SECTION FOUR

DEVELOPMENT ALTERNATIVES

4.1 Introduction

Belize, like most of the developing countries is undergoing dramatic changes which are transforming it socially and economically. The government is under pressure to improve the standard of living of the people, especially in these hard times. To this end tourism development has been earmarked as one of the promising avenues to growth, even though our present visitation figures have been decreasing. Nevertheless, tourism is still considered a vibrant industry and therefore the relevant issue is how to steer this growth in a sustainable direction so that it will do the most good for all the national stakeholders. The question then becomes whether the approach to the project is sustainable socially, economically and environmentally and if not how could it fulfill these higher principles.

In considering the overall project concept and its potential environmental impacts, there are usually two or more important developmental alternatives for each proposed activity to think about. The alternatives may encompass a wide range of consideration and can represent a choice between the different developmental activities for the proposed project.

4.2 The 'No Action Alternative'

In the analysis of the development alternatives, the option with the highest cost benefit, the most technical feasible and with the least residual impact is usually identified as the preferred option. Of course, these options should also consider the environmental, technical and economic grounds of the chosen alternative.

Therefore, the "No-action" alternative or non development option is usually discussed as an option in the EIA process. However, this alternative is difficult to consider as a viable option due to the pre-existing investments which have been incurred by the developers. One of the most costly investments that are normally incurred prior to project approval is land purchase.

The initial investments already incurred were the primary reason for the no action alternative not to be found economically feasible. This option would result in the loss of investment capital, and the loss of economic opportunities such as employment generation, revenue and foreign exchange generation etc. However, the EIA as a planning tool is considered critical for the determination of potential negative impacts, mitigation measures and as an important part of the process of identification of best technology for the project.

However, beneficial results of non-development options cannot be ignored. These benefits include ecological and environmental preservation, and the reduction of stress to existing flora and faunal assemblages. One of the primary habitats that continue to be degraded and lose its ecological characteristics is the mangrove forests, which is an important vegetation type of the

coastal plains of Belize. Mitigation measures addressed elsewhere, call for the clearing of this vegetation by selectively identifying important plants within the zone of impact and ensuring their preservation.

4.3 Technical and Economic Analysis

For a project to be viable it must ensure that the development is technically, economically and financially feasible. These three variables, from a financial standpoint, are usually reflected in a Cost Benefit Analysis (CBA) that compares the economic feasibility of all options. CBA is concerned with an analysis of cost and benefits for the economy as a whole. The objective is to know the difference between social benefits and social costs.

During the analysis, financiers also looked at the need to develop the site using the most practical technology bearing in mind the objective of maintaining as much as possible, the ecological integrity of the area and the habitats it supports.

Technical and economic feasibility is then weighted against environmental /ecological degradation to determine its viability. Consideration of technical and economic analysis included consideration for population density, suitability of site, accessibility, and protection against natural disasters, construction costs, recreational benefits, job creation and revenue generation.

4.4 Conceptual Strategy for Alternative Analysis

The Development Alternatives outlined in regards to the proposed Bellcan Golf Resort & Marina project is based on an articulation of those alternatives, where they exist, to demonstrate the first and second options that may be adopted in the best interest of the project and the integrity of the environment. This new approach is delineated by the different options that are available for discussion and the magnitude and scope of the related impact. The following sections summarize the different development alternatives and their related impacts to the receiving environment.

4.4.1 Potable Water Alternatives

Considering the different options for potable water sourcing, the proposed project has opted to consider three development alternatives. These three options will be looked at from all angles including their related impacts on the receiving environment. Table 4.1 summarizes the options evaluated for the proposed Bellcan Golf Resort & Marina development.

Incorporated into the options are also the associated components that will be required to be installed. In addition, the several treatment methods that will be implemented by each option will be explored. These alternatives are in response to the sourcing of potable water as defined in Section 3.2.3 and Table 3.1.

Alternative Sources of Potable Water for Bellcan Golf Resort & Marina

The required volume of 180,050 gallons/day will be primarily met by ground water abstraction as described previously (See Sections 3.2.2 and Table 3.1). Since the project has several

available resources in terms of water supply, various other potential sources were investigated to supply or supplement the primary source. Therefore in considering the developmental constraints, the following alternatives were examined.

