

Terms of Reference
for the Creation of a Safe Swim Area
and an Inflatable Waterpark
at Brandon's Beach, St. Michael, Barbados

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Terms of Reference for the Creation of a Safe Swim Area and an Inflatable Waterpark at Brandon's Beach, St. Michael, Barbados

1. Description of the Waterpark Feature

Rationale for the Waterpark:

Brandons Beach has historically been a location which is popular with local pleasure seeking sea bathers as well as health conscious individuals. It is also a heavily used beach for other sporting purposes such as beach volleyball, cricket and football, many of whom jump into the sea to cool off after a good game. However, the beach does not have a properly buoyed, safe swim area along any length of the beach, although there is a National Conservation Commission (NCC) Lifeguard Tower Station located at the north end of the beach.

With the development of a safe swim area and an inflatable water park (the Waterpark) at this southern location, where many locals traditionally go to bathe, it is the goal of Rascals of the Caribbean to link the development of a fun, active Waterpark and safe swim area with the development of the neighbouring communities and beyond. The area where the Waterpark would sit offshore is not in the way of any beach volleyball, cricket or other beach games presently being played on the beach – these activities usually happen directly in front of the Rascals restaurant compound.

An increase in the numbers of beach users due to the introduction of a Waterpark to the nearshore waters of Brandons Beach will *de facto* increase the number of people using the NCC beach facilities – the bathrooms and changing rooms. In the early stages of the Waterpark being open, this may become an issue; however, there is a Phase II construction plan that would increase the existing facilities to better manage the influx of more visitors to the beach.

Additionally, with the proximity of Brandons Beach to the Bridgetown Cruise Terminal, it is a close and safe venue for cruise ship passengers to enjoy some beach and sea time. This is a newer type of marine fun, so the potential for this Waterpark to become the #1 Waterpark in the Caribbean is very real and timely.

Location of the Development:

The Waterpark will be located off the sandy shores of Brandons Beach (Figure 1). This development would be a non-motorized marine attraction, which is of interest to both locals and visitors to the island. With this in mind, we are proposing the development of a safe swim area and a water park. The area of beach directly in front of the proposed site for the Waterpark is where the storm drain debouches into the sea, so is not used for any beach sports.

The safe swim area boundaries will be located at designated spots, using specific latitude and longitude coordinates for each anchor point for the boundary buoy lines, giving it an approximate area of 20,482m. It covers sandy areas and some coral rock reef habitat which is presently in very poor condition.

The Waterpark itself will cover an area of 53.5m x 51.5m within the safe swim area, and will be installed in 2.5 – 4.5 metres depth of water.

