmission on channel XX.”* Security and Marina personnel will strategically position themselves on the docks and piers to assist with directing the boaters out of the marina.
- For boats left in the marina unattended, marina personnel will retrieve the keys and take the boats outside the marina and anchor them in a safe place.
- After the fire has been extinguished, the damage must be assessed and then clean-up procedures will begin.

7.4 Spill Contingency Plan

The proposed development will institute and develop a Spill Contingency and Response Plan with relation to the fuel storage site, standby generator(s), fuel station (limited use) and marina. This plan will basically cover any hydrocarbon spill and/or leak that could occur on the premises and marina. Since each spill is different, it is not practical to develop a spill response procedure that will encompass every situation. Such understanding coupled with training will enable those involved in the response effort to determine the best practical procedures given the various conditions.

7.4.1 Purpose of Plan

The purpose of the plan is to outline the procedures necessary to:

- Increase staff awareness on Spill Response procedures taking into consideration the different governmental tier response levels.
- Define the coordinating mechanisms necessary for staff to utilize their resources in Spill Response Procedures.
- Establish and define clearly the roles and responsibility of Management in Spill Contingency and Response procedures including the marina.

7.4.2 Mechanism

This plan institutes the need for a timely and effective response to spill incidents. In order to respond rapidly and successfully to a spill, personnel responsible for containing and cleaning up the spill must know the steps that need to be followed during and after the spill. Contingency plans describe information and processes for containing and cleaning up a spill that occurs in a defined area of the project. Because the approaches and methods for responding to oil spills are constantly evolving, and each spill provides an opportunity to learn how to better prepare for future incidents, contingency plans are also constantly improving and providing increased protection to human health and the environment from these accidents.

7.4.3 Response Policy

The following tables are DOE Tier levels as described by the National Emergency Preparedness Plan for Oil Spills (NEPPOS)

Table 7.2 Marine Spills Levels

Tier	Quantity (gals)	Location	Response
I	1,000-10,000	Coastal/ Marine	To be managed by polluter
II	10,000-100,000	Coastal/ Marine	Requires government assistance for management
III	>100,000	Coastal/ Marine	Requires Government and/or external assistance

Table 7.3 Inland Spill Level

Level	Quantity (gals)	Location	Response
A	<1,000	On land or Inland	To be managed by polluter
B	>1,000 or poses significant health hazard and requires evacuation	On land or Inland	Responsible party requires GoB assistance to manage the discharge.

For the purpose of this project both Tier I and Level B will be considered.

7.4.4 Fuel Management

As described in Section 3.5.4, fuel management has a very critical safety issue considering the type of development and its location. It is however, not a difficult task to do considering the small to medium volumes, (3,000 to 8,000 gallons) that will be handled by the project. Fuel will be managed to prevent spills and leaks via the following:

- *Storage:* Fuel will be stored inside a reinforced concrete containment wall. This will be designed to contain 110% of the maximum tank volume. To protect against any accidental fire, the tank will be sited away from all electrical installations within the Back of House Area.
- *Documentation:* It is important to keep in mind that the project must order the correct amount or volume of fuel required for operation. For this reason, all the fuel consumed and received must be recorded.
- *Maintenance:* It is necessary to inspect the containment walls, fuel tanks, dispensing pumps, hoses, supply fuel lines and generators for spills and/or leaks. An important issue is fuel lines. The less there are, the better. It is with that reason that the fuel supply lines to the dispensing pumps be of anticorrosive material and fuel tanks must be as close as possible to the generator(s).

7.4.5 Waste Oil Management

It is important however, to reiterate that the project is in a coastal setting. Small waste oil spills for this matter, do fall under the Spill Contingency Plan. Waste oil will be managed according to the following:

- *Storage:* All waste oil will be stored in properly sealed drums and inside a containment wall.
- *Handling:* Used oils are a legal responsibility of the development and thus should be handled adequately and with care.
- *Disposal:* Although the volume may be very small, it is important to properly discard the accumulated waste oil. Once stored, the waste oil should be disposed by an approved or certified DOE contractor.