- *Rainwater Harvesting*

Rainwater harvesting is the most inexpensive and environmentally safe method of obtaining potable water for the project site. The proposed development plans to harvest rainwater from the seasonal rains as part of their secondary source alternative. This option however, will be limited and will be used for minimal potable and non potable uses. In any event, rainwater will be sequestered from the individual roofs of buildings and stored in cisterns varying from 200 to 1,000 gallons. An alternative to having individual cisterns is to construct the storage tanks as an integral part of the residential building.

Gutters will be fitted to some of the buildings that will facilitate the rain water harvesting process. It is anticipated that the stored water will be disinfected by an approved disinfection system (MoH). This method may include ultraviolet radiation along with ozonation and chemical treatment, specifically chlorine. These methods can be individual or combined methods that would have the same end result. The stored water may be used for some construction works or as a supplementary use such as irrigating the golf course.

Climatologically, the site receives about 60 inches of rainfall (See Fig. 2.1 for 'Rainfall Isopleth map' and Section 2.1.1.1). This average rainfall is the lowest in the country and therefore it will be at the discretion of the proposed project and individual lot owners to install the necessary infrastructure to harvest the rain water and utilize it to supplement their personal water demand.

Rainwater Harvesting

Rain water will be collected and treated prior to consumption. Water treatment techniques for rainwater catchments systems will include:

- *Screening:* Strainers and leaf screens located in the gutters and downspouts will be used to prevent debris, like leaves, from entering the reservoir tank.

- *Settling.* Sedimentation within the tank is necessary to settle out any particulate matter and solids.

- *Filtering*. In-line multi-cartridge systems with activated charcoal will be used to remove potential contaminants either at the pump tank or tap.

- *Disinfecting*. The use of chemical treatment (chlorine, iodine), ultraviolet light, and/or ozonation will be used to kill microorganisms.

- *Belize Water Services(BWS)*

Belize Water Services Limited is presently Corozal Town's supplier of potable water and to the country on a whole. BWS is presently servicing the surrounding areas with potable water. The proposed golf resort development is located about 4 miles north from Corozal Town and therefore remotely located from any possible connection to the national provider, BWS or any rural transmission main.

BWSL's distribution lines are presently about a mile north of Alta Mira Village or about 3 miles from the project site. It is anticipated as development progresses, the distribution line will eventually extend to the project site. When this occurs, the project site will obtain potable water from the national provider to suffice part of the water demand.

- *Water Desalinization*

If the primary source of potable water is proven inadequate or insufficient in meeting the required demand, the project proponent will consider the installation of a water desalinization plant capable of supplementing or meeting the projected potable water demand for both the construction and operational phases.

This Water Desalinization Plant (Reverse Osmosis) will be located in the Back of House Area and will consist of the same wells utilized for ground water extraction where these will then become two abstraction wells in conjunction with a deep well for the brine to be injected and disposed. It is anticipated that the potable water generated by this process will be made adequate for drinking and bathing. With this, it is anticipated that the proposed project will install a 20,000 gallons a day water desalinization plant if required to supplement or meet the project's demand.

- *Importation*

Importation of potable water would only occur as a last resort if all the other alternatives were to fail in sufficing the potable water demand. Imported water would be pumped into the reservoir system that will serve as catchment for the rainwater. This method would be restricted and limited to important areas of the development only.

In considering the development alternatives for potable water sourcing, it will be up to the individual lot owner to implement these alternatives. These alternatives can also be beneficial in terms of reducing their dependency on a single source as well as to cut down the cost of potable water. In any event, the anticipated development will consider the adequate and efficient use of these potable water alternatives.

Doing this will ensure that the different influences that each alternative has on the environment is respected and taken into consideration. In any event, the anticipated Bellcan Golf Resort & Marina will implement stringent policies to ensure that water conservation measures are taken into account.