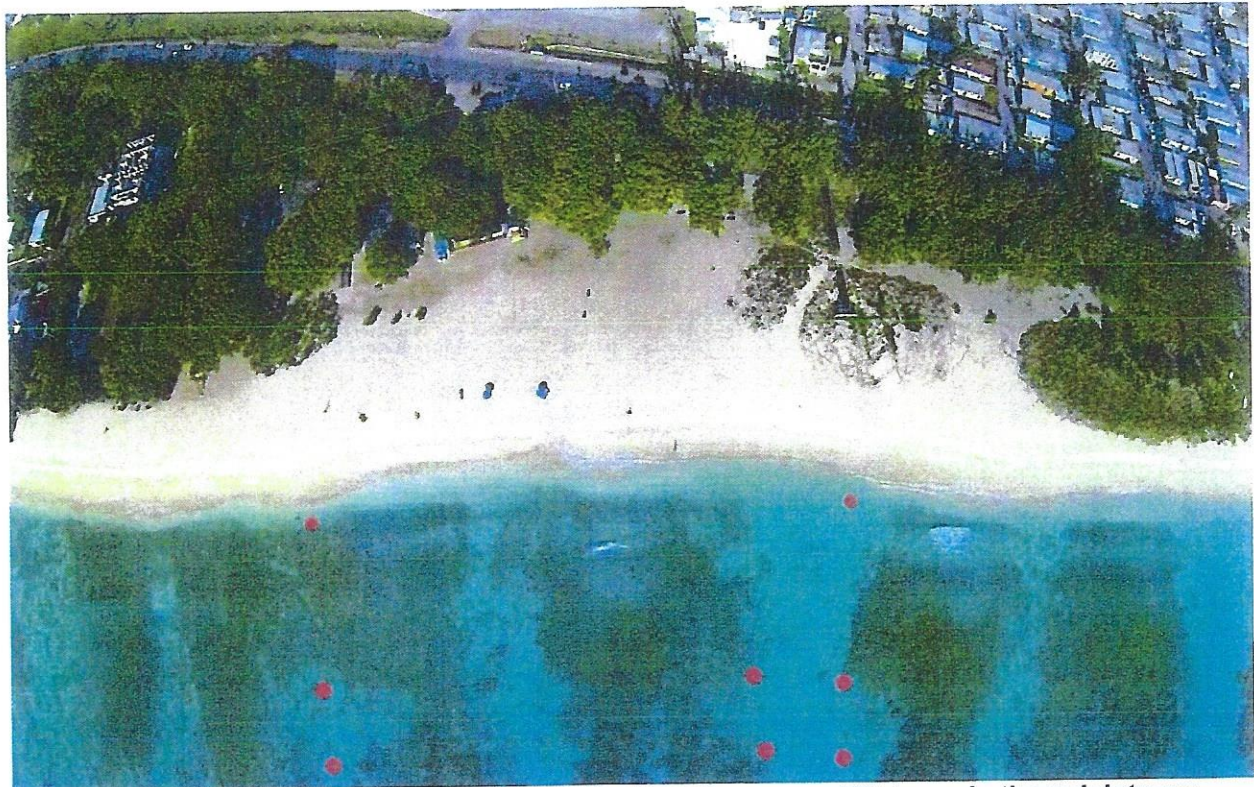


Figure 1: The general location of the proposed safe swim area and Waterpark; the red dots are sites for the main anchors of the proposed Waterpark and the safe swim area.

Physical Characteristics of the Waterpark:

The Waterpark is a three-dimensional structure, allowing approximately 140 people to play in the Waterpark at one time. It is made up of many linking pieces, allowing for different types of activities within the feature. These include slides that have to be climbed from one side in order to slide down the other side, trampolines, ladders, swings, rest areas, crawl-through tubes and teeter-totters.

Land-Use Requirements of the Waterpark:

There is one construction phase to the land-use requirements of the Waterpark and its surrounding safe swim area, which we refer to as Phase I.

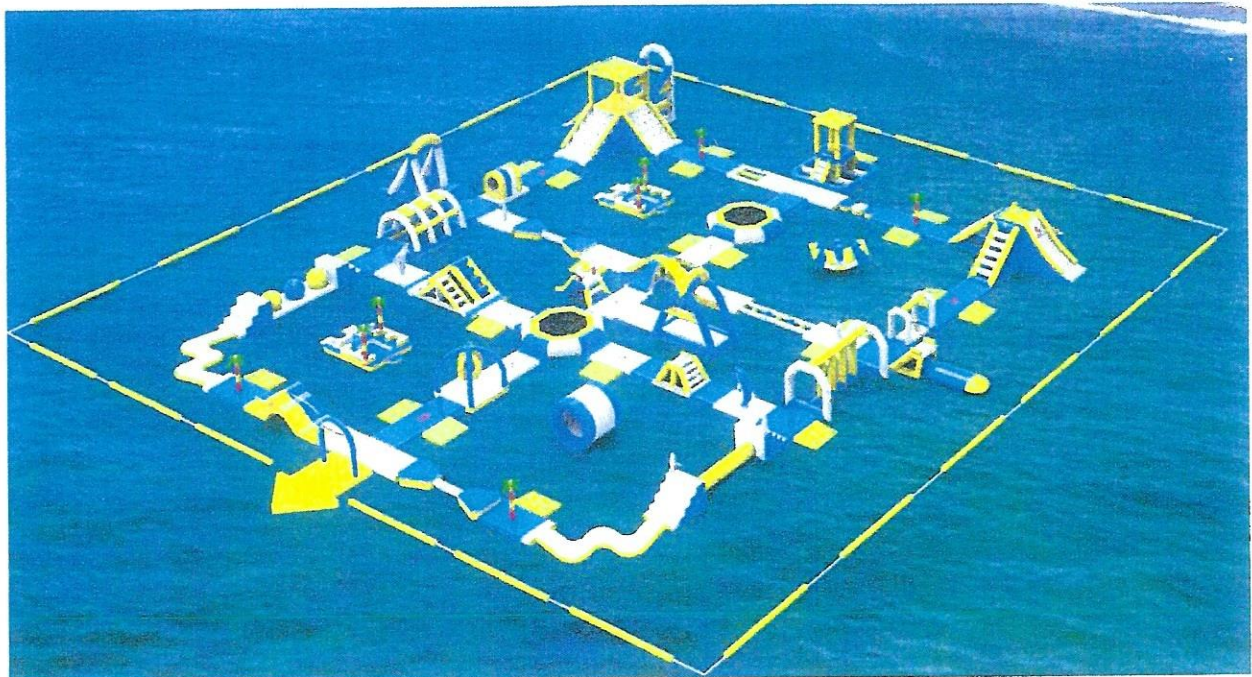


Figure 2: the basic concept of how the Waterpark may be set up – individual pieces may change

Construction for Phase I

i) Several days before installation of the inflated Waterpark feature, the one tonne cement anchors will be placed in the appropriately designated spots, using specific latitude and longitude coordinates for each anchor. These large anchors will be linked together with chain, as designated in the installation manuals provided with the system. This will take two to five days, depending on sea conditions.