7.4.6 Contingency Equipment and Safety Priorities

Spill response equipment is the most important component in the Spill Contingency Plan. This equipment can vary depending on the size and type of the activity. For the interest of the development the following equipment will be required:

- Spill Response Kits – these will be installed at key locations such as the marina and depot dispensing pumps, generators, maintenance areas, etc.
- Containment Booms –mostly for marine spills which will be deployed if need be

The Emergency Committee will ensure that the following priorities are taken into consideration:

- Safety to human life is the highest priority in any response,
- Containment of spill to stabilize the situation.
- Minimize and prevent any adverse environmental impact.

7.4.7 Marina Spill Contingency Response Plan

If an oil spill is spotted in the Bellcan Marina, advise the Harbormaster, Marina Office or Security Officer on duty in the Security Booth. Then the following steps must be taken:

1. Locate the source of the spill and shut it off.
 - a. If the spillage is from the marina fuel line or a boat docked in the marina, the main valve line and all secondary valves at the fuel dock must be shut off immediately.
 - b. If the spillage is from a vessel docked at the marina pumping fuel from the bilge, the bilge pump must be disconnected from automatic power.
2. Using booms, the oil spill must be contained in the primary area. All efforts must be made to prevent the spillage from leaving the marina basin and flowing out to other areas of the Channel.
3. The immediate area should be kept clear of vessels during this phase of the oil spill contingency plan. If there are vessels in the area of the spill that may be obstacle to the clean-up process, please have them removed and evacuate the affected area.
4. Post “NO SMOKING” signs in the area and advise marina guests of the incident and request that they stay out of the area to avoid contaminating the air.
5. Assess the quantity of the oil spill.
6. Contact the concerned Government and private entities:
 - a. Department of Environment: Mr. Martin Alegria, Tel: 822-2816
 - b. Bellcan Emergency Committee Chairman Services: XXX-XXXX
7. Begin the clean-up process by removing heavy debris if any and:
 - a. Place in properly secured container using boom and absorption pads.
 - b. Begin subtracting chemicals from the water with on-staff manpower providing the quantity can be handled successfully.
8. All waste products from the clean-up must be transported from the Marina to the fuel containment wall in properly sealed containers for recycling.

9. An incident report must be completed and filed (EMS Format).
10. The Harbormaster is responsible for ensuring that these procedures are adhered to and that the report is completed accurately, distributed to the proper authorities and filed for future reference.

7.5 *Sea Level Rise Contingency Plan*

Sea level rise is a natural phenomenon derived from the process of global warming. Included in this phenomenon is the terminology of climate change and global warming. This process impacts a wide range of naturally occurring processes on earth such as agriculture, and hurricane impacts.

The natural phenomenon of sea level rise is an extremely slow process taking several years to decades to materialize. Nevertheless, sea level rise can primarily impact the project's shoreline. Other such impact can include increased shoreline erosion, high storm surges, flooding, project inundation, changes in the surface water quality and ground water characteristics, increased flood risks and loss of tourism, recreation and transportation functions. Considering its importance from an economic long term investment, the following sections summarize the contingency plan for sea level rise at the project site.

7.5.1 Purpose of the Plan

The overall objective of the proposed project is to mitigate the effects of this long term phenomenon by:

- Preventing erosion and protecting vulnerable areas prone to such activity
- Prepare a comprehensive plan to remediate the problem by formulating tidal charts, sea level maps and the other necessary tools.

7.5.2 Sea Level Rise and Erosion

The purpose of the contingency plan will be limited to sea level rise (tidal rise) which can be a disaster if not monitored. This plan will focus on the project's shoreline and its erosion vulnerability. It's difficult to predict how much the mean sea level will rise and how will it affect the project site.