Table 4.1 Summary of Alternative Potable Water Sources

Option	Source	Rationale	Strategy	Impacts
1.0 Rainwater Harvesting	Rainwater Harvested from seasonal rains.	Harvest rain water from the seasonal rains thereby reducing the dependency on the proposed method and reducing the overall energy cost.	Construct cisterns apart or as an integral component of the construction of the residential buildings.	Water may not suffice proposed project, cross contamination of potable water sources due to its wide distribution network. Venture may be perfect for individual residents who wish to complement their primary source.
2.0 BWSL	Ground Water Abstraction	Supplement the potable water demand for the proposed project, or be sourced as a future primary option.	Install the necessary distribution line to project site and eventually hooking up to the development's own distribution system.	Installation of water lines may be too costly. Demand required by project may limit the production rates and hamper other distribution areas around Corozal Town.
3.0 Water Desalinization	Ground Water Abstraction	Utilize existing wells on project site for salt water desalinization.	Install the necessary equipment to generate fresh water from these wells which presently vary somewhat in salinity (<1ppt).	Extraction of water from these wells can have minor impacts in terms of the fresh water aquifers recharging rate etc.
4.0 Barging water to the project site from Corozal Town and neighboring communities.	BWSL	To be used in Emergency cases only	Truck and tanker method would require a dedicated water transfer station.	Trucking water regularly would be too expensive considering transportation costs

4.4.2 Wastewater Treatment Alternatives

It is anticipated that the proposed development will take into consideration the possible wastewater treatment alternatives described in Table 4.2. As mentioned previously, the project chose a package system with tertiary treatment capacity such as the BESST or its equivalent for its phase one development (See Section 3.3.3.1). Based on the availability of potable water, various alternatives were sought and therefore the project will consider the different criteria that will be influencing the proposed alternatives. The various options considered made the following assumptions:

Option # 1 "Individual Treatment Systems". This system assumed that each separate residential unit would consider installing individual 'treatment' units with the same secondary and tertiary treatment capacities. Individual units would be linked for disposal of treated wastewater. However, these systems would be individually owned instead of owned collectively.

Option # 2 "Household Systems". This option considered using Individual Septic Tank Systems, with appropriate leach fields, similar to what the neighboring community practices.

Table 4.2 Generic Evaluation of Wastewater Treatment Alternatives

Option	Rationale	Strategy	Impacts
1.0 'Individual Treatment Systems'	Individual treatment units in the buildings would treat waste more effectively and efficiently, lower impacts to receiving environment by means of secondary and tertiary treatment. Option may be applied to some of the development phases	Individual connections with mechanized pressure systems. Individual reservoir for treated wastewater and subsequent disposal of all treated wastewater (effluent).	Medium environmental impact due to individual residential volumes, but collectively, the potential impacts may be greater to the receiving environment. Possible failure of individual residential units making monitoring difficult.
2.0 Household Systems	Individually operated system can collect building's waste water and offer moderate treatment – Dimensions would vary according to quantity of wastewater generated by individual residences.	Gravity feed system involving leach or tile field disposal. Plumbing and gradient considerations.	Moderate environmental impacts due to the existing limestone conditions which limits the functionality of 'soak away' adequately disperse the effluent safely into the ground for secondary treatment. Possible leaching of effluents.

4.4.2.1 Disposal of Treated Wastewater

The project will primarily use the treated wastewater to irrigate the Championship Golf Course. However, there are several other disposal alternatives that can be considered, especially considering the magnitude and scope of the proposed project. Therefore, the consultancy team examined other alternatives that would safely dispose of the treated and post chlorinated wastewater. The various options considered are summarized in the following:

Table 4.3 Evaluation of Treated Wastewater Disposal

Option	Rationale	Strategy	Impacts
1.0 Non Potable uses other than for irrigation purposes	To maximize the use of the treated wastewater for non potable uses including fire fighting, dust suppression, rinsing of walkways and foot paths.	Install the necessary equipment for the aforementioned rationale along with any other potential non potable use such as irrigation of the lawns and hedgerows.	Minimal impact to the environment. Volume required for these activities is only a small fraction of the overall treated wastewater volume. The remaining volume may be used for irrigation purposes.
2.0 Diffusion into the sea by means of drainage canals	To discard the treated wastewater generated by the proposed project	Install the necessary infrastructure for the diffusion of the treated wastewater into the receiving environment. Discharge pipes would convey the effluent from the package plant's to a diffuser that will disperse the effluent.	The treated wastewater stream may have elevated levels of chlorine that is toxic to most aquatic organisms. Erosion problems may occur at diffusion site.
3.0 Diffusion in a deep injection well	Safe and rapid dispersal of treated wastewater.	Collection and subsequent diffusion of the treated and post chlorinated effluent by deep well injection.	Minimal impact considering the quality of the treated wastewater. Safe dosing time for residual chlorine to dissipate.
4.0 Irrigation purposes only (lawns, hedgerows, green areas etc.).	Rapid recycling of treated wastewater and subsequent dispersal of wastewater volumes	Install irrigation mechanisms in most residential and 'green' areas of the proposed development	Treated wastewater volume is too high for intended use. This activity cannot be viable during the rainy season experienced by the country.

