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ENVIRONMENTAL IMPACT ASSESSMENT

THE PROPOSED MOUNT EDGECOMBE CEMETERY, MOUNT EDGECOMBE/BELMONT, WESTMORELAND

FIRST DRAFT

Submitted to:

NATIONAL ENVIRONMENT AND PLANNING AGENCY
10 Caledonia Avenue
Kingston 5

By:

PARISH COUNCIL OF WESTMORELAND
Great Georges Street
P.O Box 3
Savanna-la-mar
Westmoreland

2008 October 6

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Presented to the National Environment and Planning Agency as a partial requirement for an Environmental Permit under Sections 8, 9 & 10 of the Natural Resources Conservation Act, 1996

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF PLATES

LIST OF MAPS

EXECUTIVE SUMMARY

E1 STUDY RATIONALE AND INTENDED USE OF THE ENVIRONMENTAL IMPACT ASSESSMENT

This Environmental Impact Assessment (EIA) is a requirement of the National Environment and Planning Agency (NEPA) under the Natural Resources Conservation (Permits and Licenses) Regulations, 1996. This Environmental Impact Assessment report is intended to describe the proposed project, provide the baseline information, outline the potential impacts of the proposed cemetery and suggest mitigation measures. These mitigation measures along with a proposed Monitoring and Management Plan when implemented will serve to minimize any potential negative impacts on the existing environment.

E2 THE PROPOSED ACTION AND ALTERNATIVE

E2.1 The proposed Mount Edgecombe Cemetery

This is a project of the Parish Council of Westmoreland which has allocated approximately 19 acres (7.7 hectares) of land at Mount Edgecombe/Belmont, Westmoreland for the development of a cemetery. The cemetery will provide 2,600 vaults for burials and a chapel to conduct funeral services.

E2.1.1 Infrastructure

Roads and Transportation – the property is located along a main coastal highway. Shared route taxis as well as mini-buses provide local transportation services in the development area.

Potable Water – the National Water Commission would ultimately be responsible for potable water supply to the property.

Electricity/Telephone – the Jamaica Public Service Company Limited (JPSCo.) would provide electricity to households from its sub station at Paradise. Cable and Wireless (Jamaica) Limited supplies land line and cellular services to residents in the area. Mobile service is also available through Mossel (Jamaica) Limited and Oceanic Digital Jamaica Limited (MiPhone).

Drainage – the relatively flat site topography and geomorphic influences provide easy management of site drainage. The aim of the proposed drainage system, however, is to channel storm water run-off through a system of drainage channels, culverts and cross drains.

Solid Waste Disposal – Solid waste from Mount Edgecombe/Belmont would be disposed of at the Retirement Landfill in Montego Bay.

Sewage – the development proposes a waste water treatment system that comprises a septic tank and an evaporation transpiration bed.

Construction Materials – basic construction materials such as sand, cement, marl and blocks would be obtained within the parish.

Landscaping – landscaping provides the means for making the site attractive and improving its visual aesthetic character and would partially restore the natural elements of the site.

E2.2 Alternatives to the Proposed Development

A. Alternative 1: "No Action"

The no – action alternative means that the project proponent would not proceed with the proposed cemetery and leaving the property in its present state.

E3 ENVIRONMENTAL RESOURCES

E3.1 Geography

E3.1.1 Climate

Precipitation – Rainfall data from the Meteorological Office of Jamaica over a thirty-year period (1951 – 1980) shows the mean monthly rainfall for Frome, Westmoreland as 181 mm with the highest of 308 mm in May followed by 294 mm in August.

Temperature – the coolest months are January and February with temperatures of 20.2 and 19.8 degrees Celsius respectively. The hottest months are in the summer (July, August and September) with temperatures of 31.1, 31.4 and 31 degrees Celsius respectively.

Humidity – Based on data for the Negril Point Light House the relative humidity of the area is higher during the morning hours, after which it declines rapidly in the afternoon hours.

E3.1.2 Hydrogeology

The proposed cemetery site is located within the Cabarita River hydrologic basin. The area is underlain by the Gibraltar-Bonnygate Formation of the White Limestone Group. The Gibraltar-Bonnygate Formation constitutes

the principal aquifer in the vicinity of Belmont and Mt. Edgecombe and is designated a Limestone Aquifer in the island's hydrostratigraphic sequence.

E3.1.3 Topography

The Belmont site is situated near the margin of a south west facing slope which rises from elevation of 7.6m in the south west to approximately 151m in the north east. The approximate site elevation for the proposed cemetery ranges from a low of 4.54m to a high of 21m above mean sea level.

E3.1.4 Risk Assessment of Natural Hazards

An assessment of the vulnerability is based on the physical characteristics of the site and surrounding areas and historical events which have impacted the area. The Belmont/Bluefields area has been affected mainly by earthquakes, inland flooding, storm surges and coastal flooding and landslides.

E3.1.5 Biological Resources

Bird Species - Forty-three (43) birds belonging to nineteen (19) species were observed during the point count period (see Appendix 2 & 3). Of these, four were Jamaican endemic species while an additional four were Jamaican Endemic sub-species.

Other Species - Five (5) species of butterflies were identified within the boundaries of the study area. All are regarded as species that are common at lower elevations where they occur across Jamaica.

In addition, the large *Euchroma gigantea* beetle was identified. This beetle is sometimes called the Ceiba Borer because its larvae are miners of the wood of the Cotton Tree (*Ceiba pentandra*) and related species. Accordingly the beetles were identified on a large cotton tree along the Belmont-Whitehouse Road.

E3.1.6 Noise Level

Based on the NEPA standard of 70 dBA for ambient noise, the level at the property at Belmont is relatively low.

E3.2 Socio – Economic Impact Assessment

The socio-economic, physical planning and spatial implications are significant given the type of development proposed for the area of western Jamaica. It is with this in mind that existing planning considerations related to economic, social and environmental indicators are examined. This would ensure that sustainable comprehensive social and economic community development is not compromised by the development that might raise compatible use issues.

E3.2.1 Existing Land Use

On site - the site currently consists of approximately 19 acres (7.7 hectares) of shrub, grassland and trees.

Surrounding land use – properties located to the south and east of the site show similar land use characteristics to that of the proposed development site. The Bluefields All-Age School was located immediately adjacent to the site; however, that school is now being replaced by a high school.

E3.2.2 Demographics

The census data for 2001 revealed that the population of Savanna-la-mar stood at 19,893 and was approximately 14.32 per cent of Westmoreland's total population (138,947). In 2001 the population density of the parish was 172 persons per square kilometre which at that time was 57.3 % higher than the island's mean figure of 73.34.

If it is assumed that an annual growth rate of about 1.6% for the period 1991 – 2001 in Westmoreland remains constant, it is projected that the population will reach approximately 22,859 and 24,688 in the years 2010 and 2015 respectively.

The population in the parish occupied 41,319 dwelling units in 2001, showing an increase from 34,287 in 1991.

E3.2.3 Economic Activity

The dominant economic activities in Westmoreland are agriculture, tourism and the distributive trade.

E3.2.4 Social Services and Amenities Infrastructure

The Bluefields Post Office serves the community within which the cemetery is proposed. While there are several schools in the region the Bluefields All-Age School was located adjacent to the site. That school is now being replaced by a high school that is under construction.

The Savanna-la-mar Hospital serves the region while the Savanna-la-mar and Bluefields Health Centres serve the community. Police Station is located in Bluefields. While there are few recreational facilities for the communities in the parish as a whole, schools, churches and community centres provide accommodation for community activities.

E3.2.5 Health and Safety

Essentially, Health and Safety considerations in a proposed development activity speak to minimizing and eliminating the acute and chronic effects of hazards on the safety and health of proposed visitors, mourners, employees at the cemetery and the general population.

E4 IMPACTS AND MITIGATION MEASURES

The potentially significant impacts of the development are outlined below.

Potential Impacts on Physical and Marine Resources and Mitigation

Table E1: Soils and the Coastal Environment: Significant Impacts and Mitigation Measures

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Soils	**Impact** No major impacts are expected from the proposed cemetery. The percolation test results show that the absorption properties of the soil vary from 4.7 minutes per cm to 9 minutes per cm (12 minutes per inch to 23 minutes per inch). This implies that the percolation rate of the soil is relatively low under worst case conditions and given that the average depth to groundwater is 5 metres, the percolation of fluids from the cemetery site into the groundwater is unlikely if the recommendation for best practices for vault construction is strictly followed.

Table E2: Hydrology and Water Quality: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Water quality	**Impact** Water quality is not likely to be affected during the construction/implementation of the cemetery.
Operation/Maintenance	
Water quality	**Impact** The groundwater resource in the area cannot be used for domestic purposes because of its high salinity. Hence, residents will not be affected by poor water quality during the operation phase of the cemetery.

Table E3: Local Climate: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Operation/Maintenance	
Local Climate	**Impact** It is likely that the micro-climate at the project site will be altered from its present condition due to the scale of the project. Operational aspects that are likely to alter micro-climate include: ▪ Reduced numbers of trees ▪ Increased paved surfaces (heat trapping) **Mitigation** It is recommended that the developer try to maintain as much tree cover as possible and replace as many of those removed as possible during landscaping.

Table E4: Hazards: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Operation/Maintenance	
Hazards	**Impacts** Following the occurrence of a natural disaster, the following effects can occur: ▪ Water pollution and increased public health risk. ▪ Disruption in essential services: power, water, communications. ▪ Blockage of access roads by debris. ▪ Wind, water or structural damage to property, and effects on business operations and insurance. **Mitigation** The vulnerability of the site would be tempered by the preparedness of the operators although the most vulnerable structure would be the Chapel. Proposed drainage solutions would reduce any impact of erosion of the burial sites. . It is recommended that a Disaster Management Plan be developed for the property, which should cover design and planning, preparedness aspects, and emergency response and recovery procedures at a minimum.

Impacts on the Terrestrial Resources and Mitigation

Table E5: Biology: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Biology	**Impact** *Flora* - the proposed development will not result in any major negative impact to the flora of the site. The vegetation of the proposed development area is severely degraded as tree density; tree diversity, canopy cover and species diversity were very low. **Mitigation** Although the impact of the development on the flora at the property will be minimal mitigation methods can, nonetheless, be implemented. The large tree of the property should be retained and the vegetation along the borders of the property should be maintained to mitigate against any impacts of flooding. **Impact** *Fauna* – There is low vegetation cover on the site. The existing fauna was predominantly composed of species that prefer human-disturbed habitats, early succession sites, or otherwise open, relatively dry and sunny habitats. **Mitigation** None necessary. **Impact** The indirect, off-site impacts of the development are potentially important. Specifically the disturbance of the soil of the site during the construction phase and also during its use as a cemetery could result in an increase in the movement of soil, rubble among other water transported material into the wetlands located south west of the. **Mitigation** Both deliberate activities such as dumping or unintentional impacts such as the movement of silt or solid materials by runoff should be prevented during all phases of the project. Additionally, the necessary precautionary actions should be taken to prevent the movement of sediment runoff due to either natural drainage or flood events.

Potential Socio- economic Impacts

Table E6: Aesthetics: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Scenic Vista	**Impact** It is not anticipated that the scenic vista of the area will be greatly affected by the development as few trees will be removed from the property. **Mitigation** The scenic vista of the area will be restored once construction activities are completed and the area landscaped. Additionally, specific trees will be marked for landscaping purposes and others required will be obtained.
Operation/Maintenance	
Scenic Vista	**Impact** It is not anticipated that there will be any negative impacts associated with the scenic vista of the site during the operation/maintenance phase as the development will be aesthetically pleasing.

Table E7: Air Quality: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Air Quality	**Impact** In general the impact is long term (limited to the construction phase). The operation of heavy-duty vehicles and equipment is likely to produce increased combustion emissions. Also, there is the potential for increased atmospheric dust from bare soils, stockpiles, and storage equipment. This impact is classified as minor because of: ▪ Relative isolation of most the site from residential and built areas. **Mitigation** Dust carrying equipment and facilities should be wetted frequently to minimize the amounts of dust affecting the site. Roads (paved and unpaved) should be wetted to lessen the possibility of dust emissions affecting site. The contractor should ensure that trucks carrying construction and solid materials are covered with tarpaulins to reduce air pollution. Vehicles should be properly maintained and serviced to reduce emissions. Dust masks and other personal protection equipment (PPE) should be provided wherever possible to workers on the site in order to safeguard their health.
Operation/Maintenance	
Air Quality	**Impact** There is expected to be an increase in particulate matter (dust) once the cemetery is in operation as a result of ground preparation activities (for burial plots). The proposed development is expected to have bare soils periodically, and has the potential to generate fugitive dust. However, as it relates to odour nuisances, there should be no impact as no cremations will take place on the property. **Mitigation** The wetting of the soil will have to be done to reduce the number of particulate matter in the atmosphere especially when wind speed increases.

Table E8: Noise and Vibration: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Noise & Vibration	**Impact** The impact of noise is classified as minor as the site (construction area) is not located in close proximity to the existing community. Noise and vibration are likely to be produced by the use of heavy machinery, vehicles and equipment. This above ambient level noise during construction is expected to affect on site workers and to a lesser degree the community. **Mitigation** These effects are not expected to be persistent after the construction period. This impact can be mitigated through the institution of an appropriate schedule of activities during the construction phase which will help to alleviate the impacts of increased noise, dust, etc. likely to result from construction activities. The activity schedule will be distributed to residents of the surrounding communities.
Operation/Maintenance	
Noise	**Impact** Noise levels should not be greatly impacted by the development as funeral ceremonies will occur during acceptable hours (daylight hours) and noise levels will comply with that of the Noise Abatement Act, 1997. The adjacent School (currently being constructed) may be affected by an increase in noise levels if funeral ceremonies are held during school hours. **Mitigation** The number of burials conducted on week-days would have to be limited to particular hours (mainly outside of school hours) of the day.

Table E9: Waste and Hazards: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Solid Waste	**Impact** Construction and other activities on site will produce solid waste in significant amounts. This includes various types of wastes including vegetation and construction debris, construction packaging materials, and domestic wastes from the construction camp. The effects of this include demand for land fill space, potential for loss of visual amenity if not properly stored and collected on site, and the potential for vermin to be attracted particularly in relation to food wastes from the construction camp. **Mitigation** Its effects can be effectively mitigated against by implementation of a Waste Management Plan at the construction camp. Organic waste, namely vegetation, would be composted on site and used for soil improvement (soil conditioning) during landscaping. To avoid the harmful effects of poor solid waste disposal adequate arrangement would be made with WPM or with a private contractor to dispose of solid waste at the authorized dumpsite at Retirement land fill, St. James. . Some materials can be beneficially re-used. It is expected that any top soil that is removed during grading would be stockpiled properly, and re-used during the final landscaping efforts as well as in the preparation of graves.

Table E10: Social Infrastructure: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Employment	**Impact** The proposed project provides the opportunity for employment of construction workers and tradesmen for the duration of construction period and eventually, the means of improving the socio-economic status of members of the community. New jobs created during the construction phase could result from activities in the development of infrastructure and the sewage treatment facility. Another beneficial consequence of the project is the income generated to shop owners and restaurant owners in the community through provision of materials and services to the project and others within nearby towns, such as, taxi and mini bus drivers would also profit.
Operation/Maintenance	
Employment	The opportunity for employment in the operation phase will be just as significant as, or even greater than the construction phase for e.g. grave diggers, grounds-men. Employment will also be provided in the informal sector e.g. vendors.

Table E11: Utilities and Services: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Utilities and Services	**Impact** The proposed cemetery will produce an unknown quantity of solid waste. This is considered a moderate environmental impact, as the exact quantity is unknown. The effects of this waste production can include: ▪ Increased demand for and consumption of limited land fill space and municipal collection services. ▪ Increased use of roads by collection trucks which could affect the surface of the road, congestion, fugitive dust along roads. ▪ Breeding of pests and disease vectors such as flies, vermin and roaches if storage areas are not hygienically maintained. ▪ Visual dis-amenity and odours, particularly if waste is not properly stored. **Mitigation** ▪ Adequate solid waste storage bins and other facilities all around the property. Storage containers should be tightly covered to prevent the breeding of mosquitoes and other vermin. ▪ Proper collection and disposal should be done everyday at all the sites of these garbage disposal facilities to ensure that there is no overloading of solid waste. **Impact** *Water* - the nature of the development requires water for everyday usage. There is also the need for water in case of fire. Landscaping also require very large quantities of water. Water in this area is provided from the Bluefields Pumping Station operated by the NWC. **Mitigation** Protection of recharge areas in the source catchment is the most effective means of mitigating against the increased demand, as it will safe guard water production. However, there are other measures that could be implemented by the developer, including: ▪ Re-use of treated wastewater and storm water for irrigation. ▪ There should be on site reserves of water in the event of disruption of public supplies (due to drought or heavy turbidity). ▪ Indigenous ornamental tree/plant species that do not require large amounts of water should be used for landscaping as far as possible.

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Utilities and Services	**Impact** *Energy Consumption* - it is not expected that the development will demand very large amounts of electricity and fuel on a daily basis. Although the power demand can probably be met by JPSCo. the issue pertains to the use of non-renewable resources, and the national fuel bill, as well as, contributions to green house gases, which are ultimately detrimental to the environment. **Mitigation** Cognizant of this, it is strongly recommended that the following mitigation measures be considered: ▪ There should be energy saving lighting installed for the chapel using lights and other energy star rated equipment.

Table E12: Cultural Resources: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Historical Resources	**Impact** It is not anticipated that there will be impacts associated with the historical resources of the site.