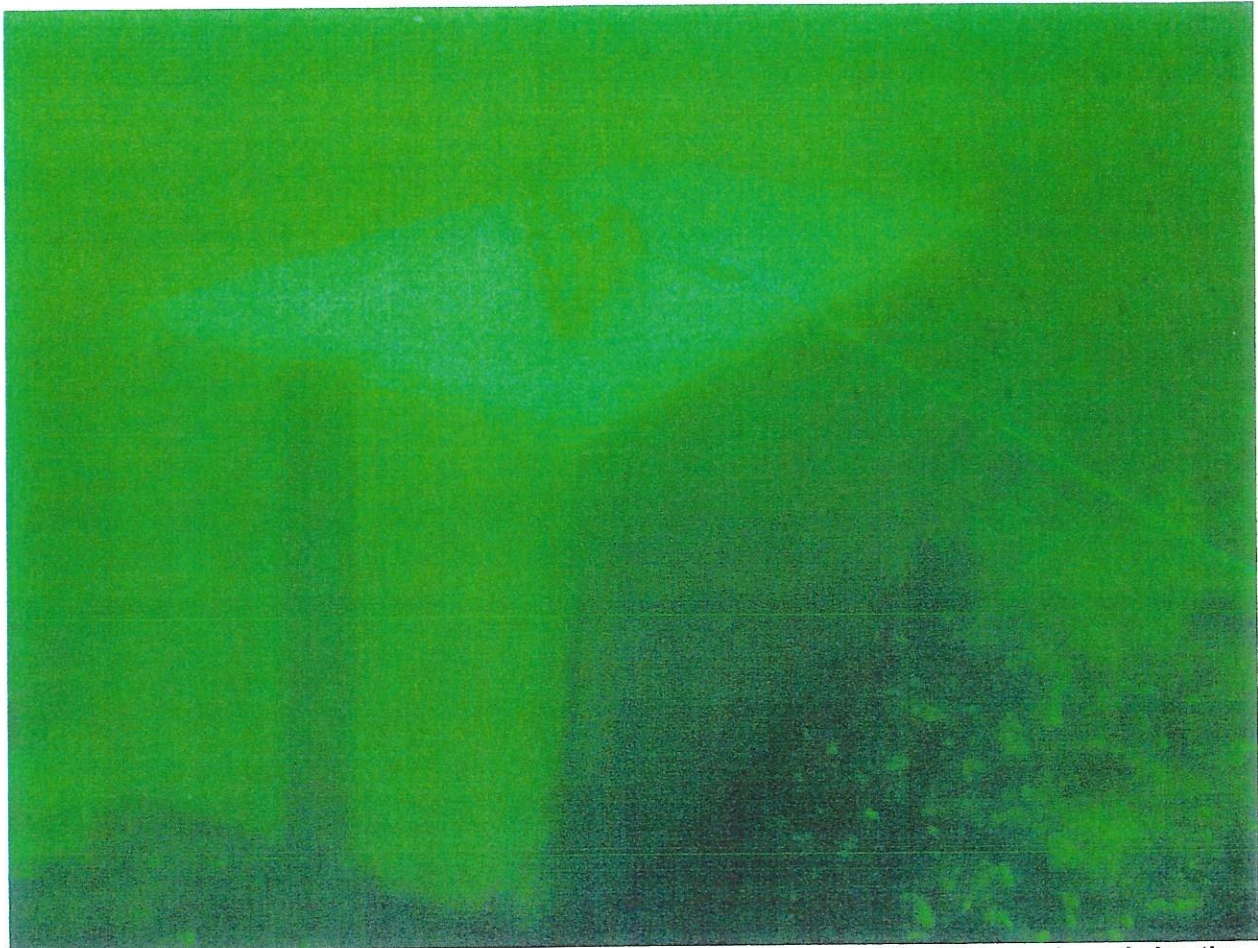


Figure 3: The one tonne cement blocks that will anchor the corners of the Waterpark, and also the outer corners of the safe swim area.

ii) Once the large, main anchors are correctly placed, the safe swim area buoyed lines and anchors will be placed out in their designated positions. This will provide a safe boundary for divers and labourers while installation is going on. This will take two to three days.

iii) It will take approximately 8 people to erect the Waterpark and place it in position on site: five land labourers and three SCUBA divers. This will take one day.

iv) Inflation of the Waterpark pieces, along with connection, erection and placement of all the pieces will take place in one day. The sections of the water park will be arranged on land on the beach in front of its marine location, in order to be sure all the pieces fit together properly, once correctly inflated.

v) Protection of the product is important in order to avoid scratches or piercings during transportation and inflation on the beach. A large plastic sheet will be placed under each Waterpark piece as it is being inflated, in order to protect from sharp coral rock or glass debris. Once assured that all the pieces fit, they will be floated out to the Waterpark site

in manageable pieces, and attached to the anchors that were earlier set into place on the sandy seafloor in the proposed site for the Waterpark.

vi) The sand bag weights will be filled with sand from within the safe swim area, and will then be attached to the underside of specific sections of the Waterpark, as instructed by the manuals, adding to the stability and safety of the Waterpark.