4.4.3 Solid Waste Disposal Alternatives

In discussing the alternative analysis for the project's solid waste disposal methods, the development considered and evaluated two feasible disposal options. This approach is important in considering that this action would eliminate the dependency of having a single disposal method, especially considering the nature of the operation, and location of the project. In any event, the alternative options are always important in analyzing the true 'benefits' of employing the primary or chosen option.

Disposal Alternatives

Due to the pre-existing conditions at the local and designated solid waste disposal site, the alternatives for solid waste disposal were limited to three as listed in the following. It is important to mention that these disposal alternatives are not limited in scope. Table 4.4 summarizes the disposal alternatives for the proposed residential subdivision project considering the following elements:

- **Alternative # 1** – Separation of solid waste (organic and inorganic) with onsite burial of inorganic waste and composting of the organic portion.
- **Alternative # 2** – No separation of solid waste with disposal of waste at the municipal dumpsite.
- **Alternative # 3** – No separation of solid waste with onsite burial of both organic and inorganic waste.

Table 4.4 Domestic Waste Disposal Option

Option	Source	Rationale	Strategy	Impacts
1.0 Separation of solid waste with onsite burial of inorganics.	Construction of the project and its operational phase. Waste will be consistent with those generated by typical residential community	Utilize compost for project's benefit and discard inorganic waste on a vacant lot outside the proposed project. Inorganic waste can also be used for landfill purposes.	Judicious separation of organic waste for composing and the use of the inorganic waste for landfill use within the project.	Significantly impact the receiving environment by inadequate disposal of the solid waste. A disposal site on the project site would contaminate the site with pests and diseases as well as the need for adequate land. Possible water contamination as a result of improper disposal.

Option	Source	Rationale	Strategy	Impacts
2.0 Disposal of solid waste at municipal dumpsite without separation.	Construction and operational phases of the proposed project.	Elimination of generated waste without any environmental consequences to the project site.	Judicious collection of generated solid waste along with proper transportation of waste to municipal dumpsite.	Increase the existing pressure on the dumpsite which would magnify the additional environmental impacts, especially considering the waste volumes at 100 % capacity.
3.0 Onsite burial of generated solid waste.	Construction and operational phases of the proposed project.	Elimination of solid waste imploring the least costly method. Reduce overhead expenditures involving environmental management.	Judicious collection and transportation of generated waste to a dumpsite on the proposed project site where it would be 'safely' disposed.	Significantly impact the receiving environment. A disposal site on the project site would contaminate the site with pests and diseases as well as the need for useable land for development.
				Water contamination can also occur given the nature of the project location. Moreover, impacting a new site on the property would threaten the receiving environment.

4.4.4 Energy Generation Alternatives

Development alternatives are an important concept in any environmental impact assessment. As part of the alternative analysis for energy generation, the proposed project will explore its only available alternate source of energy that will suffice or supplement the energy demand. This approach is essential considering that this would simply eliminate the dependency of having a single source of energy. In addition, this assessment would promote the usage of new and developing technologies. The following section summarizes the source description along with their respective impacts.