Table E13: Land Use and Planning: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Community Conservation	**Impact** The project will be located adjacent to a high school. **Mitigation** Dialogue will be initiated with the citizens, teachers and students to ensure that their interests are protected.

Table E14: Transportation and Traffic: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Traffic	**Impact** There will be an increase in traffic volume during the construction phase of the project. The travel of employees to and from work will increase traffic flow especially during peak hours, while the transportation of paving, filling and other construction material as well as solid waste may increase traffic flow during both peak and off-peak periods. An increase in traffic flow may inadvertently result in traffic accidents. **Mitigation** The development of a transport schedule; e.g. during the off-peak hours would help to alleviate the effects of traffic congestion. While the use of flag-men during the construction period could aid in the direction and flow of traffic during peak periods.
Operation/Maintenance	
Traffic	**Impact** There will be a significant increase in traffic levels especially on weekends when funeral ceremonies and processions are most likely to occur. **Mitigation** The use of police officers to lead funeral processions may reduce the increase in traffic which will be created by mourners when traveling to the cemetery.

E5 Management and Monitoring Plan

The major management and monitoring requirements are outlined below.

Table E15: Primary Management and Monitoring Plan

INDICATORS	AGENCY/INDIVIDUAL RESPONSIBLE
Preparation & Construction Phases	
1. Aesthetics	Developer/Contractor
2. Air Quality	Contractor
3. Health & Safety	Developer/Contractor
4. Noise	Developer
5. Solid Waste	Western Parks and Markets/Developer
6. Sewage Treatment Facility	Engineer/Contractor/Parish Council /Project Engineer
7. Traffic Control	Developer/Contractor
8. Building Plans	Westmoreland Parish Council/Contractor/ Developer
9. Flood Control Measures	Engineer/Contractor
10. Construction Materials	Contractor/Westmoreland Parish Council /Project Engineer
Operation and Maintenance Phases	
1. Effluent Quality	Developer/NWC
2. Public Amenities: Chapel	Developer
3. Education of employees and residents	NSWMA and Public Health Department
4. Potable Water	NWC/Developer
5. Removal of trees	NEPA/Developer
7. Noise	Police/Developer
8. Solid Waste	Developer
8. Marine Water Quality	Developer
9. Health and Safety	Westmoreland Parish Council

STUDY RATIONALE

This Environmental Impact Assessment (EIA) is a requirement of the National Environment and Planning Agency (NEPA) under the Natural Resources Conservation (Permits and Licences) Regulations, 1996. Under this regulation NEPA recommends an EIA for all cemetery developments. Based on the foregoing an application including the Project Information and the Permit Application Forms, following its scoping exercise along with a project brief were submitted. The request for the EIA was communicated to the project proponent. The information in the EIA is required to analyze the significant socio-economic and environmental effects of the Proposed Action and to determine whether a permit would be granted for the proposed cemetery.

The purpose of this EIA (conducted within the requirements of the Terms of Reference as shown in Appendix I) is to inform the decision makers in all agencies required to approve authorizing actions and the public in general regarding the anticipated significant environmental effects of the Proposed Action, and possible ways to mitigate these significant effects. The mitigation measures along with a proposed Monitoring and Management Plan when implemented will serve to limit the extent of negative impacts on the existing environment. This information will form the basis by which NEPA will further evaluate the project.

The information in this study, however, does not control the Agency's discretion on a project. At the end of the process (see Figure 1 below), it is expected that a permit will be granted by NEPA for the development.

The EIA contains the:

Table of Contents
Study Rationale
Chapter 1 – Introduction
Chapter 2 – The Proposed Action and Alternatives
Chapter 3 – Environmental Resources, Impacts and Mitigation
Chapter 4 – Regulatory Authorities and Legislation
Bibliography
Appendices

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- Leo Douglas, PhD (Candidate), M.Phil (Distinction)
- Mr. Norman Harris MSc. Engineering Geology, BSc

CHAPTER 1 INTRODUCTION

1.1 Background

This is a project of the Parish Council of Westmoreland. The Consultant was required to conduct and Environmental Impact Assessment for the approximately 19 acres (7.7 hectares) of land which have been earmarked at Mount Edgecombe/Belmont, Westmoreland for this proposed cemetery. The community falls on the south coast of the Jamaica and is located approximately 18 kilometres (11.18 miles) from the capital Savanna-la-mar (see

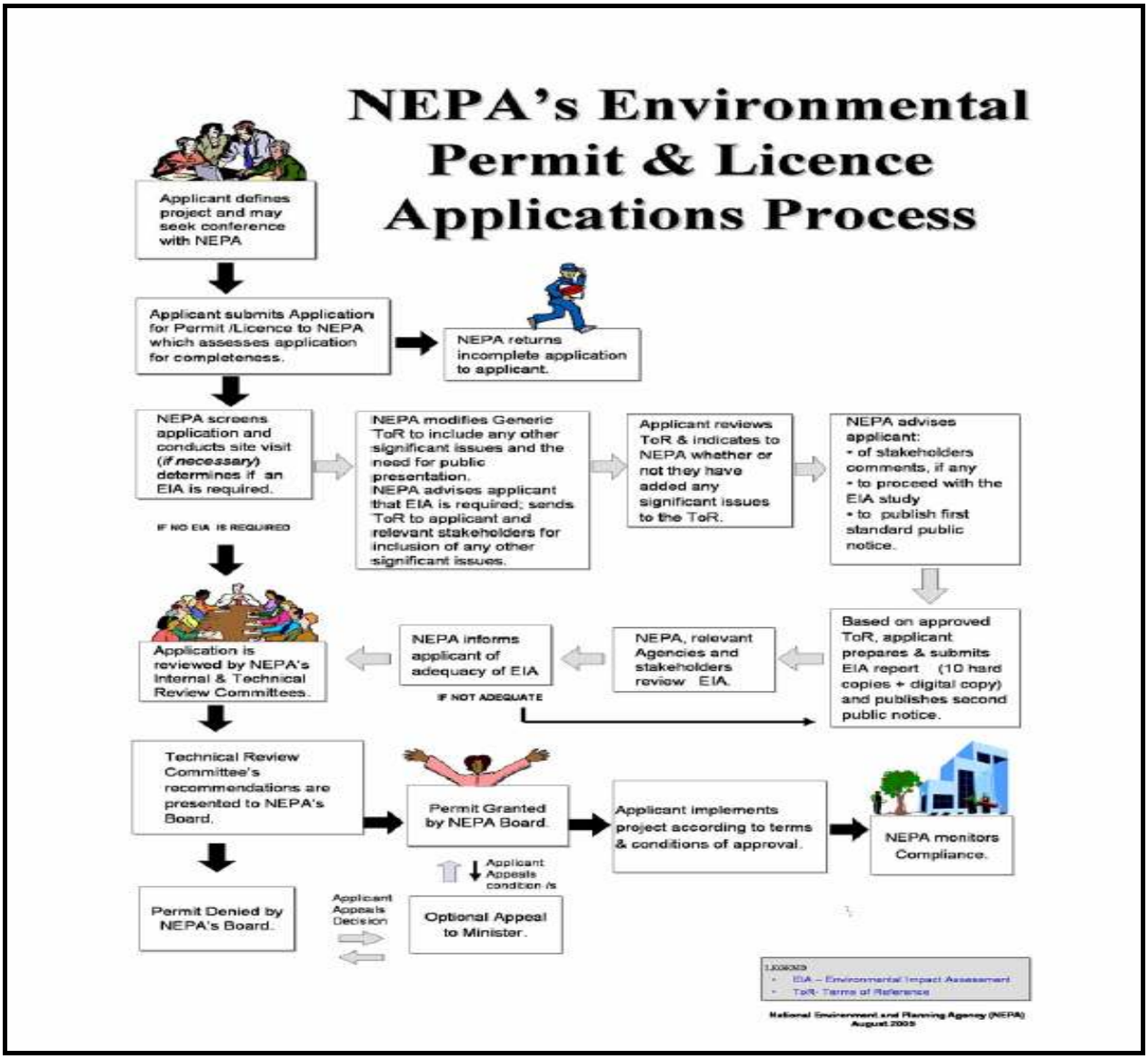


Figure 1: Steps in the Review of EIAs and Post Permit Granting Activities

Map 1 and Figure 2 below) and approximately 8 kilometres from the town of Whitehouse. Communities surrounding the site include Dunkeld, Mount Airy and Bluefields. The land has been made available through the Urban Development Corporation (UDC) and the site was examined by a group of agencies, environmental and legal bodies and was deemed suitable for that purpose (JIS, 2008).

The proposed development would go a long way in meeting the demand of the parish for a cemetery. This cemetery is intended to increase capacity as the publicly owned Tate Cemetery in Savanna-la-mar cemetery is nearing its carrying capacity and to meet the need of the area, including Whitehouse for the amenity. According to the Parish Council of Westmoreland they are currently fourteen (14) cemeteries in the parish of Westmoreland, 13 of which are owned by the Westmoreland Parish Council. Cemeteries require special consideration given their potential to create controversy

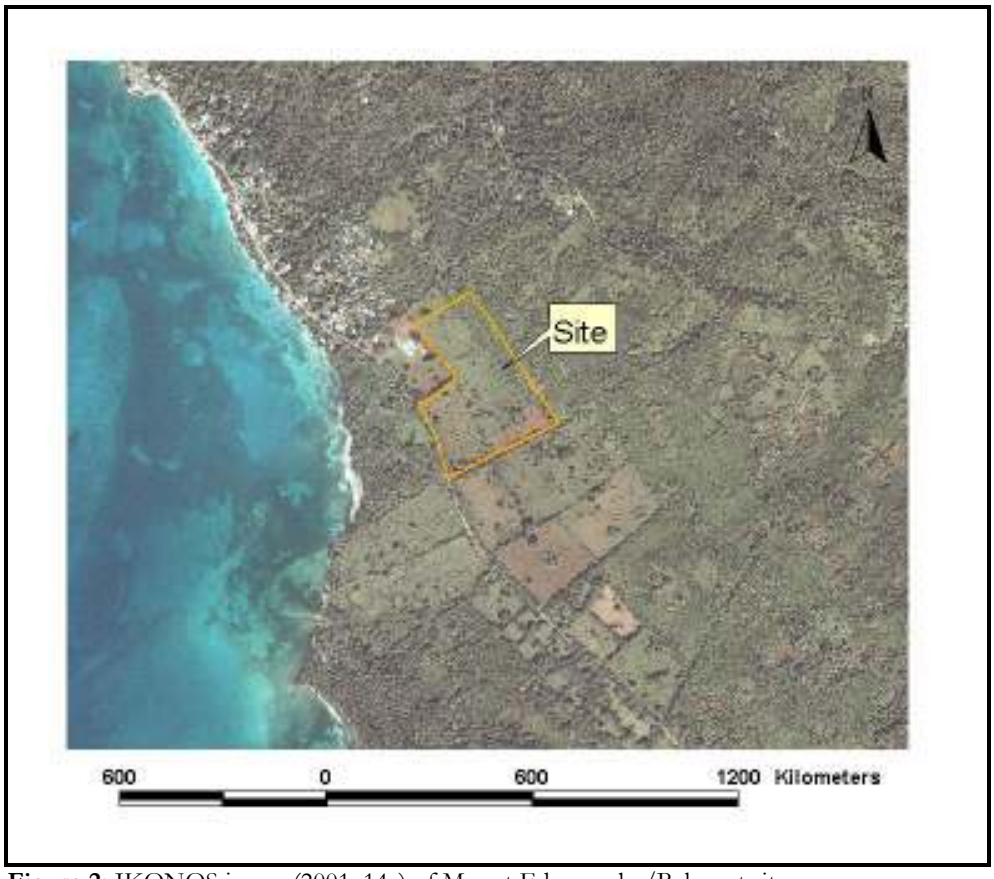


Figure 2: IKONOS image (2001, 14e) of Mount Edgecombe/Belmont site

Map 1: Showing location of the proposed development at Mount Edgecombe/Belmont, Westmoreland

1.2 Methodology

1.2.1 Soil Percolation Test

A total of five (5) test pits were dug using a backhoe as shown in Plate 1. One of the test pits, which was sited on the upper slope to the north east, was abandoned because of limestone rocks near the surface which could not be removed by the backhoe equipment.

Percolation tests were conducted in four (4) boreholes/test pits. Markers were strategically placed at the sides of each of the pit for measuring the fall in the level of water in order to determine the percolation rate of the soil.

The pits were partially filled with clean water (see Plate 2) and left to saturate for a minimum of 4 hours. After saturation, clean water was then poured into each pit and measurements conducted to determine the time taken for the water levels in the holes (pits) to fall.

The method was repeated until a constant time was achieved for the fall of 7.5cm (3 inches) of water in each of the 4 pits. The final percolation rate is determined by the time (minutes) taken for the water to fall 7.5cm (3 inches) into the ground and dividing by a factor of 3. The percolation rate is given in minutes per cm (minutes per inch).

Plate 1: Excavation of test pit for conducting percolation test with the assistance of a backhoe.

Plate 2: Clean water being poured in the test pit

1.2.2 Site Biology

1.2.2.1 Faunal Survey Methods

Sample Stations

The data for the study were collected 2007 June 24. The openness of the study area allowed for the collection of both fauna and flora at five (5) strategically placed sample stations that provided an even placement and

representative sample across the proposed development area. No sample station was closer than 200 metres to the next nearest station. In addition to the assessment of the development area, the vegetation of the adjoining wetland, which occurs off-site along the entire south-eastern border of the property was examined along a 150 metre transect immediately adjacent to the roadway.

1.2.2.2 Mammal and Herpetology (Reptile and Amphibian) Survey Method

At each sample station, the area within a circle of radius 20 metres, was closely investigated by examining all observable surfaces associated with soil, vegetation, and sheltered sites under both organic and inorganic matter. All vertebrate species present were observed, or evidence of their recent presence, such as droppings, pellets, skin, burrows, nests, tracks, etc., were recorded and the estimate of species abundances recorded using the DAFOR (Dominant, Abundant, Frequent, Occasional, Rare) Scale of Relative Abundance. Due to the low density of mammal species, all mammals (wild or domesticated) seen outside of sample periods and beyond the sample stations, but within the property boundaries, were also recorded.

1.2.2.3 Bird Survey Method

At each of the five (5) sample stations the census method used to quantify the bird population was by point counts. Point counts were used for the following two reasons:

(1) species abundance may be directly associated with habitat,

(2) the method is ideal for studies in which the observer is sampling in sites with very different levels of vegetation density.

As a result, point counts are unlikely to exaggerate the abundance of birds in more open habitats relative to closed ones where birds are likely to flee, and thus increase their visibility. (Bibby et al. 1992). This is important, because of the effect of a potential bias due to changes in the density of vegetation and animal detectability across the biological communities surveyed as was the case at Belmont, Westmoreland.

Each point count lasted for 10 minutes, during which time all species and numbers of individuals of each species both seen and heard were recorded. Only one census was conducted for each point count. The point count results are presented in Appendix # 2.

1.2.2.4 Lepidoptera Survey

All Lepidoptera species encountered around the sample stations, either stationary or flying, were identified and recorded according to Brown (1972).

1.2.3 Vegetation Survey Method

The vegetation of the study area was assessed by identifying plants along a 10 metre transect at the five (5) sample stations. Along each transect, the vegetation within a 1.5 metre band was sampled by recording:

1. Tree species (for the purpose of this study, a tree was defined as any plant (succulent or woody) that had a diameter greater than 5 cm measured at a height of 1.4 meters above ground level (that is, at an approximate breast height above the ground).
2. Canopy height was also recorded in areas where there was relatively continuous canopy cover over the transect area.

Tree species were identified according to Adams (1972) and according to Parker (2003). The relative abundances of the species observed were ranked using the DAFOR Scale of Relative Abundance. The results of this assessment are presented in Appendix # 1.

1.2.4 Noise Assessment Methods

The noise level characteristics of the site were taken 2008 September 04 at one (1) location along the southern boundary of the property (close to the main road) on the property for the proposed cemetery at approximately 11:00 am with the Amprobe Sound Level Meter. The instrument was set at low range (which is appropriate for measuring average sound levels) and slow response (for measuring stable noise) and function A (for general noise sound levels).

1.2.5 Socio – Economic Impact Assessment Methods

Data to support the Socio–economic Impact Assessment (SIA) were collected through primary and secondary data sources and through the use of Geographic Information Systems (GIS):

1. Primary data through:
   - reconnaissance of the site and adjacent areas
   - interviews with and socio–economic survey among local stakeholders
   - telephone interviews with personnel of relevant government agencies and service providers such as Cable and Wireless and Jamaica Public Service Company Limited

The socio-economic survey was conducted in 69 households (see Table 1) on 2008 January 10 between the hours of approximately 10 am and 3.30 pm via face-to-face interviews with persons over the age of 18 years. The survey instrument was a questionnaire consisting of 20 open-ended and closed-ended questions (see Appendix III). The key points of the survey will be alluded to in the socio-economic impact section of the document while the overall findings are presented in Appendix IV.

The survey was conducted in the Enumeration District (ED) within which the site falls, as well as, neighbouring communities which fell within a 1.5 km radius of the property. Map 2 displays the five (5) EDs, within which the survey was conducted.

The number of households per ED was determined by using the quota sampling method.