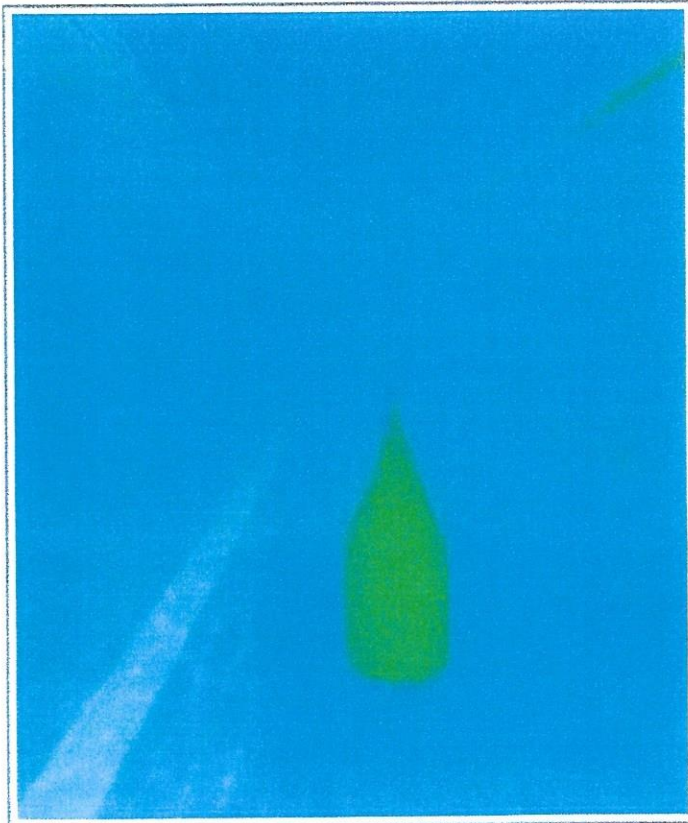


Figure 4: One of the attached sand bags, which add support to the floating structure.

vii) Boundary buoys attached together by floating line will then be strung along the three sea edges of the Waterpark and Swim Area, providing the safe swim boundary around the Waterpark feature.

Waterpark Materials, Care and Safety:

Commercial waterpark features are meant to be rugged and tough, and able to handle being heavily used. No parts should be able to be easily damaged by regular human use.

The Waterpark is built of the highest quality plastics, the kind most durable in tropical marine environments. Each component of the Waterpark is stitched with a 5 layer seam system and super strong UV protected PVC sheeting (1.100g/m^2) / (32 oz/yd^2) in order to ensure durability. It uses only 316 stainless steel metal parts and springs.

Pressure is monitored every hour, and more frequently between 1100-1400 hours, when temperatures can rise quickly, to ensure the inside pressure is safe, especially for big items like the tower, big slide etc. Every piece has a safety valve, but for the large pieces, the air may not come out in time.

The Waterpark will allow approximately 140 people to play in and on the Waterpark at any one time.

The Waterpark will employ safety officers/lifeguards out on the feature itself in order to ensure safety of the users. Rascals intends to hire approximately 60 persons on a full time basis and another 20 on a part time basis at the Brandons location. It is hoped that young men and women from neighbouring communities will be trained in food and beverage operations, sales and customer service, lifeguarding and water safety techniques, marine conservation and numerous additional disciplines as are necessary for the smooth running of the operation.

The park will be closed with the threat of a tropical depression, storm, and during large swell events, and may even be dismantled for extreme weather events. Please refer to Section 6 (Mitigation Management Plans) for the heavy weather management plan.

Expected Residues:

There is one residue that should be given some consideration. Scientific research has now proven that sunscreens with oxybenzone and/or octinate in them are harmful to coral reefs. We are conscious that people will be using sunscreen in the Waterpark just as they do while sea bathing. We will encourage the use of non-toxic sunscreens.

Expected Emissions:

There should be no expected emissions of any sort, coming from the Waterpark.

i) Water – the marine water quality should not be impacted by the physical placement of the anchors, and the connection of the Waterpark feature to those anchors. The size of the anchors precludes them from being moved by anything less than a hurricane.

ii) Air – there will no impacts on the air quality in the area from the waterpark.

iii) Sand Pollution – An increase in litter along the beach may become a problem if extra trash bins are not made available for increased beachgoers and Waterpark users. The sand patches within the Waterpark boundaries should not be detrimentally affected by the Waterpark being sited there; in fact they are the reason that the site was chosen.

iv) Noise Pollution – There should be no noise pollution impacts from the waterpark, just the sound of people having fun!

v) Vibration, Light, Heat & Radiation – There should be no impacts from vibration, light heat or radiation.

2. Alternative Commercial Water Parks

Several different commercial water parks were first looked at, before looking more closely at two brands: **Wibit** and **Bouncia**, with the latter the number one choice at this time. Both companies build water park features for the marine environment. Size, shape, cost and durability were all taken into account when choosing the brand that would work best for the environmental conditions that are available at the Brandons Beach location site: shallow water with a mostly sandy bottom, with easy and safe access to the Waterpark within a safe swim area.