Considering the new topography of the project site, the project's infrastructure will be built three feet above new levels. This will serve as a buffer for the future. Another mitigation plan involves the use of dredged material for project reclamation.

7.5.3 Adapting to Sea Level Rise

Adaptive responses focus on protection of shores or allowing them to retreat, with subsequent loss of existing shoreline systems and structures. The following points describe the importance of undertaking such a task.

- **Erecting walls to hold back the sea** - Most response strategies to future sea-level rise have concluded that coastal locations will merit protection with bulkheads, dikes, and pumping systems. Bulkheads, seawalls, and rock revetments already are being used to halt erosion and to protect land that is well above sea level.
- **Elevating land surfaces and beaches** - The effects of rising sea level can be offset by elevating beaches, land surfaces, and structures as sea level rises. A key benefit of this approach is that the character of the shore is not altered.
- **Protecting natural shorelines by allowing shores to retreat** - Several planning measures have been proposed to enable some shorelines to remain in roughly their natural state as sea level rises, rather than be replaced with structures. For the most part, these measures apply to areas that are not yet developed.
- **National assessments of adaptive responses** – There has been no documentation on the effects of sea level rise in Belize. Nevertheless, these adaptive responses should be carried out in order to estimate the economies of scale in considering the responses.

7.5.4 Climate Change Effects

According to Usher, (Usher 2000), the changes in the hydrological cycle in Belize as a result of climate change, would be characterized by changes in sea levels, the intensity of hurricanes and its accompanying storm surge, and changes in rainfall patterns and temperature. These changes may result in devastating impacts on the project such as:

- ▶ Exacerbated erosion of the coastline and accompanying beach loss;
- ▶ Alteration or destruction of mangrove and other vegetative communities due to changes in precipitation and seasonality, resulting in the alteration of the productivity of mangrove ecosystems,
- ▶ Increased inundation as a result of sea level rise, with consequences such as salt-water intrusion,
- ▶ Vulnerability to flooding and soil erosion of low lying areas within project site,
- ▶ Loss in net tourism economic activities as a result of the combined effects of climate change,

These issues are of a limited scale to the project site; nevertheless, the net effect of a national scale would be more visible. Planning will include the elevation of property by land filling, the

construction of buildings to standards to withstand major hurricanes, and the following of building codes and guidelines that will minimize damage during disasters.

7.6 Medical Emergency Plan

The proposed Bellcan development plans to implement a medical emergency plan in the event of a medical emergency. A medical emergency is an injury or illness that poses an immediate threat to a person's life or long term health. These emergencies may require assistance from another person, who should ideally be suitably qualified to do so, although some of these emergencies can be dealt with by the victim themselves. Dependent on the severity of the emergency, and the quality of any treatment given, it may require the involvement of multiple levels of care, from a first-aider to an emergency physician through to specialist surgeons.

Any response to an emergency medical situation will depend strongly on the situation, the patient involved and availability of resources to help them. It will also vary depending on the location of the emergency.

This response plan will cater to basic first aid health care only and any emergency transportation to a recognized health institution such as a hospital or health center. This new issue is as a result of the growing tourism industry and the need to offer medical services where necessary. A more comprehensive plan will be developed by the Emergency Committee. In any event, the plan will be required to be approved by a certified doctor, health institution or NEMO.

7.6.1 Purpose of the Plan

The primary objective of the medical response plan is to:

- Establish the coordinating mechanism necessary to respond to a medical emergency and to implement basic first aid treatment where applicable.
- Develop and implement a coordinating mechanism necessary to secure appropriate emergency transportation to a recognized health institution.
- Increase awareness to guests, residents, transient visitors and employees of the availability of such primary health care.

7.6.2 Basic First Aid

As mentioned previously, the proposed development plans to offer basic first aid treatment in the event of a medical emergency. **First Aid** is the provision of limited care for an illness or injury, which is provided, usually by a certified person, to a sick or injured patient until definitive medical treatment can be accessed, or until the illness or injury is dealt with (as not all illnesses or injuries will require a higher level of treatment). It generally consists of series of simple, sometimes life saving, medical techniques, that an individual, either with or without formal medical training, can be trained to perform with minimal equipment.