Table 1: The number of households per Enumeration Districts

ENUMERATION DISTRICTS	NUMBER OF HOUSEHOLDS	% OF TOTAL HOUSEHOLDS	FREQUENCY
E075	72	10	7
E076	194	10	19
E077	221	10	22
E078	117	10	21
E079	95	10	9
TOTAL	**699**		**69**

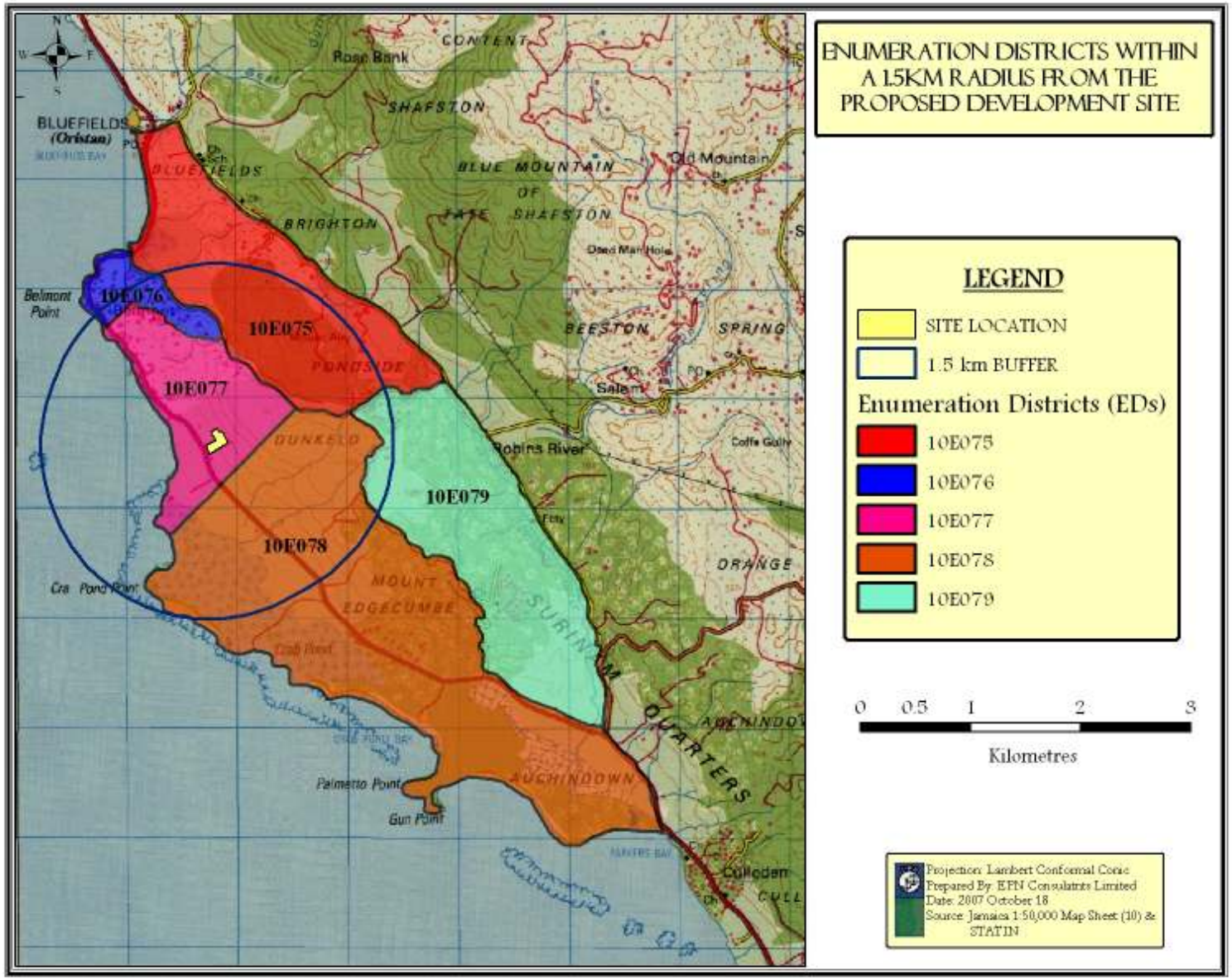
The steps taken to determine the number of surveys per ED are as follows:

1. Find the number of households within EDs located within a 1.5km radius from the site
2. Find 10 percent of total households in each ED (see Table 1).

Obtaining Secondary data through:

- Analysis of National Population 1991 and 2001 Census Data
- Documentary research of information from government institutions, such as, the National Environment and Planning Agency (NEPA), Ministry of Education and Youth, the Jamaica Tourist Board (JTB), the Social Development Commission (SDC), the Statistical Institute of Jamaica (STATIN) and the National Works Agency (NWA).

3. The use of Geographic Information System (GIS)
    - Review of the 2001 Population Census, based on Enumeration District and Traffic Count data sets prepared by NWA.



Map 2: Showing the Enumeration Districts within which the socio-economic surveys were conducted.

CHAPTER 2 THE PROPOSED ACTION AND ALTERNATIVES

2.1 The Proposed Mount Edgecombe Cemetery, Westmoreland

The project consists of the following:

Vaults – there will be 2,600 vaults; 1,600 double vaults and 1000 single vaults which will be sealed with mortar. The size of each vault will be 1,200m X 2,250m. The base of the vaults will be sealed with concrete to a thickness of 100mm as shown in Appendix II.

Chapel – a chapel to conduct funeral services will be constructed and will have the capacity to seat up to 80 persons.

Parking – Parking will be made available.

Landscaped Area – open spaces verges and roadways will be landscaped

Access road – a main access road to the property is proposed leading from the Class A main road.

2.1.1 Proposed Burial Process

The proposed burial process for the cemetery is outlined below:

1. Cemetery workers will cut the grave using a backhoe or other mechanical equipment to a depth of 6 feet (1.8 meters).
2. The material dug up (excavated spoil) will be piled close to the grave for backfilling.
3. A vault (1,200m X 2,250m) will be constructed and sealed with concrete to a thickness of 100mm so as to prevent grave leachate from entering the soil and the groundwater system.
4. The casket will then be lowered into the vault and the grave backfilled (leveled) to complete burial.

The guidelines established by the World Health Organization will be adhered to. These guidelines include:

1. The base of all burial pits on the site must maintain a minimum of one metre clearance above the highest natural water table. (Any variability in the water table should be taken into account.)
2. Burial excavations should be backfilled as soon as the remains are interred, providing a minimum of one metre soil cover at the surface.

2.1.2 Justification for Site

This site was chosen based on two (4) main considerations: (1) the site is government owned (2) the site is accessible (3) there were no obvious issues related to environmental sustainability (4) the development would not breach Development Order guidelines.

2.2 Physical Infrastructure

2.2.1 Roads, Transportation, Traffic

The structure of the road network is simple; it features a main Class A coastal road which runs from Savanna-la-mar to Whitehouse. The construction of a main access road to the site is also proposed by the project proponent. The transportation of construction materials, solid waste and the labour force would increase traffic flow within the development area. The additional traffic could have a moderate effect on traffic flow especially during peak hours.

Mini – buses and route taxis provide the main form of transportation for residents of the development area.

2.2.2 Potable Water

The National Water Commission (NWC) would ultimately be responsible for potable water supply to the project site.

2.2.3 Electricity/Telephone

The Jamaica Public Service Company Limited (JPSCo.) will provide electricity to the development from its sub station at Paradise.

Cable and Wireless (Jamaica) Limited (C&WJ) is the main provider of land telephone service, which is available and accessible to the Mount Edgecombe/Belmont area.

Mobile phone services to the development area are provided by several companies in the development area, with the main ones being C&WJ, Mossel (Jamaica) Limited and MiPhone. In the case of land lines, the main infrastructure needs are cables while for mobile service it is cellular base stations within a five mile radius.

2.2.4 Drainage

The relatively flat site topography and geomorphic influences provide easy management of site drainage. The aim of the proposed drainage system, however, is to channel storm water run-off through a system of drainage channels,

culverts and cross drains and into an existing retention area. The concrete culverts will be utilized to accommodate storm water flows where new roads cross designed drainage paths.

2.2.5 Waste Disposal

i. Solid Waste Disposal

Solid waste from the site would be disposed of at the Retirement Landfill in Montego Bay. Solid waste disposal is the responsibility of the Western Parks and Markets (WPM) Waste Management Limited. Approval for accessing the service will be obtained from the National Solid Waste Management Authority (NSWMA).

As it relates to construction waste, it is expected that private trucks will be hired to remove construction and other debris from the site.

ii. Sewage

The development proposes the use of a septic tank and evaporation transpiration bed which will be placed strategically on the property in order to facilitate the adequate treatment of waste water to the tertiary level.

2.2.6 Spoils

Materials required for filling areas such, as low points, in the road profile, would be sourced from materials excavated from the site if found suitable. Surplus material would be incorporated into the landscape architecture for the project.

2.2.7 Construction Materials

Basic construction materials such as, sand, cement, marl and blocks would be obtained within the parish. This would have the effect of reducing transportation costs and the use of energy (petrol). Cement, sand, marl and blocks would be obtained from authorized sources, which would not affect the local environment negatively. As far as possible, other required materials will be sourced locally. Imported goods will be used where it is essential or unavoidable.

2.2.8 Landscaping

Landscaping would be a beneficial activity especially because of all the negative connotations which come along with the development of a cemetery. Apart from making the burial grounds attractive and improving its visual aesthetic character, landscaping would improve upon the natural elements of the site. The Landscape Plan will visualize the landscaping of open spaces, along verges and roadways.

2.3 Alternatives to the proposed development

2.3.1 Alternative 1: "No Action"

The no–action alternative means that the project proponent would not proceed with the development of the proposed cemetery.

In the event that this development does not proceed, it is likely that the site would remain undeveloped for some time allowing it to remain as shrub and grassland. The impact on the physical environment would, therefore, be nil.

2.4 Socio-economic Integration

The developers of the proposed site envisage an environmentally sound development which will meet the needs of the population of Westmoreland for the burial of their loved ones in a suitable environment. Potentially, the anticipated effects of the development would result in significant social, economic and cultural impacts locally. Socially, the cemetery would serve the communities of Belmont, Whitehouse, Bluefields and the entire parish in general; economically, the opportunities for employment will arise as local shop keepers/restaurants would expect patronage from mourners from attending burial/funeral services. Cultural practices related to burials would be facilitated; however, the cemetery essentially discourages burial in family plots.

CHAPTER 3 ENVIRONMENTAL RESOURCES, IMPACTS AND MITIGATION

3.1 The Physical Environment

3.1.1 Climate

Jamaica is described as having a subtropical or marine tropical climate because of its location at latitude 18° N. The country is characterized by north east trade winds, constant year round high temperatures and humidity with little variation. Meteorological data sets from the National Meteorological Service of Jamaica are available for two main stations; the Sangster International Airport (MBJ) and the Norman Manley International Airport (NMIA). Since the study area is in much closer proximity to MBJ (approximately 42 km to the north-north-east of the site) the meteorological data at that station is considered representative of the site. Climatological data for the Negril Point Lighthouse and Frome in Westmoreland are also representative of the site based on their location and elevation.

i. Precipitation

Rainfall data (see Figure 3) from the Meteorological Office of Jamaica over a thirty-year period (1951 – 1980) shows the mean monthly rainfall for Frome, Westmoreland as 181 mm with a high of 308 mm in May followed by 294 mm in August.

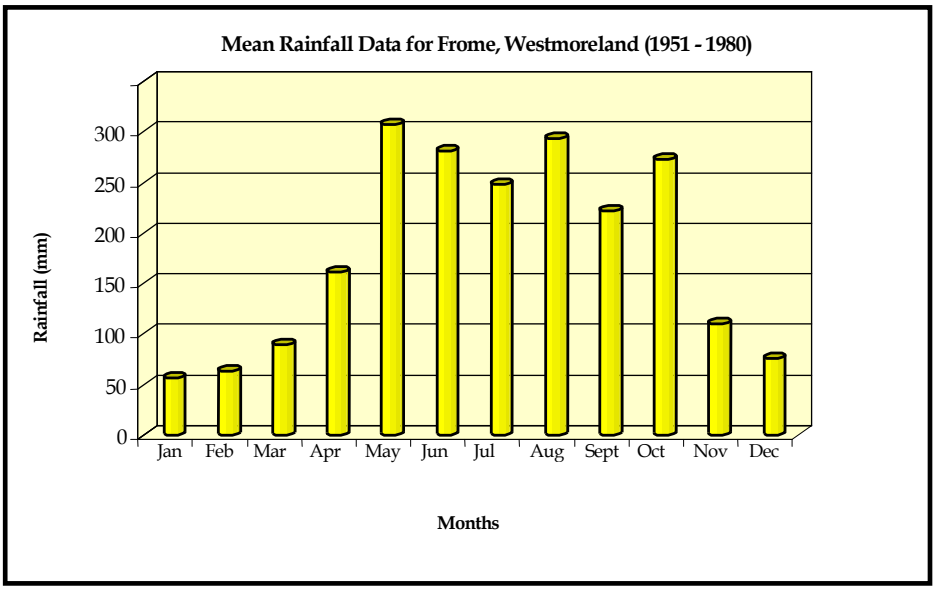


Figure 3: Rainfall Data for Frome, Westmoreland (1951-1980)
Source: National Meteorological Service of Jamaica

The 30–year mean total annual rainfall for Frome is 2,182 mm. The mean monthly rainfall for Negril Point Lighthouse is 113 mm with a high of 166 mm in October and 164 mm in May. The 30–year mean total annual rainfall for Negril Point Lighthouse is 1,359 mm.

ii. Temperature

Based on temperature readings at the Negril Point Light House, Westmoreland the coolest months are January and February with temperatures of 20.7 and 20.6 degrees Celsius respectively. The hottest months are in the summer (July, August and September) with temperatures of 31.7, 32.2, and 31.9 degrees Celsius respectively.

iii. Humidity

Based on data for the Negril Point Lighthouse the relative humidity of the area is higher during the morning hours, after which it declines rapidly in the afternoon hours (see Table 2). Relative humidity varies between 81% and 87% in the morning at 7:00 am, and between 61% and 69% in the afternoon at 1:00 pm.

Table 2: Mean Relative Humidity & Sunshine for the Study Area (1951 – 1980)

Month	Relative Humidity (%) (at 7 am)	Relative Humidity (%) (at 1 pm)	Sunshine (Hrs)
January	82	61	6.1
February	81	61	6.4
March	82	61	8.6
April	82	62	8.2
May	82	65	7.8
June	81	67	7.9
July	84	66	8.2
August	85	66	8.3
September	86	68	7.9
October	87	68	7.8
November	82	69	7.9
December	82	69	8.0

(Source: National Meteorological Service of Jamaica)

iv. Daylight Hours

The daylight hours for the area are very typical of areas in this latitude. These hours vary between winter and summer by roughly 1 hour and 20 minutes with the longest days in July and the shortest in January.

v. Winds

Winds in the area predominantly blow from the north and north-east. This is reflective of the effects of the northeast trades that incidentally tend to be strongest during the cooler months of the year, for example, higher wind speeds (>16 kph) occur between December and mid February, when they are strongest along

with the effects of winter storm fronts from the north. The period July to mid-November generally marks a period of relatively calmer conditions.

3.1.2 Geology

The geology of the Belmont property and its environs is comprised of Gibraltrar-Bonnygate Limestone of the White Limestone Group and Alluvium derived from the deposition of weathered soil from the upper slopes to the north and northeast (Figure 3).

The Gibraltrar - Bonnygate Limestone dominates the site and adjoining areas located to the north, east and west of the property. It consists of a series of evenly bedded, white, somewhat chalky micrites with occasional marly horizons. On the site, limestone outcrops were limited to surface features interspersed with thin lateritic (residual) soils on gentle to moderate slopes on the north and north east. The more chalky variety is also evident on the site.

Alluvial soil is located immediately to the south west of the property that is dominated by marsh and swamp land.

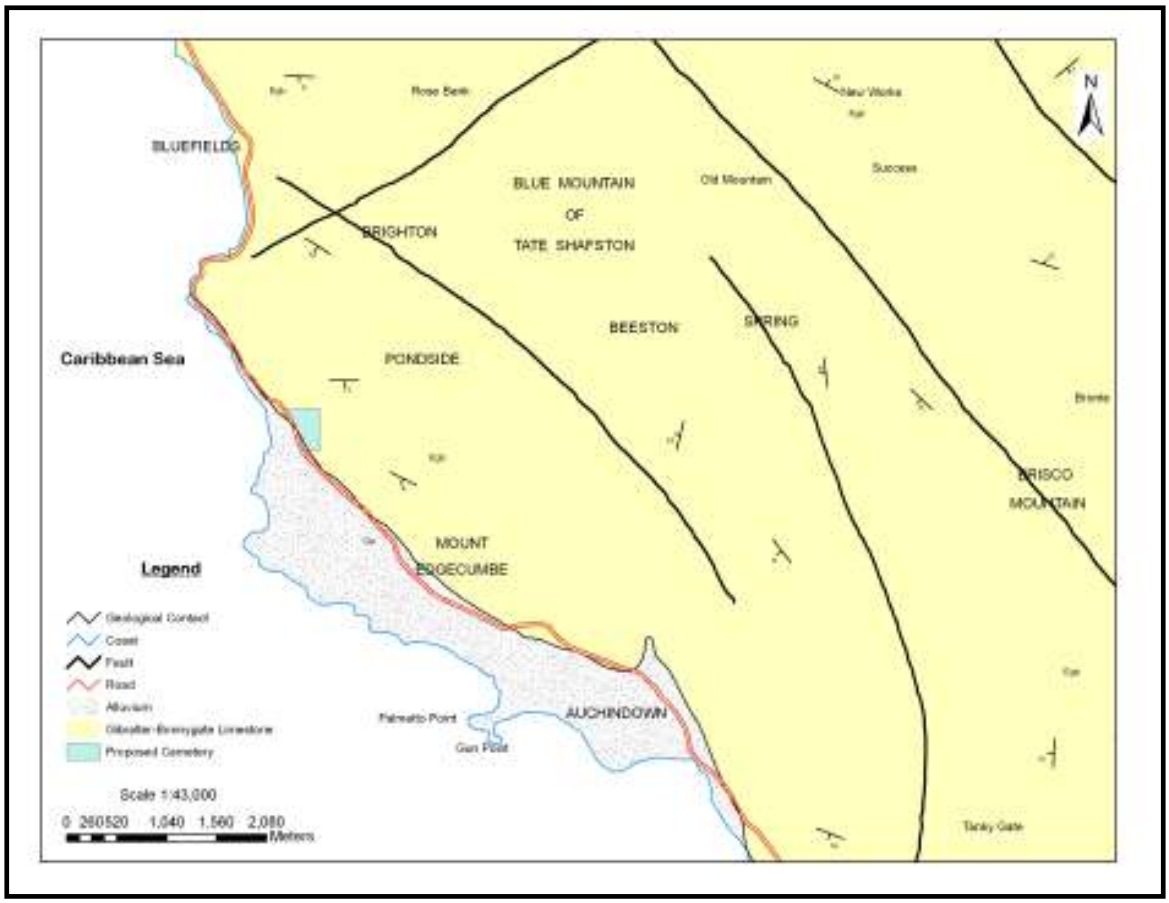
Information from the Newmarket 1:50,000 Geology Sheet 5 shown in Map 3 below indicates that there are no geological faults on the site. The nearest geological fault is estimated to be 600 metres to the north east and therefore has no influence on the property.