Table 4.5 Alternative Analysis for Energy Generation

Option	Rationale	Strategy	Impacts
1.0 Diesel Generators	Commonly used supplementary source to national provider, these types of generators does provide continuous energy supply, especially considering the frequency of power outages. May require several units to satisfy the demand	Several units will be required to satisfy the project's demand. The sizing of the generators will be an important economic investment especially considering the size and magnitude of the operation.	Generators tend to create excessive noise pollution as a result of operation. Pollution risk due to accidental spill from fuel and oil storage tanks/lines can also occur. In addition, air pollution can arise from improper maintenance and combustion fumes can pose serious health risk to the humans and contaminate the air over prolonged exposure
2.0 LPG Generators	Alternative to diesel but with far less impacts	Same as above and considering the investment.	Fewer associated impacts and cleaner operations.
3.0 Combination of Generators with Alternative Energy Sources	Reduce the overall dependence of the primary option. It is anticipated that this option can be applied at whatever point along the development to reduce the project's consumption.	The proposed project plans to install solar panels, utilize natural gas and geothermal technology for heating and cooling, where appropriate to compensate the primary source which will be from BEL.	Potential impacts would be greater with diesel generators, esp. storage of large quantities of fuel. Alternative energy impacts are limited and restricted to the life span of the storage batteries which are far less than diesel generators but require huge investment.

4.4.5 Dredging and Land Reclamation

As presently conceived, the dredging operations extend well beyond the project's shoreline. This is necessary to compensate for the land reclamation activities that are needed to address the project's low lying areas. With this in mind, the following table summarizes the size of the dredging operations that would be carried out to generate the fill required for land reclamation processes.

Table 4.6 Dredging Alternative Options

Option	Rationale	Strategy	Impacts
1.0 Reduce the dredging area of the chosen option	Reduce impacts while obtaining some of the much needed fill material to reclaim the low lying portions of the project site.	Use of suction dredging machine along with a 'cutter head' to remove sediments from the sea floor. Use of pontoons to support pipeline network, construction of spoils containment areas.	Reduced potential negative and positive impacts associated with size reduction. Anticipated negative impacts would require successful mitigation measures to be in place. This alternative would not yield the required volume and so land base sources are required to compensate for the difference.
2.0 Dredging of the shoreline of the proposed project.	To obtain the necessary fill material for the filling of low lying areas of the proposed project site.	Use of suction dredging machine along with pad mounted excavators to dredge the shoreline.	Moderate impact considering the near shore morphology. Dredged areas would eliminate the possibility of having a smooth progressive seabed profile. Moreover, the area would be a hazard to bathers who would venture outside the natural beach areas.
3.0 Transportation of fill material from selected sources.	Reduce overall dredge related activity impacts on marine environment	Selection of potential sources with transportation of material primarily by trucks (dump trucks).	Increased transportation impacts - noise, dust and accidents/incidents, condition magnified considering road condition and nearby community. Expensive venture considering volume of materials

4.4.6 Marina Design Alternatives

As discussed previously, the construction of the marina will form an integral part of the proposed residential subdivision development. The proposed marina has several other design alternatives that can be used but would 'limit' the potential investment returns of the developer. The following section discusses several other marina design alternatives to comply with the project's TOR.

Table 4.7 Marina Design

Option	Rationale	Strategy	Impacts
1.0 Reduce the overall design of the anticipated marina component.	Enable a design that would be smaller but still able to offset the anticipated investment returns of the marina side lots	Conserve areas as much as possible without disrupting the natural environment; use the natural topography of the existing shoreline.	Design would cause project to require more fill material than is presently required. In addition, the development would suffer huge investment loss as these marina/waterways lots are part of the selling point of the proposed project. The reduction would also jeopardize the required amenities that will be offered to complement the marina.
2.0 Allow for one entrance to the marina	Minimize impact to the receiving environment by having one access channel or canal entrance.	Carryout the prescribed activity while 'limiting' the potential dredging impacts associated with the marina design.	This design would not promote the required flushing effects or water circulation within the marina. This strategy would also prove inefficient when considering emergency and evacuation scenarios.
3.0 Construction of smaller canals instead of two entrances.	Reduce the potential impact to the marine environment by having a series of small canals instead of two Caribbean Entrances.	Conserve the natural environment and limiting the overhead expenses associated with dredging and maintenance.	Canals would limit the vessel size and also limit the flushing effect of the marina. Canals would silt up faster thereby reducing the potential investment due to marina usage.