3. Physical, Biological and Social Environmental Impacts

i) Impacts on Human Beings:

Because the Waterpark is based in the sea, there should be no deleterious effects on beach bathing or walking, once the Waterpark has been installed. It will take one day to put the park together and anchor it at sea, so there will be that one day that the beach goers may be disrupted from their usual activities. This would also be the case for when the water park is deconstructed at least once a season for maintenance.

Once the Waterpark is *in situ* and the swim area cordoned off with buoys and floating line, beach bathers swimming within the safe swim area will be better protected from any marine traffic than before.

The Waterpark should provide a positive social impact amongst the neighbouring communities, who are in place to take advantage of the many employment opportunities coming from the introduction of the Waterpark to the area.

ii) Biological Impacts:

As mentioned earlier, there are not many records of protected sea turtles nesting on this southern section of Brandons Beach; they tend to nest further north along the beach by the Power Plant cooling water outfall (about one kilometer up the beach).

Nesting turtles are mostly hawksbills, with also the odd leatherback showing up. Green sea turtles are also known to forage or graze on the seafloor within the vicinity of Pile Bay (about 1.5 km the Waterpark site); mostly on scraps thrown by the fishers into the sea after they have cleaned their daily catch.

There should be no conflict of interest between turtles and the Waterpark while it is being inflated on land (turtle nests) and whilst it is anchored on site (free movement of turtles going to and returning from nesting on beaches, or foraging in the area).

iii) Impacts on the Physical Environment:

There should be no damage done to the beach environment whilst inflating and connecting pieces of the Waterpark feature together. They will be resting on the beach for the shortest time possible as they are meant to be floating in the water and not sitting on the hard ground or even on the beach sand.

As there will be great care in placing the anchors on the sea floor, there should be no physical impacts directly on the marine environment from the placement of the Waterpark in this site. Please refer to Section 6 (Mitigation Management Plans) for the heavy weather management plan.

iv) Dust Impacts:

There will be no dust quality impacts from the Waterpark, as it is based in the sea.

v) Air Impacts:

There will be no air quality impacts from the Waterpark – the anchors will be placed on the seafloor in a controlled manner and at the correct location from a boat in the sea.

vi) Noise and Vibration on Humans and Fauna:

There should be no noise and vibration impacts on humans from the Waterpark, as it will be located offshore of Brandons Beach. The wind blows offshore for most of the year in this location, which should carry any strong sounds of fun away from disturbing the tranquility of the beach.

There are no CITES beach based plants located on the section of beach that would be used for inflation and connection of the Waterpark pieces to each other before being deployed into the sea for final connections to the anchors.

There are some migratory shorebird species that feed along the beach strand, but they will not be affected by this phase of the construction as they are constantly moving along the shoreline looking for food, and can easily fly around that section of beach and shoreline during the day of construction of the Waterpark.

vii) Changes in Availability of Infrastructure and Utilities:

Roads and bridges: there will be no impact on roads and bridges, as the Waterpark is located in the marine environment (the sea).

Electricity: there will no impact/increase on the electrical needs of the Waterpark, as it will be closed before dusk each night.

Water: An increase in the numbers of beach users due to the introduction of a Waterpark to the nearshore waters of Brandons Beach will *de facto* increase the number of people using the NCC beach facilities – the bathrooms and changing rooms. In the early stages of the Waterpark being open, this may become an issue; however, there is a Phase II construction plan that would increase the existing facilities to better manage the influx of more visitors to the beach.

Services: With any increase in the number of visitors to Brandons Beach and the Waterpark, the NCC may have to increase their maintenance of the beach and the beach facilities.

Waste Disposal: Waste disposal services may need to be increased and/or more garbage bins placed in the high-use beach areas if there is a large increase in the number of beach users to Brandons Beach and the Waterpark, as solid waste garbage may become an issue.

viii) Traffic:

There should be no impediment to traffic flows, as the park is located off the beach in the marine environment (the sea). Visitors to the Waterpark have ample parking - both at the Brandons Beach carpark and also in the carpark located directly across the street from the site of the proposed Waterpark. The beach carpark can hold approximately 40 vehicles, and the carpark across the street can hold about 150 vehicles. The latter car park is, at present, rarely used, indicating that it should easily take up any of the excess vehicular traffic that the Waterpark may create.

An important note is that many of the potential patrons to the Waterpark will be visitors coming via bus from the Cruise Ship Terminal and from hotels, where they will be dropped off and picked up on a schedule created by the tour operators. The bus operators would prefer to drop the visitors to the Waterpark at the large carpark across the street, and pick them up from the same place, thus reducing any clogging of the smaller car park on the beach beside the Rascals compound and the NCC facilities. There is a safe, lighted, pedestrian crossing across Spring Garden Highway at this site, making it feasible for the carpark to be used for this purpose. Other patrons coming from the cruise ships may decide to walk to Brandons Beach from the Cruise Ship Terminal, as has been witnessed in the past; others may use taxis.