3.1.3 Topography

The Belmont site is situated near the margin of a south west facing slope which rises from elevation of 7.6 m in the south west to approximately 151m in the north east. The approximate site elevation for the proposed cemetery ranges from a low of 4.54 m to a high of 21 m above mean sea level.

The Belmont property and surrounding areas exhibit a regular and somewhat monotonous landscape with some minor variations in terrain features. On the southwest, the land is flat to gentle sloping, consisting of gradients of approximately 4-6 degrees, while towards the north and north east, the land rises gradually to slopes of 10-13 degrees (Plates 3 and 4).

North east of the property, the land rises gradually where it culminates into conical and semi-conical hills, typical of less immature limestone karst topography. South east of the site, the topographic features change into a marsh/wetland environment and the terrain flattens out into the Caribbean Sea (Plate 5).



Map 3: Geology of Mount Edgecombe/Belmont and surrounding areas
Source: Newmarket Geology Sheet 5, Mines and Geology Division

Plate 3: Flat to gentle sloping land located on the proposed Belmont Cemetery site (looking towards the north east).

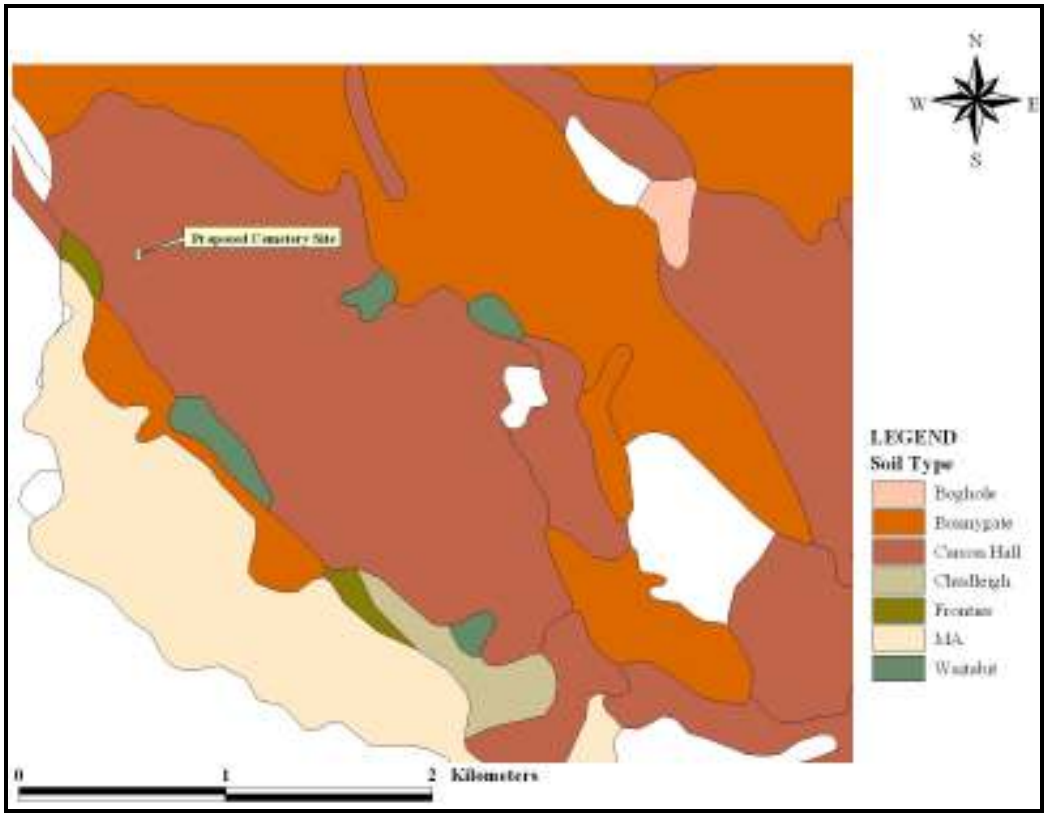
Plate 4: The slope on Belmont site rises gradually to the north east (background), grading into a more moderately sloping landscape.

Plate 5: Looking towards the south: Belmont property slopes gently towards the coast and the Caribbean Sea (in background).

3.1.4 Soils

Typically, reddish brown lateritic soil derived from the leaching of the limestone is found on the south western half of the property (see Map 4). An excavated area adjoining the proposed cemetery site exposes an estimated 1 metre thick reddish brown terra rossa soil on the flat to gentle slope towards the south (see Plate 6). Further to the north and north east, the soil thins out and limestone outcrops are interspersed with very thin soils where the land rises moderately.

It is estimated that approximately 40 to 50 percent of the property is located on soil not exceeding 30 cm in thickness which indicates that the underlying limestone is very close to the surface. This is clearly evident on moderate slopes located on the north eastern half of the property.



Map 4: Soil map for proposed Belmont cemetery site, Westmoreland
Source: (Rural Physical Planning Unit, Ministry of Agriculture)

3.1.4.1 Soil percolation test

The soils encountered in the test pits (see Map 5) can be described as deep, reddish brown clayey silt (lateritic soils) (see Plate 6) with varying thicknesses from 0.6 metre (2 ft) to 1.2 metre (4 ft). Below the clayey silt soil is white, marly limestone, limestone cobbles and boulders mixed with varying proportions of reddish brown clayey silt soil (see Figure 4). The depth of the test pits vary from 1.12 metres (3.7ft) to 1.5 metres (5.ft) and is dependent on the depth to which limestone rock is encountered in the pits (see Table 3).

The percolation test results show that the absorption properties of the soil vary from 4.7 minutes per cm to 9 minutes per cm (12 minutes per inch to 23 minutes per inch) (see Plate7). This implies that the percolation rate (see Table 3) of the soil is relatively low under worst case conditions and given that the average depth to groundwater is 5 metres, the percolation of fluids from the cemetery site into the groundwater is unlikely if the recommendation for

best practices for vault construction is strictly followed. In addition, the groundwater resource in the area cannot be used for domestic purposes because of its high salinity.

Table 3: Percolation test results for 4 test pits at proposed Belmont cemetery site

TEST PIT #	DEPTH		PERCOLATION RATE	
	Ft	Metres	min/inch	min/cm
1	5	1.50	17	6.7
2	4	1.20	23	9
3	4.3	1.30	12	4.7
4	3.7	1.12	21	8.3

Source: Soil Percolation tests

Plate 6: Test pit left to saturate before percolation test measurements are conducted. Note deep, reddish brown lateritic soil in and around the test pit

Plate 7: Measurement of percolation rate conducted in test pit.

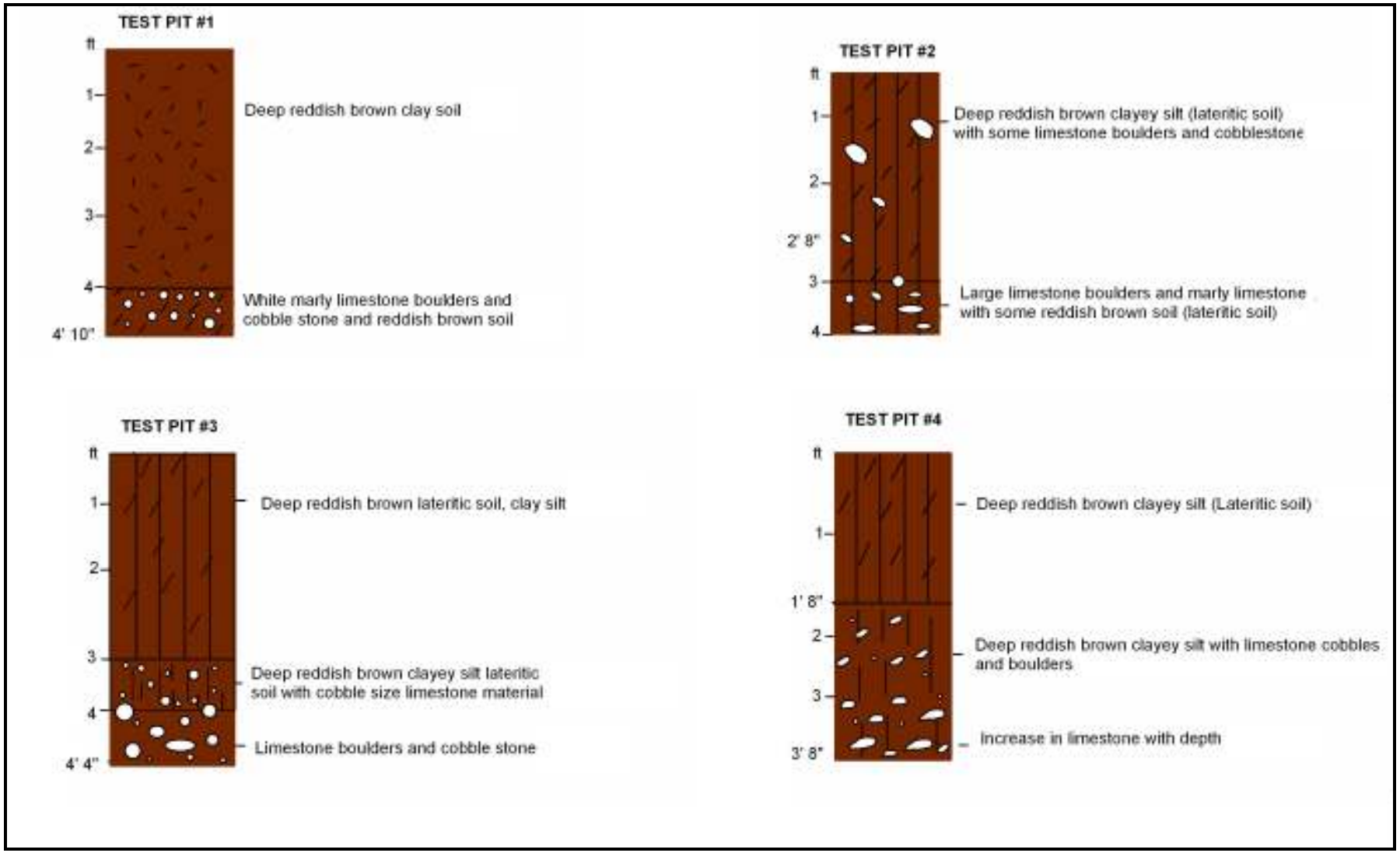
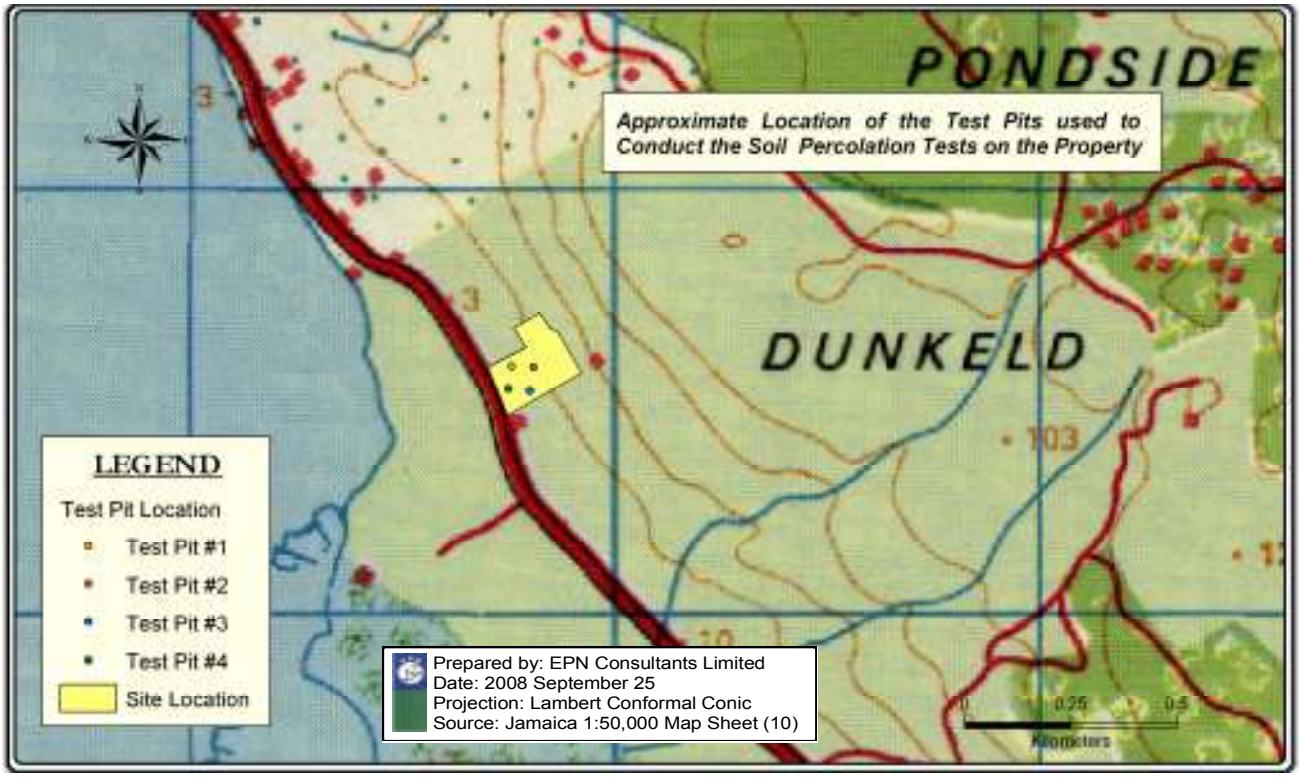


Figure 4: Test Pit Logs for the soil percolation test



Map 5: The approximate location of the test pits.

3.1.5 Drainage

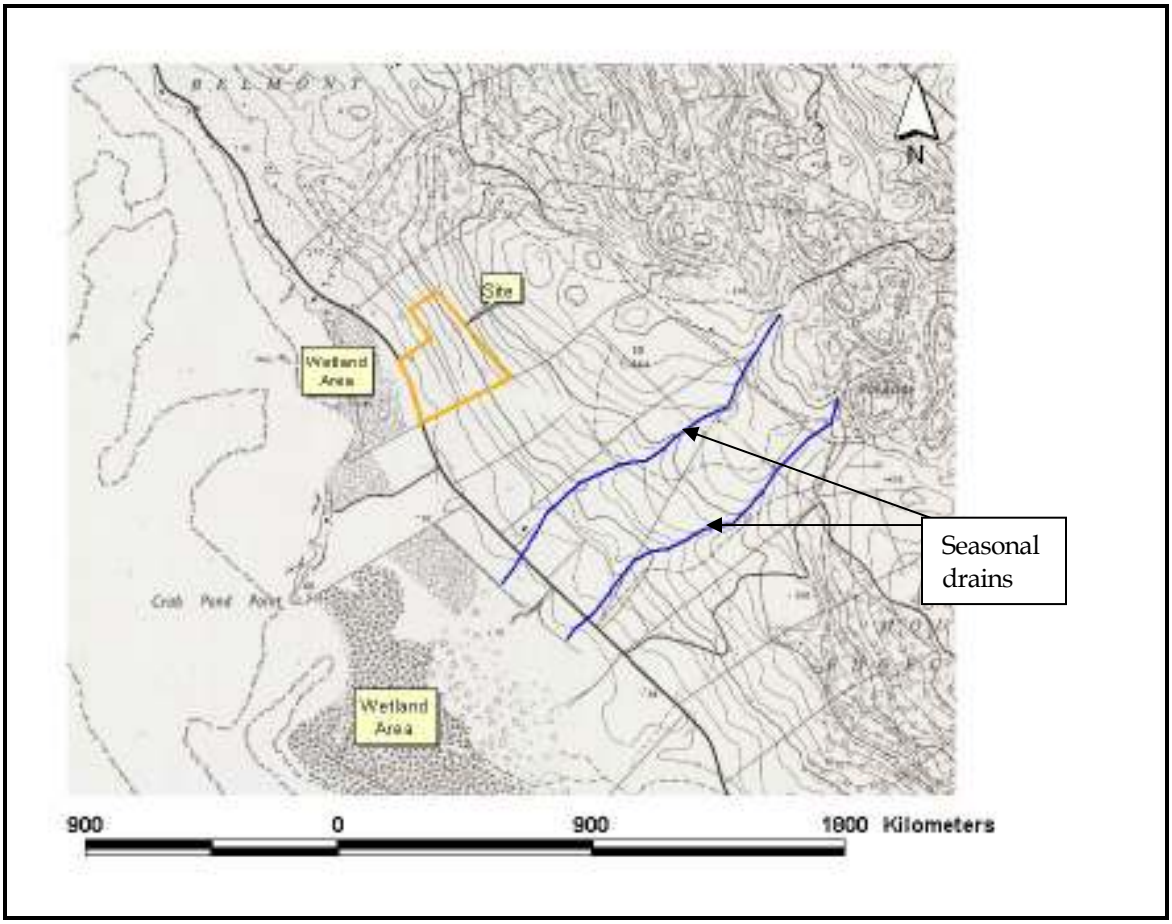
There are no natural drainage features on the site; however there is a small gully located approximately 500 metres south-east of the site. Across from the Belmont to Bluefields main road and about 50 metres south west of the property, is a body of wetland stretching for approximately 270 metres to the Caribbean Sea (Map 6).