4.4.7 Golf Course Alternatives

The proposed golf course will be a world class championship golf course designed to attract the avid golfer to the development. Therefore, in considering the different golf designs throughout the world, the developers of the project chose the proposed design in order to adequately use the land as well as to maximize any potential investment returns. The following table summarizes the different development alternatives for the anticipated golf course.

Table 4.8 Golf Course Alternatives

Development Issue	**Option #1 & Justifications (Chosen Option)**	**Option #2 & Justifications**	**Option #3 & Justifications (Non-Development)**
1.0 Grass Selection	The developers opted to use Bermuda grass and other recommended species for the planting and sodding of the golf course	Use of other species would not perform as well and require additional inputs in terms of fertilizers and pesticides.	Grass selection is important in living up to the champion golf course standard. This Non –Development option should be avoided.
2.0 Number of Golf Holes	The type of golf course is adequate considering the number of playable golf holes. The developer chose to construct an 18 hole golf course.	A nine hole course can be contemplated but would not cater to the developer's intention of having some kind of international competition for the benefit of the developer and the surrounding community.	The development of the course is essential and a selling point for the anticipated project. Untapped resource considering its growing popularity.
3.0 Irrigation	The use of recycled treated wastewater is the chosen irrigation method for the golf course.	Water obtained from the ground water abstraction can be used considering the quantity that can be abstracted for this purpose. Perhaps a combination of Option # 1 and this option could prove viable in terms of the irrigation issues.	This activity is considered important since the entire course is grass and therefore requires adequate hydration for optimum play.

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
4.0 Chemical Use (pesticide/fertilizers)	Utilize those recommended by the PCB and MoA for maximum results	Import foreign chemicals with valid permit for use on the golf course.	These chemicals are essential in maintaining the course in optimum play.

4.4.8 Ecological Development Alternatives

In considering the ecological importance, mainly the conservation of the project's buffer zone and the coastline, the proposed project will incorporate a few development alternatives that will address the issue of conservation and protection. The following table summarizes the ecological alternatives of the proposed project.

Table 4.9 Ecological Alternatives

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
1.0 Land Clearance	Only the building footprint and other infrastructural areas will be cleared. The undeveloped areas will remain in its natural state as a sign of good stewardship.	Clearing the entire development with the exception of a few trees would allow for adequate land reclamation activities.	No-Action alternative would conserve the low lying areas but would not allow for any development thus loss of about 120 million in potential investment.
2.0 Land Reclamation	Reclamation activities to be carried within scope of development plan which is only on the buildings footprint, low lying areas and, infrastructure areas (golf course, roads, Back of House, marina etc.).	Reclaiming the entire area with additional fill obtained from the expansion of the burrow sites and inland sources.	No-Action alternative would immediately flood the project and its low lying areas. Condition magnified by global warming and tidal rise.
3.0 Open Space/Green Areas	11 % will be allotted for green areas/open spaces which is the minimum for some residential subdivision. This would reduce the carrying capacity of the project.	Reduced percentage in order to accommodate additional lots/units thereby securing further investment revenues – increase the carrying capacity	Lack of the 'open spaces' would increase the human carrying capacity and increase the impacts related to domestic and tourism activities.

4.4.9 Siting and Placement

The eventual siting and placement of the overall development and its associated components will play an integral part in the decision making process and more so in this section. The general principle involved in identifying option(s) to the proposed development is to ensure that the option chosen, which indeed may be the 'non development' option, would result in optimal returns in social and environmental capital: In other words the option chosen should bode well not only for the developer, but also for the environment and stakeholders in the area. The various options are detailed in Table 4.10 below.

Table 4.10 Options for Development

Development Issue	**Option #1 & Justifications (Chosen Option)**	**Option #2 & Justifications**	**Option #3 & Justifications (Non-Development)**
Overall Development	Location of development is consistent with the investor's development policy for optimum investment return. Location is also consistent geographic occurrence of primary resources.	Other areas would jeopardize investor's development plan as outlined by the owner. In addition, possible related impacts can be augmented especially the golf course and marina.	The project site in its predevelopment state has no economic impact, thus non-development option means total loss of capital investment and revenues.
Siting of Supporting Services for the development (Utility Zone or Back of House/Staging Area)	Chosen site has advantage in that all the necessary resources can be reached to the site. This makes it ideal especially considering that fuel for generators and boats as well as maintenance of the services.	The other location would be near the project's main entrance where space is immediately available. Services will have to be 'carried' further thus increasing potential impacts.	Non-development option is not feasible given that the support services are the back bone and life blood of the overall development.
Development Phases	The size of the development phases is consistent with the overall development concept. These phases have been designed to accommodate the residential lots and amenities such as the club houses, restaurants etc.	Use of zonation other than phases would be another option but construction would be carried out simultaneously on other zones.	The No Action option would deter from the development's economic input into the project and surrounding areas.