Figure 5: Google image of the two carparks available for Brandons Beach and Waterpark users

4. Significant Effects of the Development on the Environment

Beach and Marine Environment:

There should be no significant effects on the beach environment, as the Waterpark is based off shore of the beach. There is no suggestion that there will be any short, medium or long-term effects on land from the erection of a Waterpark in the sea off of Brandons Beach.

The Waterpark will be deployed into the sea and then anchored on site; there should be no permanent negative marine effects from this or from the Waterpark staying *in situ* on its anchors during the majority of the weather that Brandons Beach receives.

Direct Effects of the Waterpark:

There may be some disturbance of the beach area directly in front of the proposed Waterpark site during assembly of the park pieces, but there are no nesting sea turtles presently using that section of the beach, so they should not be directly impacted.

Some beach bathers and walkers may have to change their beach position in order to allow space for the safe inflation and erection of the Waterpark pieces. The installation area will be cordoned off in order to keep beach goers safe. As installation should only take one day, it is hoped that people will not be affected for very long.

Indirect Effects of the Waterpark:

i) Land Environment: There are no envisaged negative impacts of the Waterpark on the land environment.

ii) Marine Environment: There should be no significant effects on the marine environment. The anchors and sand bags for the waterpark will be located on sand. Manta ray anchors will be used if any safe swim area buoy lines need to be anchored to the reef rock – no live coral will be disturbed or damaged. There are very few, if any, invertebrates that will be affected by placing the anchors on the sea floor. Just prior to the anchors being placed, two divers will check the locations for any marine animals that need to be moved from the area for their safety.

A marine monitoring plan will be put into place in order to ensure that there are no negative, long term affects from having the Waterpark situated off Brandons Beach.

5. Amelioration of Adverse Effects on the Environment

There is not to be any expected adverse effects on either the marine environment, nor on the beach environment, from the erection of an inflatable Waterpark in the nearshore waters off of Brandons Beach. However, there are steps included in the Mitigation Management Plan to ensure ensure there is no damage to the beach and marine environments from the installation and running of the Waterpark.

6. Mitigation Management Plans

Site Preparation & Construction Plan

Environment	Mitigation Strategy
<p>Brandons Beach (Laying out the Waterpark on the beach, inflating and connecting it before launching it in the sea)</p>	<ul style="list-style-type: none"> • Be sure beach is raked clean and clear of debris before unloading the Waterpark pieces • Lay large plastic sheets on the raked beach; the Waterpark pieces will be laying on these while being inflated • Remove the plastic sheets as soon as possible from the beach, once all pieces are inflated and moved offshore to the Waterpark site • Rake the beach loose again after any compaction from the Waterpark pieces or from humans moving densely in the area
<p>Brandons Beach Nearshore Waters (The site of the Waterpark)</p>	<ul style="list-style-type: none"> • Set the large anchors in place for the Waterpark • Set the anchors in place for the buoyed safe swim area • Attach the floating line and buoys demarcating the safe swim area, so that workers and divers are in a safe zone while connecting the park features together • Float the linked and single pieces of the Waterpark through the safe swim area to the anchor site for the Waterpark, using lines to control its speed (important if wind is high) • Attach the connected pieces to the large anchors • Attach the stabilizing sandbags to the bottom of the selected Waterpark feature pieces

Daily Site Operation Plan

Environment	Mitigation Strategy
<p>Brandons Beach</p>	<ul style="list-style-type: none"> • Be sure beach is raked clean and clear of debris every morning before people walk the beach to the Waterpark entrance area • Ensure that there is a safe, manageable way to get people from a demarcated spot on the beach out to the Waterpark and back in to the beach, at designated times
<p>Rascals Waterpark</p>	<ul style="list-style-type: none"> • Daily check all anchor lines and chains attaching the Waterpark to the anchors; ensure no chafing or wear and tear on the lines prior to opening to

	<p>the public</p> <ul style="list-style-type: none"> • Have the designated number of lifeguards on duty for the number of people using the Waterpark at any one time • Close the Waterpark at the designated times, ensuring that all users are accounted for as they leave the Waterpark, and accounted for again once back on the beach
Waterpark Protection	<ul style="list-style-type: none"> • The Waterpark will be closely monitored during the day by the staff operating and managing the Waterpark. • During the hours it will not be in use, there will be a 24 hour security guard on the beach. The security guard will have access to a high-beamed flashlight, which will be able to light up the Waterpark from the shore. • If any people try to use the Waterpark illegally, the RBPF will be called in to apprehend the individuals. • Motion sensor lights will be attached to the Waterpark apparatus, lighting up the structure if there are abnormal movements on the Waterpark at night.
Off Season Storage	<ul style="list-style-type: none"> • After the season, each of the connecting parts of the Waterpark will be brought ashore. Each piece will be fresh water rinsed, cleaned and dried before being packed into designated storage bags. All the components will be stored in their bags in an area of the Rascals compound protected from the elements.