Storm Water Runoff Estimation

Storm water run-off for the sub-catchment area is estimated using the Rational Method. This is expressed using the formulae Q =CIA, where:

Q= Peak Run-off in cu ft/sec (m^3 /sec)
I= Rainfall Intensity in inch/hr (mm /hr)
C= Run-off coefficient
A= Area of Catchment in Acres (hectares)

The run-off coefficient (C) was taken from tables developed for the Rational Method. The rainfall intensity (I) was determined for return periods 5, 10, and 25 years obtained from Intensity Duration Frequency Curves developed for the Sangster International Airport in Montego Bay (Brown and Lawrence: Water Resources Authority). This is the nearest rain-gauge station with measured rainfall intensity data. The sub-catchment area (A) was determined from topographic maps of the area using planimetric method. The peak discharge for return periods 5, 10, 25 years is given in Table 4.



Map 6: Showing drainage features (including wetland) near the Belmont project site.
Source: Topographic map (Sheet 34C, 1:12,500)

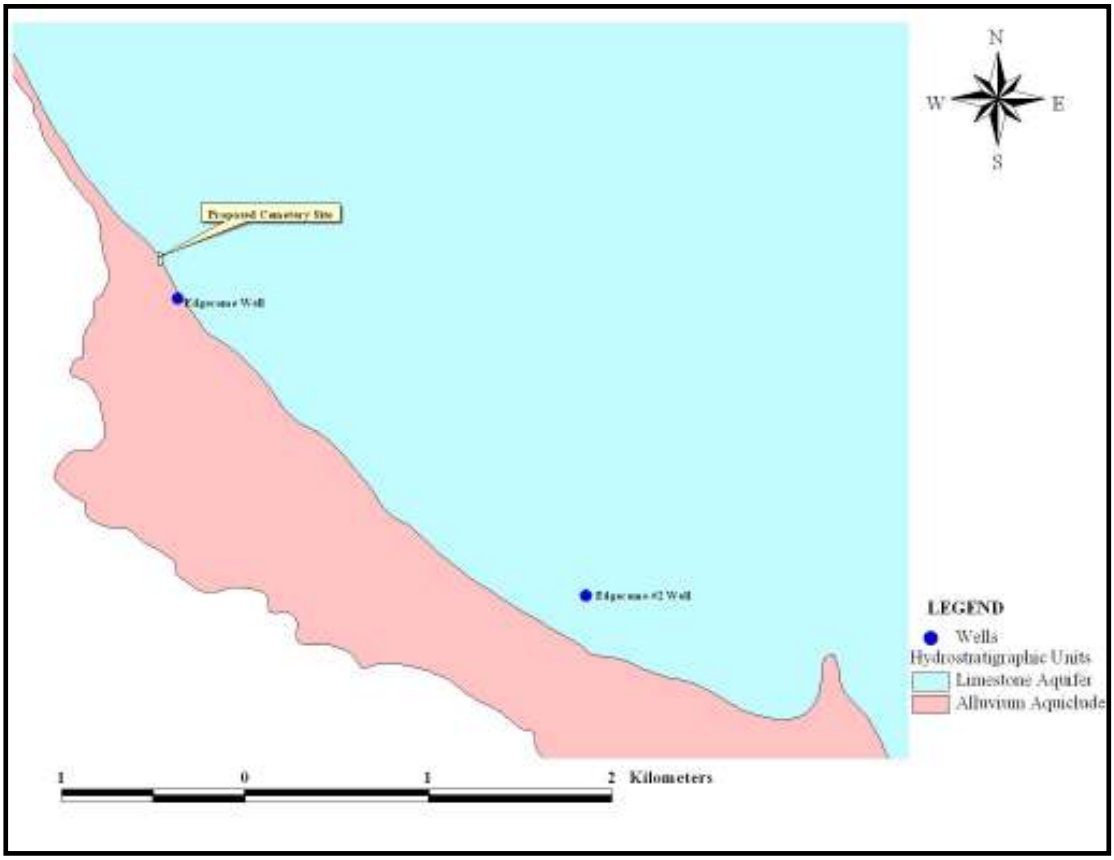
Table 4: Peak surface runoff for return period 5, 10, and 25 years using the Rational Method

RETURN PERIOD (YRS)	5	10	25
Run-off Coefficient	0.38	0.41	0.44
Rainfall Intensity inch/hr	3.32	3.91	4.63
Sub-catchment Area (Acres)	85	85	85
Surface Run-off (cu ft/sec)	107.24	136.26	173.12
Surface Run-off (m^3 /sec)	3.03	3.86	4.9

3.1.6 Hydrology

The proposed cemetery site is located within the Cabarita River hydrologic basin. The area is underlain by the Gibraltar-Bonnygate Formation of the White Limestone Group. The Gibraltar-Bonnygate Formation constitutes the principal aquifer in the vicinity of Belmont and Mt. Edgecombe and is designated a Limestone Aquifer in the island's hydrostratigraphic sequence (Map 7). The designation of a hydrostratigraphic unit as an aquifer is based on

the known or expected capacity of the geologic unit to store and transmit (under the influence of a pressure gradient) significant quantities of water. The dominant water resource type associated with aquifers is groundwater. There are no surface water features on, or in close proximity to the proposed development.



Map 7: Showing major hydrostratigraphic units at the Project Site and surrounding environs.

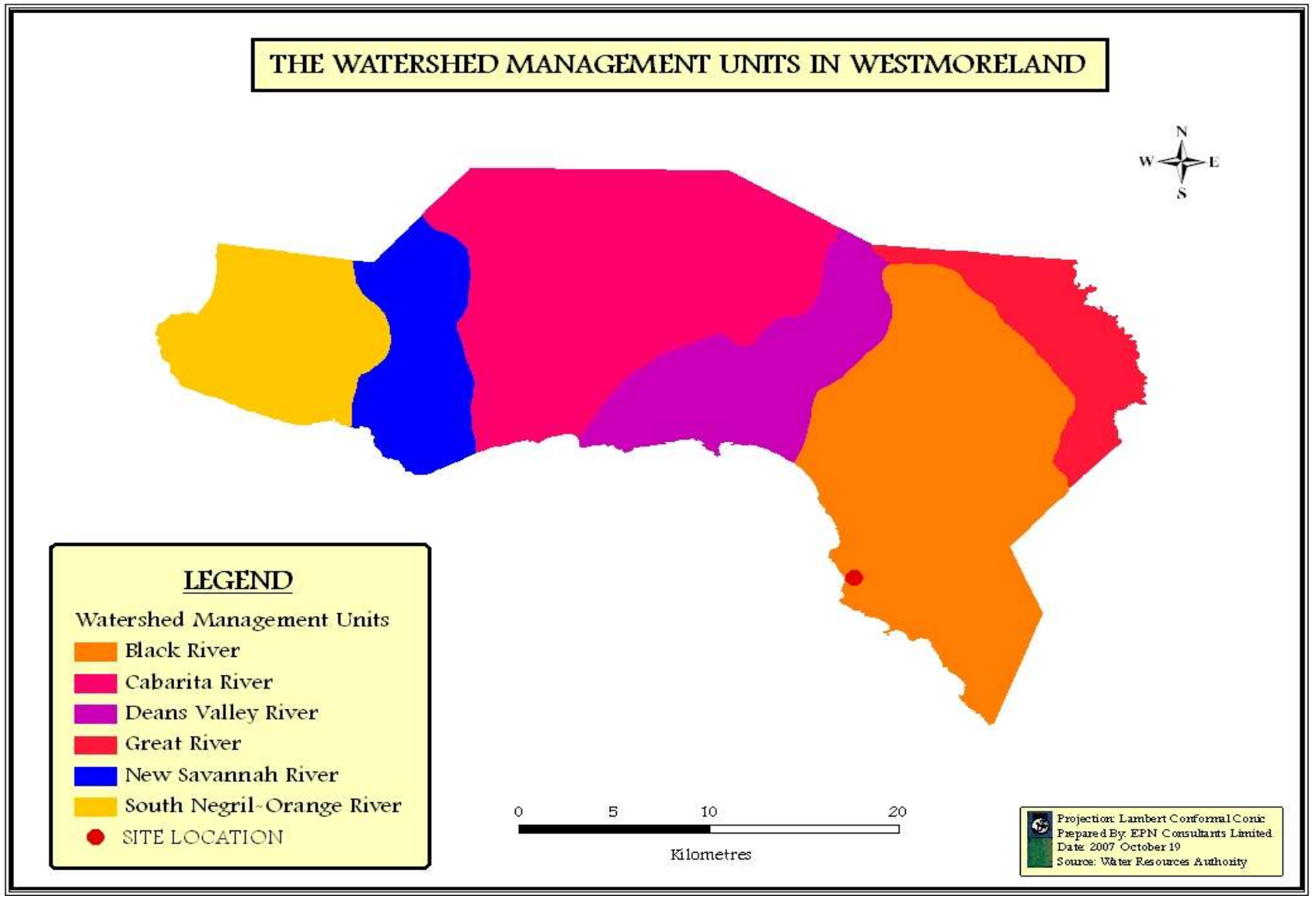
A geological reconnaissance of outcrops showed relatively homogenous, well bedded limestones. The Gibraltar-Bonnygate Formation is a fine grained, soft to moderately hard planktonic micrite, deep water facies limestone. Although a member of the Tertiary White Limestone Group, the Gibraltar-Bonnygate Formation possesses low storage and poor transmissivity characteristics and may also be considered an aquiclude. Karstification within this unit has resulted in the development of fissures, solution channels, sinkholes and caves. However, solution channels are often shallow and poorly developed; there is little interconnection between drainage systems within the subsurface. Field observations made of the Project Site and surrounding environs did not indicate surface karst features.

3.1.6.1 Regional water-table

There is inadequate data for the characterization of the regional groundwater flow system. There are historic, yet discontinuous records of water levels from boreholes and wells in the vicinity of the Project Site. The regional groundwater table largely exists under unconfined conditions in the Limestone Aquifer.

Hydrologic analyses of the nearest wells (Edgecombe and Edgecombe #2) indicate that the groundwater elevation is approximately 5 metres below ground level. These wells (see Palate 9) are located south-east of the Project Site at distances 0.25 km and 2.9 km respectively. The Auchindown well further east indicates that depth to groundwater is 27 metres below ground level. It is anticipated that the response of the water table to rainfall events will vary based on lithologic differences within the Gibraltar-Bonnygate Formation. Water levels are fairly constant throughout the year and do not reflect the seasonality of rainfall. This provides further evidence that surface water does not percolate rapidly to the groundwater table.

Recharge to the Gibraltar-Bonnygate Formation primarily occurs through discrete zones of increased permeability due to faulting. Due to the competent nature of the Gibraltar-Bonnygate Limestone there is a low primary permeability. Solution cavities formed in association with zones of weakness caused by faulting are the dominant flow paths in such karstic aquifer systems. Accordingly, the direction of groundwater flow will largely be determined by the orientation of these geologic faults. As the dominant orientation is north-west to south-east it is deduced that groundwater flows in a south-easterly direction to the sea. The low intrinsic permeability of the regional limestone, minimal occurrence of karstification within the unit and the physical characteristics (type and internal drainage capacity) and the presence of clayey silt of the overlying soil unit do not make the regional water resources highly susceptible to point source pollution.



Map 8: Showing Westmoreland's Watershed Management Units

Plate 8: Abandoned Edgecombe well located 250 metres east of the project site

3.1.6.2 Regional Water Quality

The proposed cemetery is located 250 metres from the Edgecombe well and 2.9 km from the Edgecombe #2 well as shown in Plate 8. Although these wells were commissioned to supply water for irrigation they have now been abandoned due to high concentrations of chloride found in the water (4,000 ppm at the Edgecombe #2 well). Due to their proximity to the coast, it is highly likely that the source of chloride contamination is seawater.

3.1.7 Risk Assessment of Natural Hazards

Natural hazard vulnerability for the area is based on the physical conditions of the site, hazard/susceptibility assessment for the area as well as historical events which have impacted the project site and its environs in the past. While some scientific data on natural hazards is available, this is found to be inadequate in most instances. An assessment of the vulnerability is therefore mainly based on the physical characteristics of the site and surrounding areas and historical events which have impacted the area.

The main natural and geological hazards considered in this section are: inland flooding, coastal flooding (storm surges), earthquakes and landslides.

3.1.7.1 Earthquakes

Seismic data from the Earthquake Unit of the University of the West Indies indicates that for periods between 1997 and 2007, seismic activity occurred within 10 km from the project area. Most of the events have earthquake magnitudes of less than 4 (Figure 5).

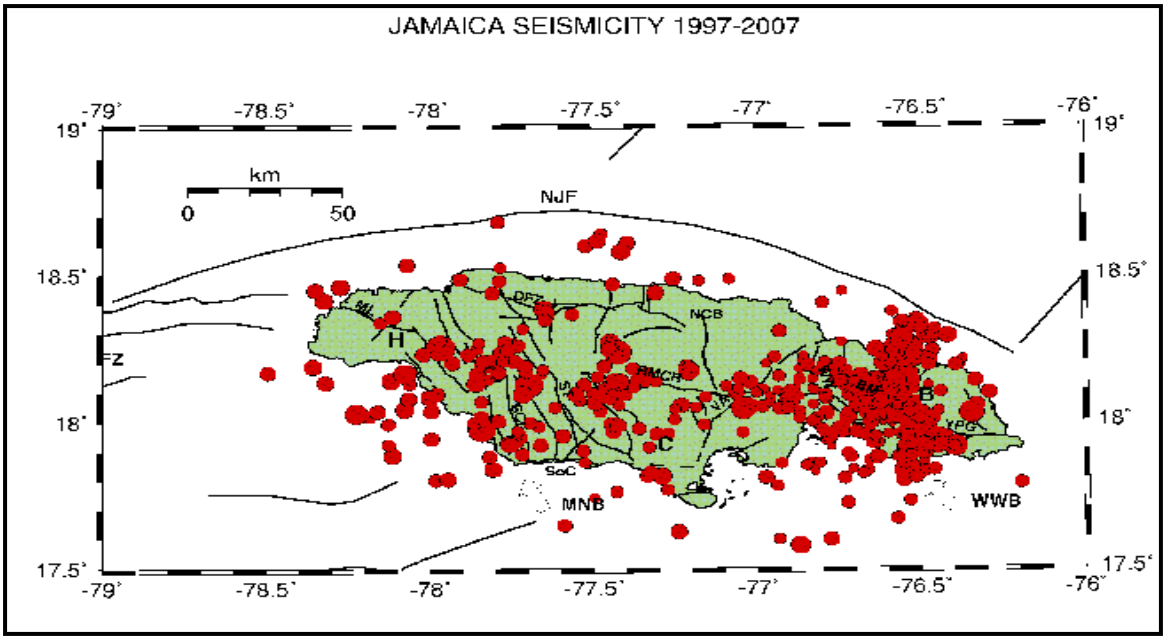


Figure 5: Earthquake of Magnitude less than 4 for the period 1997 – 2007 (Earthquake Unit, UWI)

With respect to significant earthquake events which have occurred in the past, there are a total of three (3) such events which affected western Jamaica over the past 170 years. These events are shown in Table 5. The most significant is the earthquake of March 1957, which caused the death of four (4) persons, destroyed churches, civic centres and damaged infrastructure. The town of Savanna-la-mar in Westmoreland experienced damage to churches and other critical facilities during this event.

Table 5: History of Seismic events-Western Jamaica for the past 170 years

DATE	INTENSITY MMI	LOCATION	DAMAGE
1839	VII	Montego Bay, St. James	Government buildings declared unsafe to be occupied
1943	VII	St. Elizabeth	Landslides, many people homeless
1957	VII	St. James, Westmoreland, Hanover	4 dead, landslides, bridges, churches and civic centre, infrastructures

Source: (Earthquake Unit, UWI)

The area just off the south west coast near the project site show some evidence of seismic activity between 1997 and 2007. However these events are minor, having magnitudes less than 4. Shepherd and Aspinall (1980) conducted

damage frequency survey based on felt earthquakes in Jamaica for periods 1880 – 1960, which showed that the western section of the island had one of the lowest damage frequency rates (< 5 per century).

Shepherd (1999) also conducted earthquake hazard assessment for Jamaica using earthquake peak ground acceleration as the main factor in assessing seismic hazards. For Western Jamaica, including the Belmont property, a horizontal ground acceleration of 0.145g (1.45% of gravitational force) was calculated with a 10% probability of exceedence in 50 years. This implies that source areas for damaging earthquakes are located at great distances away to have any significant impact on the south western section of the property. The potential for a moderate to large earthquake is expected to fall in the low category of hazard vulnerability.