This equipment usually involves the medical supplies commonly found in a First Aid Kit. A First Aid Kit is a collection of supplies and equipment for use in giving first aid, particularly in a medical emergency. Most First Aid Kits contain bandages for controlling bleeding, personal protective equipment such as gloves and a breathing barrier for performing rescue breathing and CPR (cardiopulmonary resuscitation), and sometimes instructions on how to perform first aid.

Aims

The 3 main aims of first aid, commonly referred to as the “3 Ps” are:

- **Preserve life**
- **Prevent further injury**
- **Promote recovery**

7.6.3 Transportation (Evacuation) of Patient

When conventional first aid requires additional medical attention, the patient must be transported to a recognized health institution for further treatment as quickly as possible. The act of preparing the patient and notifying the institution is a very complicated and critical issue.

Time is of the essence and therefore important in a life or death situation. For this reason it is important for the proposed project to establish relations with the existing governmental and private health institutions of the Corozal and Orange Walk Town area as well as those of Belize City and neighboring Chetumal, Mexico. In any event, the Emergency Coordinator will be required to make transportation arrangements to the health institution in the event of a medical emergency.

Presently the closest health institution is the Corozal Town Community Hospital where professionals are available to provide primary and some secondary health care to the residents. These health care professionals can also be contacted at night or in the advent of an emergency. Similarly, the town has several other health institutions that are also available (See Table 7.4). In the same token critical patients may be required to be transported to the Northern Regional Hospital in Orange Walk Town with subsequent referral to the Karl Heusner Memorial Hospital or any private tertiary care facility in Belize City for immediate emergency treatment. Critically injured patients may also be transported to neighboring Chetumal, Quintana Roo, Mexico either by boat or road. In general, transportation or evacuation of the patient will first involve vehicular transportation to the nearest health institution with referrals to the previously mentioned health centers including those in Chetumal, Quintana Roo,

7.6.4 Contact Information

Contact information is an important factor in considering emergency situations. It can be used in cases of fire, medical and hurricane emergencies. The following table lists the possible contact information for emergencies. This table must be supplemented by the emergency committee listing all the member’s contact information.

Table 7.4 Bellcan Golf Resort & Marina Emergency Services

Institution/Department	Contact Number	Alternate Number
Corozal Community Hospital	422-2076/422-2080	911
Northern Regional Hospital	322-2072/322-1468	
Karl Heusner Memorial Hospital	223-1548	223-5686
Wings of Hope	223-3292	
Fire	422-2105	911
Police	422-2022/422-2303	90/911
Bethesda Medical Center, Czl Town	422-3000	
Northern Medical Plaza	322-2320	
Clinica Carranza, Chetumal, Mexico	052-983-835-1440	

7.7. Environmental Safety and Health

Environmental safety is a growing concept that must be developed, especially considering the growing number of tourists who visit the country. Moreover, this concept must be practiced on a daily basis by those who make up the tourism industry. Risks and hazards abound in our society, thus the proposed development is no exception.

The Emergency Committee of the proposed development will develop a training and development program for the project. This program will cover basic areas designed to minimize and prevent injury and illness where possible. This program will not be required to divulge in general or in detail the many risks and hazards that exist or affect the project. Nevertheless, it's important to address these concerns, especially considering the location of the project.

Training in the field concerned with workplace learning to improve performance. Such training can be generally categorized as *on-the-job* or *off-the-job*. On-the-job describes training that is given in a normal working situation, using the actual tools, equipment, documents or materials that they will use when fully trained. On-the-job training is usually most effective for vocational work. Off-the-job training takes place away from normal work situation which means that the employee is not regarded as productive worker when training is taking place. An advantage of off-the-job training is that it allows people to get away from work and totally concentrate on the training being given. This is most effective for training concepts and ideas.