Heavy Weather Management Plan

Environment	Mitigation Strategy
Rascals Waterpark	<ul style="list-style-type: none"> • Daily weather checks (morning and evening) to ensure that it is safe for Waterpark operations and also allowing for enough warning time to organize for severe weather. Hurricane/heavy weather information is issued by the Department of Emergency Management (DEM), and Waterpark staff will be checking daily for weather bulletins. • When heavy weather (tropical storm/hurricane and/or heavy swells) are predicted to affect the Waterpark's physical safety and the safety of the

	<p>environment, the Waterpark will allow enough time prior to any storm event to dismantle the Waterpark.</p> <ul style="list-style-type: none"> • The security lighting will be disconnected from the Waterpark and stored in safe, dry site on the Rascals compound. • The one tonne anchors will remain in place on the seafloor. • The sand bags will be removed, cleared of sand, and brought ashore for safe storage during any event that would see the Waterpark itself dismantled. • The Waterpark will be dismantled and brought ashore for safekeeping. • Each piece of the Waterpark will be cleaned and dried before being packed in designated storage bags. • The components will then be safely stored away from the elements in a (locked) area of the Rascals compound.
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Emergency Management Plan

It is of grave importance that the patrons of the Waterpark are managed in a safe and secure manner whilst moving to and from the Waterpark attraction, as well as whilst playing in the Waterpark proper. To that end, an emergency management protocol has been created to ensure that the Waterpark, its personnel, the public and the environment are protected within the context of disaster risk management.

This plan is intended to cover the Waterpark during everyday use in good weather. There is a separate 'Heavy Weather Management Plan' for the Waterpark structure itself, as most severe weather can be predicted far enough in advance to allow the Waterpark staff to close the structure days in advance if need be, in order to prepare for the heavy weather.

Emergency Management Protocol

1. Provision for Well-trained Lifeguards and Attendants

The National Conservation Commission (NCC) of Barbados is in charge of the maintenance of the beaches through its grounds crew staff, and of the safety of the swimmers through its lifeguard staff. NCC lifeguards have been trained to a high standard, using the Canadian Lifeguard Association's training methods and tools.

Although there is an NCC lifeguard hut located on the beach, it is realistically too far away to be of effective use for Waterpark patrons. And as the Waterpark is a private venture, the Waterpark must employ properly trained staff to attend to the safety and welfare of their own patrons, and not expect the NCC lifeguards to be held accountable for the welfare of Waterpark patrons. However, if an NCC lifeguard is aware there is an emergency on the Waterpark, and it does not endanger the safety of other swimmers in the vicinity, one would expect the NCC lifeguard to come to the scene for backup aid.

If at all possible, the Waterpark would like to employ part-time/past NCC lifeguards to be a part of the Rascals team on the Waterpark, and to also help train the rest of the Waterpark attendants and staff in water safety. Ideally, the Waterpark staff will be trained and tested at the highest levels available here on the island, in order to ensure the highest levels of safety for all Waterpark patrons and staff alike.