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Siting of the Golf Course component	Proposed location is excellent and within the development concept of the project. The location would maximize investment returns and would utilize the adequate available land to put a course.	Other areas can accommodate the golf course but would pose several other challenges such as available land space, number of course holes, water availability, number of circumventing lots.	This is one of the important essential components for the project to prove viable. The component is necessary for capital investment and revenue generation.
Siting of Water Hazards for Golf Course	Proposed locations of the water hazards or obstacles adequate considering the layout of the golf course and the placement of the golf holes.	Other areas can only accommodate the smaller water ponds but would jeopardize the golf course layout design.	These obstacles are a part of the game and important in promoting the ultimate golfing experience.
Siting of Beach or Swimming Areas	Sites chosen meet the required conditions given the proposed shoreline plan. These amenities will be designed to expand the range of experiences for the residents and visitors to the project. Designation of these areas will be essential in procuring potential investment.	Siting of Recreational Beach on southeastern shoreline would require more reclamation, potentially greater cost to the environment and would be less aesthetic.	Non-development option would forego any revenue generation possibilities and would eliminate one of the primary attractions to site.
Siting of the Resort Hotel	Proposed location is adequate and would not interfere with the livelihood of the other residents who would reside on the project site.	Any other area would interfere with the residential setting of the overall development Furthermore; this would minimize development and prolong investment return.	No –Action option would not maximize the potential investment return and would not support the intended interest.

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Road Network	Proposed road network layout is adequate considering that it is existent to some point and that it would enable all the lot owners to access their property. Moreover, it enables both residents and visitors to access the different amenities on site as well as safe passage through these areas.	The other road network would be limited to some lots that cannot be accessed by sea. Therefore there would be two transportation means to the project site.	Roads are an important element in residential subdivision and general mode of transportation. Without these roads, the project site would not be accessible and therefore loss of potential investment.
Entrances to Project	The project will have a primary road entrance to the development. There will also be a second road entrance but for the Supporting Services. The primary entrance is adequate for the safe movement of vehicles around the project site. Furthermore, the main entrance would allow for the surveillance of the traffic entering and leaving the project site.	Due to the design of the project, no other entrances can be accommodated that would be viable. Therefore the only main entrance has to be adequately designed and conceived.	The development requires roads to access the site. Without them the development would suffer serious losses as no supplies and potential investor would be able to enter or access the site.
Road Materials	Primary and secondary roads will be asphalted to ensure safe and adequate passage of residents, guests and visitors. This would further add ambience and entice potential homeowners and investors to the project.	Use of native dredged material for road construction purposes. This would further be compacted by heavy equipment and maintained by the intended residential subdivision management.	No Action alternative would be detrimental. The project requires some kind of road network to move residents, guests, visitors, staff materials, and supplies and to provide services to the site.

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Siting of the Marina	The proposed location is adequate considering the marina design and layout within the overall development. This area is adequate given the topography of the area and the need to place added incentives.	Placement of the marina on the northern extremes of the property would interfere with the neighboring project and occupy sensitive environments.	No- Action alternative restrict the development in exercising its developmental options. Loss of potential investment return by loss of amenities.
P-Dock or Marina Piers with Finger Piers	Placement of the pier is adequate considering the layout of the marina and its centralized activities. This area is exclusive for the berthing of the residential vessels with access to the project site and its corresponding amenities.	Placement of the piers near the dry dock. This would facilitate the residents with a more secure but distant location.	No-Action would not be viable. Piers are an important component in the water transportation mechanism as it facilitates the docking and servicing of marine vessels (boats, yachts, catamarans, sailboats etc.).
Sheet Pile and Bulkheads	An interlocking composite fiber glass system will be used to line about 60 % of the marina. This is primarily due to the layout design and the need for high tensile strength sea defenses in some areas. Furthermore, the use of the bulkhead as a mooring platform and walkway would benefit the project site and facilitate some form of transit. That is the lot owner may temporarily moor his/her vessel at this location.	The placement of palmetto stakes to line the marina would be more of a natural preference, however, this system is not recommended as it would not be able to support the land mass and would be subject to repeated maintenance (rotting).	It is essential that a portion of the marina be lined with some sort of protection. This is important in order to prevent erosion and losing land mass as a result of movement within the marina and its entrances.