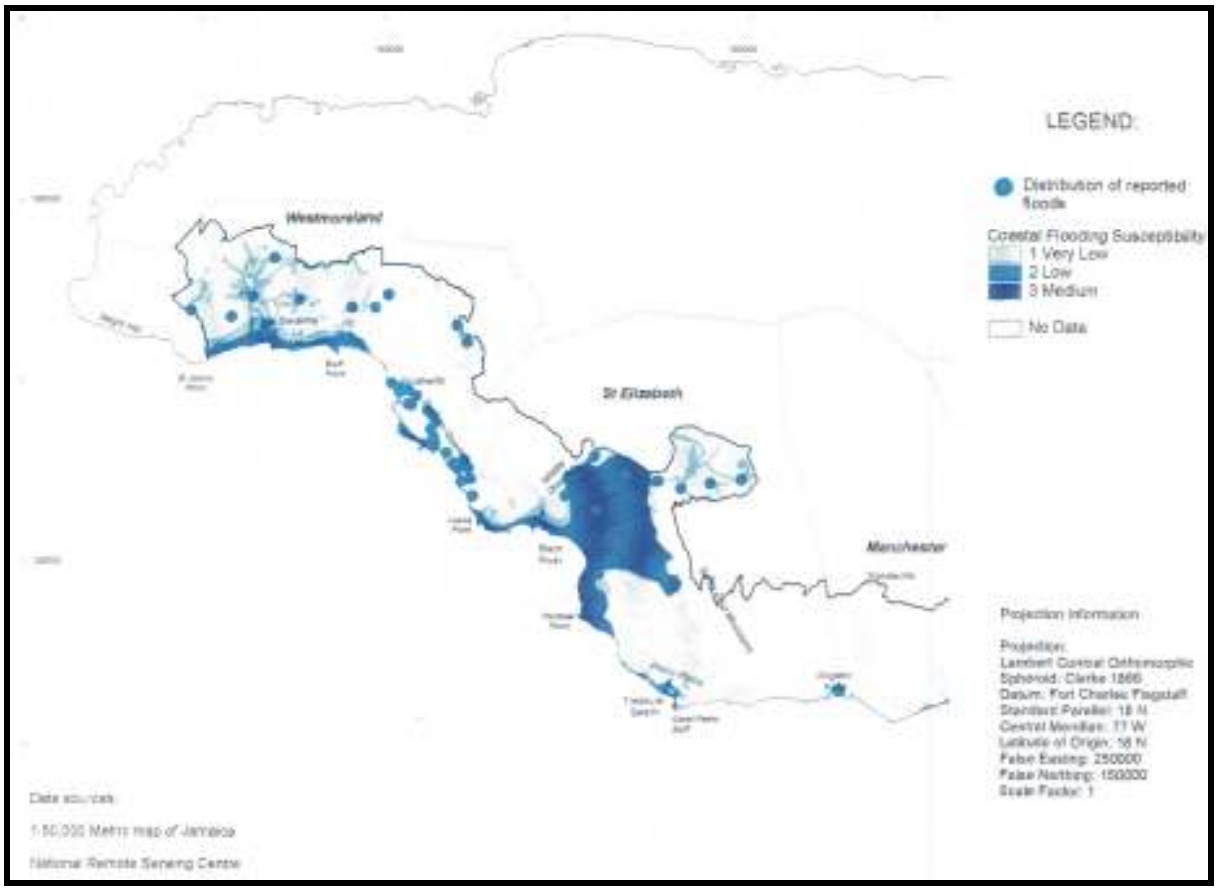
3.1.7.2 Inland Flooding

From a historical perspective, the major flood event which had a negative impact on the Belmont area of Westmoreland is the June 1979 flood rains. Over 600mm of rainfall was recorded within a 24-hour period in the vicinity of the Belmont area, while areas to the north recorded higher rainfall amounts. For the parish of Westmoreland, 300 mm of 24-hour rainfall coincides with a 100-year return period, which suggests that the June 1979 flood rain was an extreme event.

Information from Mines and Geology Division and from Technical Report 4, Halcrow South Coast Development Study, indicates that areas around Bluefields, Cave, Auchindown and Colloden were flooded from overland flows, debris and sheet wash as well as debris flows. This was due to the high degree of saturation of the ground, low infiltration capacity of the underling limestone and high ground water levels.

Existing gullies were deepened and widened and new gullies were formed as a result of rising water levels from the intense rains of June 1979. Large volumes of sediments in the form of debris wash/floods and debris flows were deposited at lower elevations near the coast. On site observation on the Belmont project site shows that there is no evidence of debris fan deposits on site, although elevated flood waters could have possibly affected the area during the event.

An assessment of the Belmont property shows flood susceptibility to be very low, but is surrounded by areas of reported flood events (June 1979 flood rain) and medium susceptibility for areas on the coastal fringes bordering the site which is dominated by marsh and swampland (see Map 9).



Map 9: Flood Hazard Map southern coast of Jamaica showing flood susceptibility in Westmoreland including Belmont area and its environs

3.1.7.3 Storm Surge/Coastal Flooding

The proposed cemetery site at Belmont lies approximately 4.5m at its lowest elevation and an estimated 270m from the coastline. Impact from storm surge is therefore a possibility, particularly for category five (5) hurricanes which can generate sea waves of 5m or more, however, there are no historical accounts of storm surges affecting areas around the project site. The Mines and Geology Division conducted storm surge damage assessment for the south coast following Hurricane Ivan in September 2004 shows that surge heights of up to 1.5m with a run-up distance of 50m was experienced in the Bluefields and Cave areas approximately 1.5km - 2 km north of the Belmont property. This hurricane was classified as a category 4 event which generated surges up to 4m in other areas on the south coast.

Historically, there are accounts of coastal flooding in the town of Savanna-la-mar in 1780 where the town was destroyed by sea surge (Halcrow, South Coast Development Study 1999).

Coral reefs which lie in the near-shore marine environment coupled with the presence of 270m - 300m of wetland, provide two important natural features which offer protection to the Belmont property from hurricane generated sea surges. The lower than expected 1.5m wave height which was consistently estimated along that stretch of the coastline strongly suggests that the offshore reefs helped to break the incoming waves before it entered land, thereby reducing its impact. The potential for sea surge to negatively impact the site is low.

3.1.7.4 Landslides

Rocks and soils are on gentle to moderate slopes. The Gibralter- Bonnygate Limestone is generally a competent and stable rock unless influenced by geological faults and extreme weather conditions. Site inspection of the Belmont property and its environs indicates that the area is generally stable with respect to slope stability. The terra rossa soil on the gentler slope is also stable and the risk of slope failure is low.

3.2 Terrestrial Biology

3.2.1 Vegetation Survey Results

Based on the results of the survey, the vegetation of the proposed development area is severely degraded to the extent that in more than 80% of the site the vegetation is atypical of the coastal dry forest life zone within which it occurs. Moreover, it was obvious that a significant proportion of the site had been clear-cut (see Plate 9) since 2005 – 2006. By all indications the community has, and continues to undergo frequent and severe human modification by way of mechanical clearing, fire, the harvesting of wood, and the grazing of cattle.

As Plate 10 shows, the majority of species identified on the Belmont property could not be classified as trees because either their growth form or maturity did not meet the criterion used for tree classification as such. That is, their diameter at 1.4 meters above ground did not reach or exceed 5cm. Instead, the property was covered primarily by a mixture of ephemeral and perennial shrubs (for example, Caster Oil (*Ricinus communis*) – a common plant of waste places across Jamaica) and grasses, interspersed with seedlings or young trees representative of either the adjoining semi-natural dry forest ecosystem or introduced species that have become naturalized on Jamaica (for example, the Poinciana (*Delonix regia)* native to Madagascar). There was also evidence of the use of both Vetiver Grass, also known as Kus Kus, along with Grow Stake trees (*Giricidia sepium)* for both border demarcation and soil stabilization along the property margins.

The more mature trees of the eastern sections of the property and those that were maintained along the property boundary revealed that the original vegetation was much more diverse. These trees were almost always covered with epiphytic species such as the cactus God Okra (*Hylocereus triangularis*) and species bromeliads of the genius *Tillandsia.*

Plate 9: Showing ongoing clearing of small trees to maintain the site as a savannah. Such clearing has prevented natural succession from returning the site to forest. Photo taken looking east across the property from the north-western corner.
Source: Site Visit

Plate 10: In the foreground is a dense layer of approximately 0.5m in height composed exclusively of herbs and scrubs all common across Jamaica in areas with relatively deep soil and vegetation has been completely removed.
Source: Site Visit

By virtue of the apparent sustained degradation of the site, and its loss of tree cover, overall tree diversity of the site was low. Tree density and diversity were highest at point #5, along the north-eastern fringe of the property where the site graded into semi-natural dry limestone forest and Logwood (*Haematoxylum campechianum*) woodland and along the south-western fringe where a linear border of trees separated the site from the Belmont to Whitehouse roadway. In both of these two tree-dominated areas there was a semi-continuous canopy that varied between 4 – 7 meters. However in the property as a whole there were few areas where there was either extensive or significant canopy cover. On the other hand, the diversity of both woody and herbaceous (soft-tissue) shrubs, and grasses was high. Given the apparent extensive period of clearing, there has been a sufficiently long period of time during which both direct human propagated and naturally dispersed species have had time to colonize.

3.2.1.1 Vegetation along the property boundary

Along its north and eastern borders, the development area is surrounded by degraded dry forest scrub. Immediately beyond Belmont-Whitehouse road that borders the south-western margin of the study area is a wetland ecosystem. The vegetation of this system was dominated by Button mangrove (*Conocarpus erectus*), Black mangrove (*Avicennia germinans*) interspersed with open brackish water in which there was a patchy distribution of emergent herbaceous vegetation in which Wild Cane (*Gynerium sagittatum*) was abundant. This zone extended from the property to the coast. On the northern boundary of the development area was the grounds of the Bluefield All Age School which will be replaced by a high school presently under construction.

3.2.2 Faunal Survey Results

A. Bird species

Forty-three (43) birds belonging to nineteen (19) species were observed during the point count period. Of these, four were Jamaican endemic species while an additional four were Jamaican Endemic sub-species as listed below in Table 6.

Table 6: Jamaican endemic species and sub species observed at the site

	JAMAICAN ENDEMIC SPECIES	JAMAICAN ENDEMIC SUB-SPECIES
1.	Red-billed Streamertail	Caribbean Dove
2.	Jamaican Woodpecker	Vervain Humming Bird
3.	Jamaican Vireo	Jamaican Oriole
4.	Jamaican Euphonia	Greater Antillean Grackle

Source: Bird Survey

Generally, bird species diversity was low. It is also worthy of note that usually it is to be expected that areas, as was the case at the development site, where two distinctly different life zones merge (in this case a wetland/mangrove system and coastal dry limestone forest), species diversity is generally high because of the independent contribution

of the two different ecosystems to the local species pool. However, in the case of Belmont there was only one bird species detected, namely the Magnificent Frigate Bird, which was associated with the Mangrove-woodland and the coastal ecosystem beyond it. As such it appeared that the exchange of species between these two neighbouring habitats was minimal.

Similarly the number and abundance of both Jamaican endemic species and subspecies was low. All the Jamaican endemic species were found away from the more developed (human-degraded) central and north-western sections of the property and most were associated with the more developed woodland in the eastern section of the property.

No bird species identified during the survey is currently considered either to be nationally uncommon or a species of conservation concern (Stattersfield A. J et al. 1998).

B. Butterfly species

Five species of butterflies were identified within the boundaries of the study area (see Table 7). All are regarded as species that are common at lower elevations where they occur across Jamaica. All are usually found in sunny, open spaces or along forest edges with strong sunlight. None of the five species of butterflies are considered to be threatened with endangerment (Brown 1972).

Table 7: Relative abundance of butterfly species observed within the study area

	BUTTERFLY SPECIES	DAFOR Scale of Relative Abundance
1.	Antillean Great White *Ascia monuste eubotea*	Frequent
2.	Sulphur Butterfly *Eurema sp.*	Occasional
3.	Jamaican White Peacock *Anartia jatrophae*	Occasional
4.	Common Tailed Skipper *Urbanus proteus*	Rare
5.	The Cassius Blue *Leptotes cassiusthemus*	Rare

Source: Bird Survey

C. Mammals and Herpetofauna

No wild mammals, reptiles, or amphibians were identified from the study area. This was not surprising given the general lack of surface moisture and its relatively open, degraded state. Domesticated animals were, however, present. Several goats and one cow were observed grazing.

D. Nocturnal Species

No nocturnal species were observed. There was no evidence of the roosting sites (either natural or man-made) for bats within development area. Jamaican bats are found in either caves or man-made structures providing suitable environmental conditions. And while there is a well, there are no known sinkholes or caves. Overall the property appeared to be unsuitable habitat for Jamaican nocturnal birds. There was no evidence of the presence of amphibians and given both the climate and the current degraded state of the site there was a general lack of suitable habitat that might be used by Jamaican amphibian species.

E. Other Species Identified

One additional species identified was the large *Euchroma gigantea* beetle. This beetle is sometimes called the Ceiba Borer because its larvae are miners of the wood of the Cotton Tree (*Ceiba pentandra*) and related species. Accordingly the beetles were identified on a large cotton tree along the Belmont-Whitehouse Road. The beetle belongs to a group known as the Jewel Beetles of which *Euchroma gigantea* is the largest and one of the most strikingly coloured. The species is found throughout Latin America and is not listed as threatened at this time.
(http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1772206)

3.3 Noise Level Results

The results (shown in Table 8) of the noise assessment indicate that the average noise reading on the property is 52.7 dB. This falls below the NEPA standard of 70 dB for outdoor noise level.

Table 8: Noise readings taken at the site at Belmont, Westmoreland

	Noise Readings
	79.3
	60.3
	50.7
	36.8
	36.4
Average	**52.7**

Source: Site Visit, 2008 September 4, 11:00 am

3.4 Socio – Economic Impact Assessment

This SIA model as an effective means of identifying or predicting the probable impacts of a development and recognizes levels of impacts at all stages of the project life cycle – Planning/Policy Development, Construction/Implementation (Phase II), Operation/Maintenance (Phase III) and Abandonment/Decommissioing (Phase IV).

The SIA for the proposed Mount Edgecombe/Belmont Cemetery will seek to understand the behaviour (past, present & future) of the individuals, communities and agencies affected by the development. The social variables assessed are captured within the model (*The Interorganizational Committee, 1994)* described below (see Table 9):

- Population Characteristics
- Community and Institutional Structures
- Political and Social Resources
- Individual and Family Changes
- Community Resources

Population Characteristics – this covers the receptor community's demography, that is, the present population, its structure and composition, population projection, migration pattern and death rate also in the context of the larger geographical unit – the parish of Westmoreland.

Community and Institutional Structures – the report outlines the size, structure, and level of organization of local government including linkages to the larger political systems. The historical and present patterns of employment and the level of diversification of economic activities are described. The size and level of activity of voluntary associations, religious organizations and interests groups where they exist and how they relate to each other are identified.

Political and Social Resources – seek to identify the "power base" or the distribution of power authority, interest groups and the affected public, and the levels of leadership , their capabilities and capacities within the community and region (constituency).

Individual and Family Changes – the SIA seeks to structure the present concerns that could influence the daily life of individuals and families within the receptor communities. These changes range from attitudes toward the project to an alteration in family and friendship networks to perceptions of risk, health, and safety.

Community Resources – Resources include existing land use patterns; the availability of housing and community infrastructure, such as, health, police, fire protection and sanitation facilities. A key to the continuity and survival of human communities are their historical and cultural resources and their potential role in the continuity and survival of the communities.

Table 9: Matrix Relating Project Stage to Social Impact Assessment Variables

Matrix Relating Project Stage to Social Impact Assessment Variables				
Social Impact Assessment Variable	**Planning/Policy Development**	**Implementation/ Construction**	**Operation/ Maintenance**	**Decommissioning/ Abandonment**
Population Characteristics				
Population Change	×	×	×	×
Influx of temporary workers		✓	✓	✓
Community and Institutional Structures				
Interest group activity	✓	✓	✓	✓
Size and structure of local government	×	×	×	×
Historical experience with change	✓	✓	✓	✓
Employment/income characteristics	×	✓	✓	✓
Employment equity of minority groups	×	✓	✓	×
Local/regional/national linkages	✓	✓	✓	✓
Industrial/commercial diversity	×	×	✓	×
Presence of planning and zoning activity	✓	×	×	×
Political and Social Resources				
Distribution of power and authority	✓	✓	×	×
Identifications of stakeholders	✓	✓	✓	✓
Interested and affected publics	✓	✓	✓	✓
Leadership capability and characteristics	✓	✓	✓	✓
Individual and Family Changes				
Perceptions of risk, health, and safety	✓	✓	✓	✓
Trust in political and social institutions	✓	✓	✓	✓
Residential stability	✓	✓	✓	×
Density of acquaintanceship	✓	×	×	✓
Attitudes toward policy/project	✓	✓	✓	×
Family and friendship networks	✓	✓	×	×
Concerns about social well-being	✓	✓	✓	✓
Community Resources				
Change in community infrastructure	✓	✓	✓	✓
Land use patterns	✓	✓	✓	✓
Effects on cultural, historical, and archaeological resources	×	×	✓	×

3.4.1 Summary of Areas of Social Significance

The socio-economic, physical planning and spatial implications of the proposed cemetery are extensive within the context of Western Jamaica. The genesis of the proposed project is the projected demand for burial plots primarily within Westmoreland and adjacent parishes. This project is also geared towards meeting the projected long-term demand for the region and nationally.