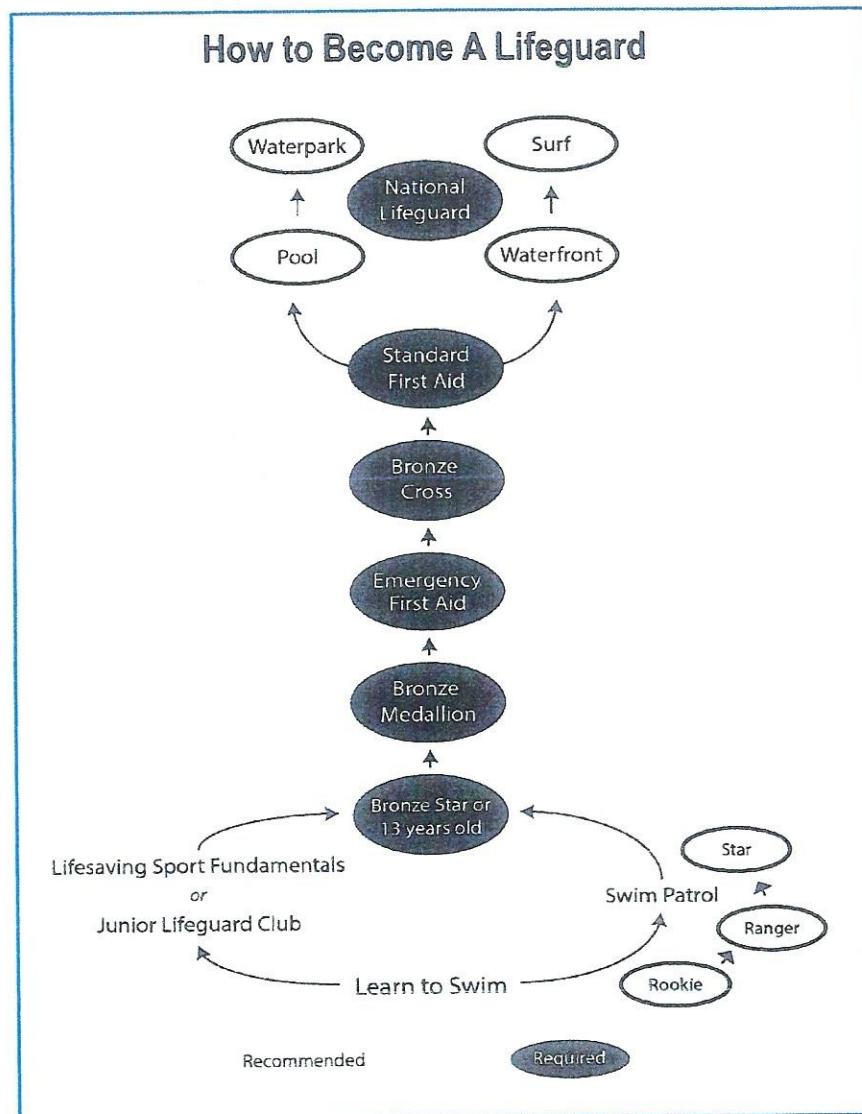


Figure 6: Flow chart showing the steps taken to train to become a Canadian lifeguard.

2. Evacuation Procedures for Patrons on the Waterpark Structure during an Emergency

There are two types of emergencies that may arise on the Waterpark structure: sudden dangerous weather occurrences, or a physical injury to one or more of the patrons.

In the event of any type of emergency taking place on the Waterpark itself, a (trained) lifeguard's whistle continually blowing will alert all patrons to stop playing on/in the Waterpark, to come out of the water, and to pay attention to the senior lifeguard's instructions regarding what to do next. All the lifeguards and Waterpark staff on duty will focus on assisting the patrons in following the senior lifeguard's instructions.

Patrons will never be left unattended on the Waterpark.

i) Inclement Weather Emergency:

If the emergency is due to sudden inclement weather (such as sudden heavy rain or a thunderstorm), the Waterpark will be evacuated in a calm manner, with all patrons asked to leave the Waterpark, being accounted for as they leave the structure. They will assemble within the Rascals compound, safely away from any potential harm due to the weather.

If the inclement weather passes over quickly – within an hour, then the Waterpark patrons can return to the Waterpark, and continue to enjoy their time. If the weather continues on or deteriorates, then the Waterpark will close for the remainder of the day, and patrons can return once the weather has improved.

ii) Physical Injury Emergency:

If the emergency is due to a physical injury to one or more of the Waterpark patrons, the Waterpark activities will be immediately stopped; all patrons will be removed from the water (and remain accounted for on the Waterpark structure) while the injured person(s) are attended to.

There is at least one lifeguard safety station (with First Aid kit) on board the Waterpark, where basic first aid needs can be met. However, for any severe injuries and/or near drowning events, the injured patron will be immediately brought to safety on board the Waterpark and assessed and treated (if possible) for injuries. Basic first aid will be applied if there is time before the injured person(s) is moved onshore to the Rascals compound, where more first aid can be taken with any injuries. If the injury is immediately obvious to be severe, Rascals senior staff will be told by Waterpark staff (communication via in-house walkie-talkie systems), and an ambulance will be immediately called to the scene in order to ensure the quickest response time for the injured patient.

3. Mitigation Measures in the Event of a Natural Disaster

i) The Waterpark: Please refer to the Heavy Weather Management Plan above.

ii) The Waterpark Personnel: All personnel will be well aware of any inclement or heavy weather that may lead to a potential natural disaster, and will have been asked to stay in the safety of their homes until it is safe to come back to work.

iii) Patrons of the Waterpark: Patrons will know in advance that the Waterpark will be closed during inclement or heavy weather that may lead to a natural disaster. They should not be a concern of the Waterpark owners once the Waterpark has been officially closed and broken down for safe storage during any heavy weather that may lead to a natural disaster.

iii) The Environment: The only items remaining in the sea during a potential natural disaster scenario are the one tonne cement anchors and possibly the sand bag weights. The anchors should not easily move in severe weather conditions due to their size and weight. The sand bags will be removed, cleared of sand, and brought ashore for safe storage during any event that would see the Waterpark itself dismantled.

7. Impacts and Issues to be Studied and Included in the EIA

i) Marine survey of the benthic communities in the nearshore marine area that may be impacted by the placement of the Waterpark in the sea.

ii) Brandons Beach Waterpark and Safe Swim Area Survey (for local users of the beach and those living in nearby communities). It covers sea bathing habits, safety in the water and if there is an interest in having a Waterpark off the beach at this site.

iii) Marine monitoring plan to confirm and ensure that the Waterpark does not negatively impact the environment over time once it has been approved and opened for business.

8. Technical Difficulties Compiling the TOR

There have been no difficulties in compiling the information for this application.