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Siting of the Dry Dock	As presented, this choice would bode well with the area as well as with the prescribed functions. Area is strategic to the overall marina layout with adequate reach to and from other areas.	On the 'island' which would make it more accessible and open to everyone. This area would require additional mitigation measures considering the location and its immediate proximity to other amenities.	No- Action option would require outside sourcing of services which would impact investment and delay repair time. No such facility is located within the immediate communities.
Crossings (bridges and causeways)	Use of available materials for the construction of the causeways which include concrete and its derivative products. These structures should be able to support small vehicular traffic.	Use of natural materials such as wood to construct the bridges that will link the internal road network to the development.	These structures are important to link the development and furthermore promote safe transition between the project sites.
Siting of the Service Station	Placement of the fuel services at the Harbour Master area would facilitate the ease for mariners in navigating to the area as well as centrally located for the provision of water, energy, and food. The services would be better managed and much safer considering the placement of the berthing areas.	Placement of this service elsewhere would be unsuccessful considering the location of the service station and its docking services along with any other safety constraints and response time	No Action option would be detrimental considering the distance between the project site and other known service areas in Corozal Town, especially if the marina is to cater to small residential marine vessels.
Breakwaters	The project will utilize rocks and stones armored together to form breakwaters. This entails the use of natural materials to prevent siltation and enhance the flow of water as well as to dissipate the wave energy and prevent erosion.	The use of geotextile material to form breakwaters can be used but it can also limit water flow from one side to the other thereby increasing stagnation and possible eutrophication.	No-Action option would prove futile especially considering that the area can silt up easily. Thus, new bathymetry would increase wave energy and increase coastal erosion.

Development Issue	Option #1 & Justifications (Chosen Option)	Option #2 & Justifications	Option #3 & Justifications (Non-Development)
Siting of Security	Placement of the security services at the entrances and at the two Caribbean entrances is adequate considering that these areas are transited by staff, residents, guests and visitors. In addition this feature is an integral component of the overall development component, especially in considering today's security issues.	Placement of this service in other areas is also acceptable, barring any unforeseen or calamitous event delaying or preventing the security service to respond adequately.	This service is essential and is also a vital part in the overall development plan. Residents and home owners are asked to be acquainted with these areas as well as to be informed of any management policy.
Recreational Facilities	The placement of the beach clubs, golf clubs and fitness center are strategically placed for easy access and with the confines of the overall development. These recreational areas can be accessed by everyone visiting or residing on the project site. Moreover, safety is important.	The placement of these areas can be enhanced by the substitution of designated lots for recreational areas in order to better serve the residents and general visiting population.	The placement of these recreational areas other than the ones mentioned would jeopardize the development concept and possibly affect the economic investment.
Archaeological Mounds	Development will design around the important mounds and enhance the area by a museum.	Moving these mounds to an area where exhibits can be appreciated can also be considered especially if the mounds are not of significant importance.	No Action option would be adequate given the first option. Nevertheless, the second option can also be incorporated.

4.5 Conclusion

In accessing the comparative evaluation of the different development alternatives presented for the proposed project, the proponents plan to exercise these alternatives as seen fit. This of course, will fall within the scope of the overall environmental performance of the chosen 'alternative' and its associated impacts to the receiving environment.

In any event, it is necessary to layout the different options that are available in order to safe guard the environment and its interconnected elements. In considering the different development alternatives presented, the comparative process stems from both the rationale and strategy approach that was devised to discuss the alternative. Therefore, it is in the best interest of the governing body to ‘compare and evaluate’ the options described.