The sustainable development of the proposed site is measured within the context of the carrying capacity of the receiving environment, specifically, the socio-demographic and political –economic components based on their relevance in the SIA process. On the other hand, the physical-ecological component is addressed elsewhere in the EIA report.

The following are the primary issues relating to the development:

- The effects of the development of a new cemetery serving Westmoreland
- The implications for social services and amenities, physical infrastructure, employment and harmony
- The effects of the development on existing and adjacent populations and economic activities
- Limitations and advantages of the physical environment
- Its effects on the general growth and character of the area

Ultimately, the success of the development could be measured in terms of its sustainability. The project would have obtained objectives of sustainability if:

- Locals are given priority for jobs created
- Public and Occupational Health and Safety are assured
- There is improvement to the quality of the physical, economic, social and cultural environment
- The development considers the area's uniqueness in terms of population, climate, geography, history and culture
- Conservation measures are implemented that help reduce the use of energy and natural resources
- There is a participatory attitude in the planning of the project

3.4.2 Demographics

A. Population

The preliminary census data for 2001 revealed that the parish of Westmoreland had a total population of 138,947 while the population of Savanna–la–mar stood at 19, 893 and was approximately 14.32 per cent of Westmoreland's total population. Data obtained from STATIN revealed that the estimated population for Westmoreland at the end of 2005 was 143,042; this was 5.4% of the island's population (2,660,723). The information also revealed that Westmoreland had a steady growth in population (see Table 10).

Table 10: Population change in Jamaica and Westmoreland (2001 – 2005)

	2001	2002	2003	2004	2005
Jamaica	2,607,633	2,621,456	2,635,647	2,648,224	2,660,723
Westmoreland	138,947	140, 192	141,205	142,127	143,042
% of National Population	5.33	5.34	5.4	5.4	5.4

Source: STATIN

The 2001 census figures revealed a positive growth rate at both the parish and town levels from during the ten year period. In 1991 the parish figure stood at 128,361 while the population figure for Savanna-la-mar was 16, 629 (see Table 11 below). By the year 2005 the population of Westmoreland had increased to 143,042.

For the period 1991 to 2001 the national annual growth rate was 0.91 per cent while that for the parish of Westmoreland was 0.80 per cent, with the parish's urban population (Savanna-la-mar, Grange Hill and Negril and Whitehouse) growing at an average rate of 1.5 per cent (almost twice the national growth rate) .

Table 11: Comparative population change within Westmoreland (1991 – 2001)

Location	1991	2001	Annual Rate Of Growth (%)
Jamaica	2,380,667	2,607,631	0.91
Westmoreland	128,364	138,947	0.80
Savanna-la-mar	16,629	19,893	1.6
Grange Hill	6,777	7,591	1.1
Negril	4,258	5,854	2.7
Whitehouse	3,157	3,498	0.97

Source: STATIN, 2003

Data on the population structure in Westmoreland indicate that in 1991 55.66% of the population fell in the age group 15 – 64 years, 35.07% of the population was under 15 years and persons 65 years and older only accounted for 9.27% of the population. Data for 2001 (see Map 10) indicate that the population had experienced a slight change in its structure over the ten year period as persons in the 15-64 age group accounted for 57.93% (increase) of the population, 33.30% (decrease) of the population fell in the under 15 age group and 8.76% (decrease) of the population were 65 years and older.

Table 12: Population within the Enumeration Districts

2001			
ED	POPULATION		
	Total	Male	Female
EO75	207	104	103
E076	821	398	423
E077	721	378	343
E078	438	226	212
E079	311	181	130
Total	**2498**	**1287**	**2080**

Relevant population change summarized for the period 1991 to 2001 are shown below:

- the annual rate of Jamaica was 0.91%
- the annual rate of growth for Westmoreland was 0.80%
- the annual rate of growth for Savanna-la-mar was 1.6%

B. Population Density

The significant disparity in rural and urban populations in the parish of Westmoreland may be influenced by tourism in the parish. The population density in Westmoreland for 2001 was 172 persons per square kilometer (see Map 11). Urban areas, such as, Savanna-la-mar (the capital) and Negril are expected to experience the highest population

densities in the parish. Population density within the SIA area is equally influenced by topography and local economic activity.

C. Population Projection

If it is assumed that the annual growth rate of approximately 1.6% for the period 1999 – 2001 in Savanna-la-mar remains constant, it is projected that the population will reach approximately 22,859 and 24,688 in the years 2010 and 2015 respectively. Likewise, if the annual growth rate of 0.80% for the period 1991– 2001 is maintained for Westmoreland, it is projected that the population will reach approximately 150,194 in the year 2010 and 156,201 in 2015 (see Table 13).

Table 13: Population Projection for Westmoreland and Savanna-la-mar (2001-2015)

Parish/Capital	2001	2005	2010	2015	Growth Rate %
Westmoreland	138,947	143,042	150,194	156,201	0.80
Savanna-la-mar	19,893	21,166	22,859	24,688	1.60

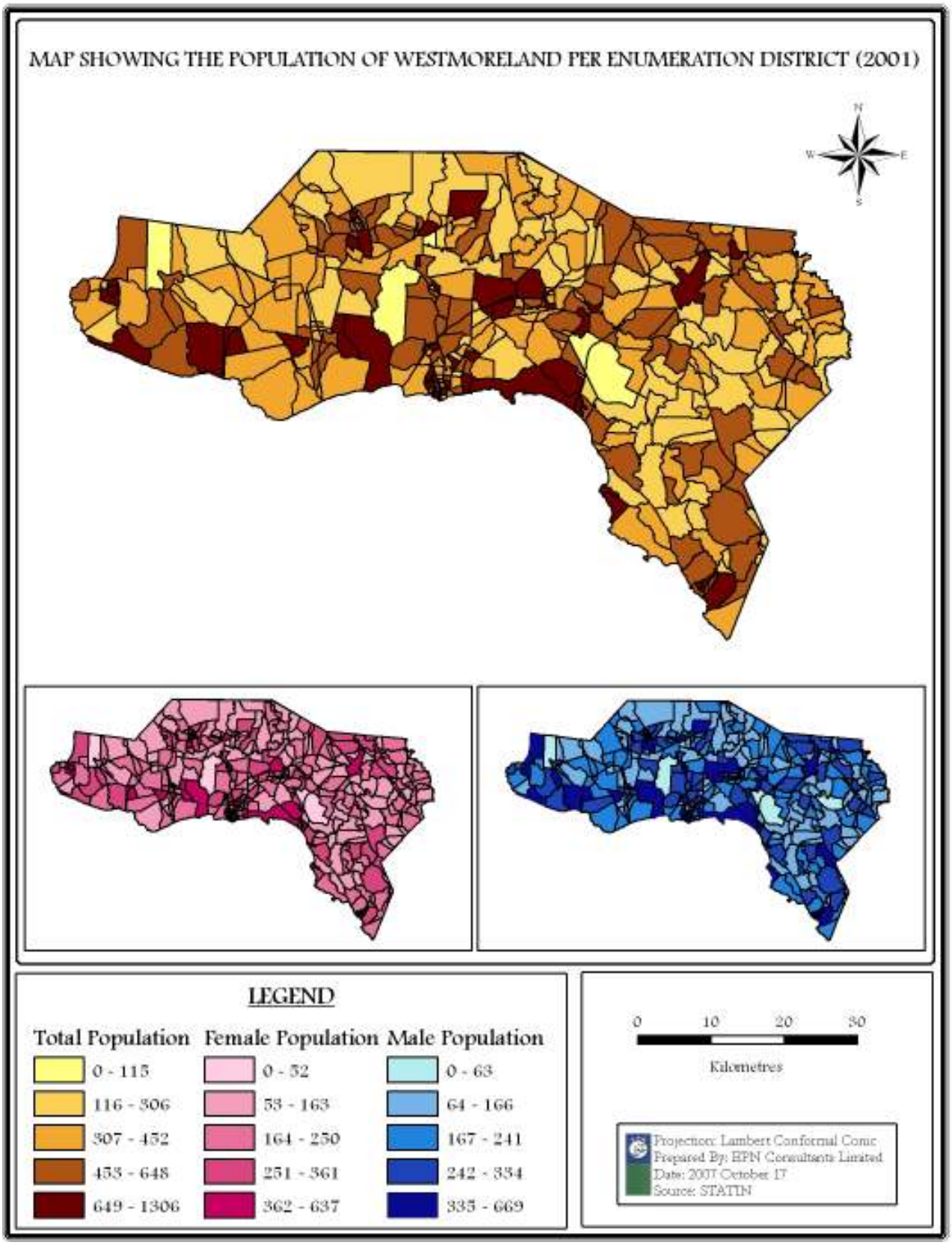
3.4.3 Hierarchy of Urban Centres

Urban centres are classified as regional centres, parish capitals, main towns and other towns. Savanna-la-mar, the administrative capital, is the predominant town in Westmoreland followed by Grange Hill (7,591) and Negril (5,854) (STATIN, 2003). Other towns in the parish include Sheffield, Little London, Petersfield and Wakefield. A towns' hierarchy is the product of factors, such as, the level of economic development in the area and the population size.

3.4.4 Migration

Growth within the tourism sector (in areas, such as, Montego Bay, St. James and Negril, Westmoreland) is one of the main pull factors affecting internal migration patterns throughout the Island. From 1991 – 2001 the town of Negril grew by 37.5% or by 1,600 persons (STATIN, 2003).

During the period 1991 & 2001, 8,592 persons migrated from Westmoreland to other parishes, most migrated to St. James (2,093) and St. Andrew (1,683). In comparison, during this same period, an estimated 7,584 person migrated to Westmoreland resulting in a net migration of 1,008 into the parish.



Map 10: Showing the population of Westmoreland, 2001

3.4.5 Mortality rate

Jamaica's life expectancy at birth stood at 71.2 years, while crude birth rate stood at 17.03 per 1000 of the population (STATIN, 2007). In 2007 crude death rate stood at 6.37 per 1000 of the population, an increase of only 0.24per 1000 of the population when compared to figures for 2006 (see Table 14).

Table 14: Population, Rate of Increase, Births and Deaths Rates for Jamaica, 2000-2004

YEAR	END OF YEAR POPULATION	MEAN POPULATION	ANNUAL RATE OF GROWTH (%)	CRUDE RATE OF NATURAL INCREASE	CRUDE BIRTH RATE	CRUDE DEATH RATE
2004	2,644,100	2,638,100	0.48	11.5	17.6	6.41
2005	2,656,700	2,650,400	0.46	11.2	17.86	6.62
2006	2,669,500	2,663,100	0.48	11.2	17.82	6.13
2007	2,682,100	2,675,800	0.47	10.7	17.03	6.37

Source: Ministry of Health, STATIN, PIOJ

3.4.5.1 Leading causes of death

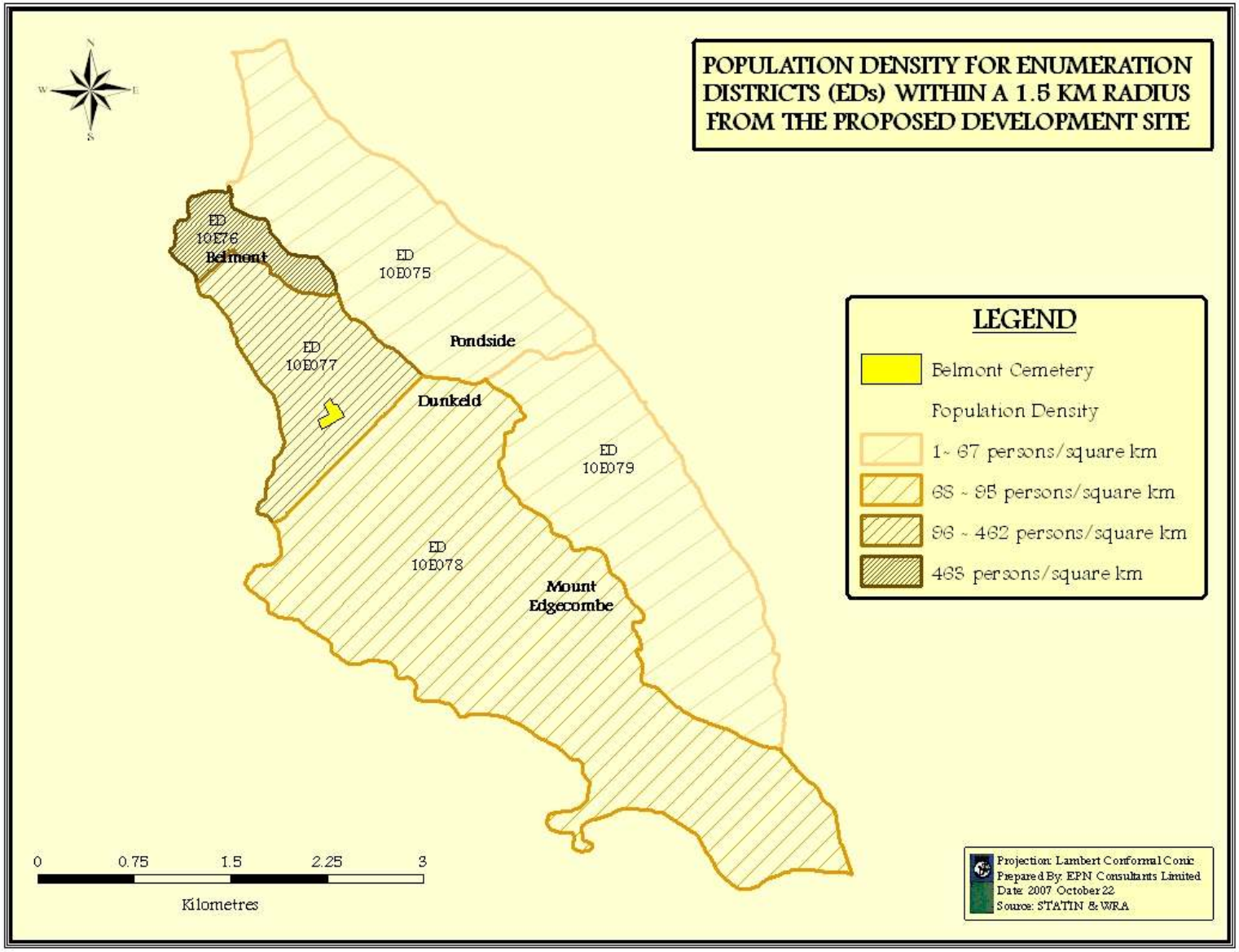
In Jamaica in 2002, the leading causes of death (ranked by deaths per 100,000 of the population) were cerebrovascular disease, heart disease, diabetes and homicides. Women were more disposed to die by cerebrovascular disease and diabetes while men were at a significantly higher risk from heart disease and homicides.

Other than the traditional diseases, the worldwide HIV/AIDS pandemic and violence presently has a negative impact on the island's death rate. According to Global Health Reporting approximately 25,000 persons were living with HIV/AIDS in Jamaica at the end of June 2005 with an estimated 1,300 deaths due to AIDS.

3.4.6 Community and Institutional Structure

The parish of Westmoreland is divided into three (3) constituencies: central Westmoreland, Eastern Westmoreland and western Westmoreland. The proposed cemetery falls in the eastern Westmoreland constituency. Luther Buchanan is the Member of Parliament for the constituency. Mr. Valdence Tifford is the parish councilor for the Whitehouse division of the parish under which Belmont falls.

The Westmoreland Parish Council, the project proponent, is the local planning authority and has responsibility for the provision, management and regulation of certain public services including public health services, fire protection, abattoirs and cemeteries.



Map 11: Showing population density within the development area.

3.4.6.2 Employment and income

The total number of unemployed persons in Westmoreland in 2003 was 11,200 as shown in Table 15 below, while the national unemployment figure was 170,200 in the year 2002. By April 2006, however, national unemployment figures had declined by 4.4%. Recent figures for the parish of Westmoreland are, however, unavailable.

Table 15: Annual average labour force employed and unemployed in Westmoreland and Jamaica

LOCATION	TOTAL	EMPLOYED	UNEMPLOYED	UNEMPLOYED (%)
Westmoreland (2003)	62,600	51,400	11,200	17.9
Jamaica (2002)	1,124,500	954,300	170,200	15.1
Jamaica (October 2007)	1,268,800	1,149,000	119,800	9.4

Source: STATIN & PIOJ

The parish of Westmoreland had a high dependency ratio of 83:100 in the year 2002 (PIOJ and STATIN, 2005) this was 11 per cent higher than the national age dependency ratio of 71.8 per cent. Approximately 45% of the parish's population were in the non-economically active age group (35% were 0-14 years and 10% were over the age of 65) while 55% of the population comprised the economically active age group (15-64 years). This data suggests that while the economically active age group is 10% more than the non-economically active age group, dependency is high possibly because of a high unemployment rate.

Residents in the social impact area are employed in a wide range of occupations including fishers, fish vendor, housekeepers, barbers, dressmakers, construction workers, painters, masons and waitresses. As it relates to salary, 46% or the majority of the respondents receive less than Twenty Thousand Dollars ($20,000.00) per month (see Figure 6).

3.4.6.3 Economic activities

The dominant economic activities in Westmoreland are agriculture, tourism and the distributive trade (PIOJ & STATIN, 2005).

Changing fortunes within these sectors have been influenced by both national and global trends. Owing to the unavailability of sufficient data for the region, the national and Parish data will be applied where necessary.