(a) Hurricane Preparedness Plan

Hurricanes and storms can cause severe property damage and flooding, especially considering the project environment. Moreover, the restoration time is virtually unknown with these types of sustained damages. With this in mind, the Emergency Committee will carry out yearly training in the form of drills to fine-tune and sort out the preparation process. These drills are important in accessing the integrity and functionality of the preparedness plan.

(b) Fire Prevention and Response Plan

Fire outbreaks are dangerous if not contained and extinguished in time. Time is of the essence when dealing with fires. The Emergency Committee of the development will ensure that the persons assigned to fight a fire are properly trained. Training can be carried out by the National Fire Service upon request. The trainee will basically get an understanding of the concepts of a fire and how to properly operate and use a fire extinguisher to fight small fires.

The training will be enhanced to include the usage of the project's fire hydrant system to extinguish large fires that might occur. Special attention will be paid to this section as it signifies the last line of defense for the proposed project. The fire hydrant lines (loops) will be buried underground for aesthetic purposes. The training will also include the maintenance of both the fire extinguishers and fire hydrant systems.

(c) Spill Contingency Plan

Training in this field will be limited to small localized spills that could occur on the project site and any marine spills. Precedence will be given to the small spills since the probability is much higher. Needless to say, marine spills will be of concern, but these can be more aptly addressed by mitigation measures. Trainees in this area will be required to learn the basics in spill containment and remediation process. This will involve the deployment of spill kits to the required areas and also undertaking remediation services. Training in this field can be undertaken by the Department of the Environment, or private consultancies.

(d) Sea Level Rise Contingency Plan

There is no specific training in this field nevertheless; a monitoring program must be developed of some sort to monitor the erosion of the coastal areas of the project site as well as the marina areas, deposition of sediments, water quality and flooding where necessary.

(e) Medical Emergency

Much of first aid is common sense, and people are almost certain to learn some elements as they go through their life (such as knowing how to apply an adhesive bandage to a small cut on a finger)

However, effective life-saving first aid requires hands-on training by experts, especially where it relates to potentially fatal illnesses and injuries, such as those that require Cardiopulmonary Resuscitation (CPR), as the procedures may be invasive, and carry a risk of further injury to the patient - which the '3 aims' of first aid above, clearly try to avoid.

To be adequately trained, a person must attend a course (hopefully leading to a qualification or certificate) provided by the Red Cross on First Aid and CPR. CPR can be broken down into three (3) sectors, Adult, Child and Infant CPR. Due to regular changes in procedures and protocols, based on updated clinical knowledge, the First Aid and CPR Certification is only valid for 2 (two) years, therefore, re-certification must be sought in order to ensure best patient

practice and care (and to minimize the chance of being held liable for further injury or deterioration).

Training in first aid is often available through the Red Cross or through commercial providers, who will train the staff for a fee. This commercial training is most common for training of employees to perform first aid in their workplace.

(f) Others

There is other training that is required by the proposed development. Most of these include on the job training such as landscaping, life guard, fuel dispatcher, etc. In the tourism field, there are many such instances that require some sort of qualification and training. Nevertheless, the proposed development plans to implement training exercises into the operation of the project.

7.8 Conclusion

In obtaining quick and decisive responses, the Emergency Committee of the proposed project should have regular meetings, training and drills to update their continued effort in disaster preparedness and management. It is in fact a coherent relationship between management and employees to display sound actions in the case of a disaster. This relationship extends far beyond the property boundary lines as members also take this experience home. A quick and well-planned response is always an essential tool in dealing with any natural or man-made disasters.

It is also important to maintain constant communication with the relevant authorities in an effort to streamline the response mechanism. It is also essential that the residents of the project be in constant communication with the Emergency Committee and vice versa, especially when it comes to fire, health and natural disasters. Overall, it is important to conduct regular training exercises for those employed to protect the well being of the residents of the anticipated development.