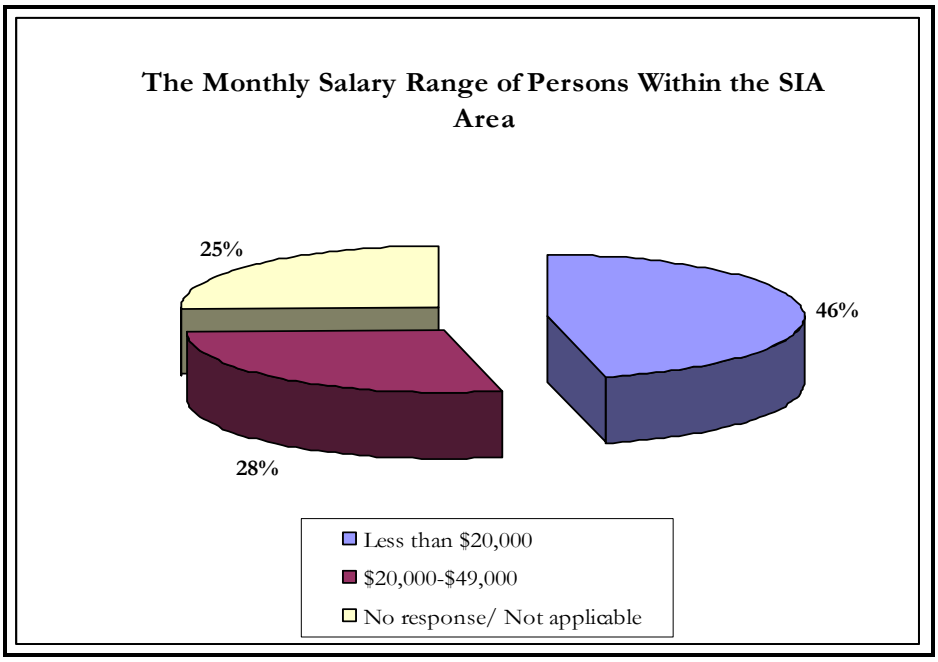


Figure 6: monthly salary ranges of residents in the SIA area

A. Agriculture

Westmoreland continues to be one of the leading parishes in domestic food crop production, joining St. Catherine, Manchester and St. Elizabeth as the top four, each producing well over 50,000 tons of food crops for the local and overseas markets[1] (Jamaica Gleaner, 2002)

During 2001, Westmoreland recorded a marginal growth of 1.60 per cent in food crop production over the previous year. The actual figures stood at 51,249 tons in 2000 as against 52,247 tons in 2001. This amounts to a significant 19.60 per cent of the island's total production for the period.

With regards to livestock, cattle farmers in the parish continue to experience the effects of what is generally accepted as a sluggish market. There has been a decline of the traditional agrarian industries of sugar and cattle over the years. This decline has been largely due to a shift in the local and macro economy from natural resource based industries to the more human resource based one such as tourism and financial services. The parish also produces diverse agricultural products such as sugar cane, cocoa, coconut, coffee, citrus and pimento. The fishing industry in Westmoreland currently ranks second in the island.

B. Tourism

Tourism has far surpassed the manufacturing and agricultural activities in Jamaica with Negril, Westmoreland being one of the main tourist destinations generally and on the south coast specifically.

[1] Saturday 2002, May 4

Some of the major hotels include Sandals Negril, Poinciana Beach Resort, Grand Lido, Hedonism and the most recently built Sandals Whitehouse.

C. Manufacturing

Manufacturing is an important economic activity in Westmoreland. Manufactured items include food and drink, animal feeds, textiles and textile products and tobacco.

3.4.6.4 Religion

As with most (rural) communities, churches play an integral role within the community providing a means of socializing and dissemination of information. According to the 2001 Census there are three main religious denominations based on the number of affiliates. First was the Seventh Day Adventist with 281, 353 members, second was the Pentecostal denomination with approximately 247,452 members and third was the Church of God with 215,837. The Belmont Missionary Church is one of the churches located in the SIA area (see Plate 11).

Plate 11: The Belmont Missionary Church

3.4.7 Individual and Family Change

3.4.7.1 Health and Safety Considerations

The concept of Health and Safety in the context of this report is rooted in the discipline of risk analysis which treats with the detection of potential causes for accidents and the evaluation of their probability and the extent to which they could cause damage, requiring that global risks be brought to an acceptable level. Bearing this in mind, it is any attendant risks associated with the project that are of relevance and these are referred to specifically as social risks.

These social risks include the social consequences of accidents and unsatisfactory working and living conditions. Also included are the perceived or potential risks of exposure to conditions (hazards) that may produce acute and chronic effects on the safety and health of existing and proposed residents, visitors, employees and mourners.

Main Impact Groups

- Employees – during all phases and stages of development.
- Visitors/Mourners – using the facility for burial ceremonies and visits to gravesides
- Population – potential risks to potable water supply

Management of Potential Risks

- Pollution - soil, underground water & sources of potable water supply, safe disposal of solid waste & medical waste etc.
- Implementation of a Traffic Management Plan to allow for emergency exits, proper signage, safe access/egress of visitors and mourners.
- Emergency Response – Development of an Emergency Response Plan (ERP)
- Disaster Management Plan - Awareness of the Parish Disaster Management Plan
- Development of an Occupational Health and Safety Management Plan which includes job safety analysis for each type of job.
- Implementation of mitigation measures during Phases II and III of the development to reduce potential impacts.

3.4.8 Community Resources

3.4.8.1 Existing Land Use

This development falls under the Town and Country Planning Act of 1958 (amended 1993 and 1999) and the Local Improvements Act of 1944. The guidelines of the Westmoreland Parish Confirmed Development Order (1982)

A. On Site

The land at the site is relatively flat to gently sloping and vegetation on the site is mainly shrubs, and grassland with a few trees (cotton, pimento, naseberry). The baseline data for biological resources revealed that fauna present on site includes butterflies and goats.

B. Surrounding land use

Properties located to the north, south and east of the site show similar land use characteristics to that of the proposed development site. South of the property and the main road) and east of the site are open lots with similar land use of pasture. Immediately west of the site is the Bluefields All – Age School which is being upgraded to a high school.

C. Coastal Zone Activities and Land Use

The coastal zone boundary for the proposed development extends from Crab Pond Point south-south-west of the development site to Belmont Point located north-north-east of the site. The land use along the coastal line (see Map 12) is that of mixed use (residential, commercial, educational/institutional, recreational) (see Plates 12 – 16), pasture and mangrove.

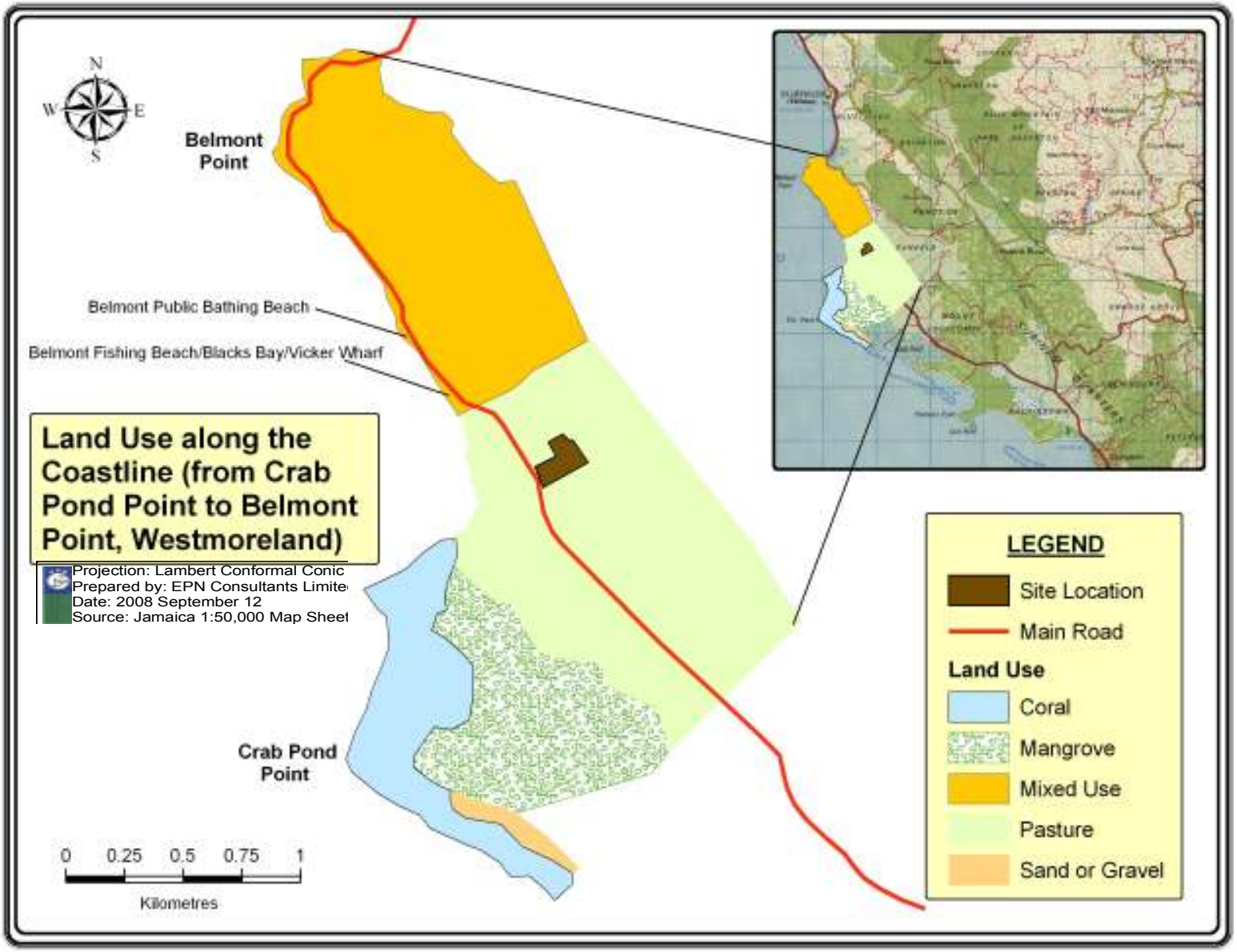
Of major importance on the coastline are the Belmont Fishing Beach (Plate 11) usually referred to as Blacks Bay/Vicker Wharf by the local residents and the Belmont Public Bathing Beach (see Plate 13). The fishing beach currently provides livelihood for approximately thirty (30) fishermen in the area. Fishermen indicated that their catches include fishes such as king, yellow and red tail, snapper and shell fish. The bathing beach is usually buzzing with visitors mainly on public holidays and also acts as a fishing beach.

D. Housing

The 1991 Population Census revealed a total of 34,287 households in Westmoreland. There were 33,604 dwellings and a population of approximately 16,629 persons in Savanna-la-mar. The average number of persons per dwelling was two (2) persons. In 2001, however, the population increased to 19,893 and the number of dwelling units increased to 41,319 resulting in an average of 2.1 persons per dwelling. This is significantly below the national average of approximately four (4) persons per dwelling unit.

The outer walls of the houses built in the parish of Westmoreland are built of four main types of materials; (i) wood (25,002), (ii) concrete and blocks (9,708), (iii) wood and concrete (4,263), and (iv) nog (215). The roofing materials are predominantly; (i) metal sheeting (36,287), (ii) concrete (1,831) and (iii) wooden shingle (410).

Within the Enumeration Districts surveyed there are 699 households. Of the 70 households interviewed 93% owned their homes.



Map 12: Land use surrounding the site for the proposed cemetery

Plate 12: A section of the Belmont Beach/Blacks Bay/Vickers Wharf – used mainly for fishing activities

Plate 13: A restaurant located adjacent to the plaza shown in plate x below.

Plate 14: Commercial: a plaza located within the coastal zone

Plate 15: A section of the Belmont Beach/Blacks Bay/Vickers Wharf – used mainly for Public Bathing as well as fishing.

Plate 16: A hotel on the coast

3.4.5 Social Services and Amenities Infrastructure

Within the framework for a totally integrated development the promotion of a harmonious integration of all sectors such as the physical, social, cultural, economical, environmental and governance systems are integral to the objective of achieving comprehensive sustainable development and must be embodied in the process from its outset. In this context, the various social services are discussed below.

Police - The Bluefields Police Station is located approximately 1½ miles from the proposed development site in Mount Edgecombe/Belmont; as such this station would serve the development area. The station, however, has been located (see Plates 17 and 18).

Post Office -Based on information obtained from the Post Mistress at the Bluefields Post Office (located approximately 1 ½ miles from the proposed development area) (see Plate 19 below), the post office offers) the basic services of general mail delivery, receiving mail and the selling of stamps. The Post Office currently serves the communities of Bluefields, Belmont, Ncalpine, Aldere, Brighton and Mount Aire. The communities served must make visits to the post office to access their mail through the General Delivery section or through rented private letter boxes.

The Postmistress noted that there is currently no land line telephone service which has hindered the implementation of a bill payment service.

Plate 17: The old Bluefields Police Station

Plate 18: The (new) Bluefields Police Station relocated to a home

The post office has a staff complement of 2 personnel; the Post Mistress and an assistant. The opening hours are Mondays to Fridays from 8:00 am to 5:00 pm.

Plate 19: The Bluefields Post Office

Schools - Few schools are in close proximity to the proposed development area, hence only the most accessible public school facilities are listed in Table 16 below. According to data from the Ministry of Education for the period 2006 – 2007 of the two infant schools (that cater to the age cohorts 3-6 years) in the parish; St. John's Infant, is in closer

proximity to Belmont community and has a population of 51 students which is below the school's capacity of 100 students.

As it relates to primary schools (age cohort 6 – 11) in the SIA area, there is the Kings Primary in Whitehouse that suffers from overcrowding as for the period 2006-2007 a student enrolment of 273 and student: teacher ratio of 46: 1, which was above the Ministry of Education standard for student: teacher ratio of 42:1.

All-Age schools (age cohort 12-15) within the SIA area are the Bluefields All-Age, Belmont, Mount Airy All-Age, Mount Airy and the Mearnsville All-Age, Cave. The Bluefields All-Age that is being upgraded to a high school (see Plates 20 and 21) is located immediately adjacent to the proposed development site. There is no overcrowding in the other schools as shown in Table 16 below.

Plate 20: The Bluefields All-Age School and the new high school under construction

Plate 21: The new high school being constructed adjacent to the Bluefields All – Age School

There are three (3) high schools (age cohort 12-18) within the vicinity of the Proposed Action; they are Godfrey Stewart High, Savanna-la-mar; Manning's High, Savanna-la-mar and Maud McLeod High, Darliston. Overcrowding appears to be an issue at all three schools (see Table 16). The student: teacher at the Godfrey Stewart High School falls outside the recommended ratio of 25:1.

Table 16: Public Schools in the Belmont SIA Area 2006 - 2007

LEVEL	CAPACITY	ENROLMENT	NO. OF TEACHERS	PUPIL/ TEACHER RATIO
Infant				
Savanna-la-mar	270	464	17	31:1
St. John's	100	51	3	26:1
Primary				
Ferris	180	273	9	46:1
Kings	235	236	7	39:1
All Age				
Bluefields	230	92	4	31:1
Mount Airy	230	625	18	37:1
Mearnsville	220	242	9	35:1
Primary & Junior High				
Kentucky	120	137	6	27:1
Secondary High				
Godfrey Stewart	1,200	1,755	64	31:1
Manning's High	1,600	1,931	104	21:1
Maud McLeod	800	1,232	59	23:1

Source: Ministry of Education

Health Services - The Western Regional Health Authority (WRHA) within which Westmoreland falls, has responsibility for public health surveillance and enforcement, and delivery of healthcare to the estimated 454,176 inhabitants of the parishes of Westmoreland, Trelawny, St. James and Hanover (see Table 17); a population that is growing at an average rate of 0.62%.

Table 17: Western Health Region – Urban and Rural Population (2001)

	WESTERN REGION	WESTMORELAND	TRELAWNY	ST. JAMES	HANOVER
TOTAL	454,176	138,947	73,066	175, 126	67,037
URBAN	152,714	35,690	14,290	96,488	6,246
RURAL	301,464	103,257	58,776	78,640	60,791

Source: STATIN

i. Health Centres

There are 20 operational Health Centres ranging from Types I to IV, located throughout the parish of Westmoreland as shown in Table 18 below. The parish is divided into five (5) Health Districts (White House, Darliston, Grange Hill, Negril and Savanna-la-mar) within which the Health Centres falls. There is at least one Type III Health Centre located in each Health District except for the Savanna-la-mar Health District which has a Type IV Health Centre.

Table 18: Name and Type of Health Centres in Westmoreland

NAME OF HEALTH CENTRES	TYPE
Bluefields, Beeston Spring, New Works, Cornwall Mountain, Burkshire, St. Leonards, Baulk, Georges Plain, Jerusalem Mountain, Delveland, Williamsfield	**I**
Petersfield, Little London, Lambs River	**II**
White House, Darliston, Grange Hill, Negril	**III**
Savanna-la-mar	**IV**

Source: Westmoreland Department

The Type I Bluefields Health Centre is located in the closest proximity to the proposed development site. The staff compliment includes one (1) Doctor, Staff Nurse, Dentist, Dental Assistant, Dental Nurse, Midwife, Public Health Aid and Public Health Inspector and four (4) Community Health Aids. Other staff members include two (2) Orderlies, a cashier and record staff.

The Savanna-la-mar Health Centre is the only Type IV Health Centre in the parish of Westmoreland and as such it serves the entire parish. The Centre provides in-patient and out-patient services as follows: Child Health, Pre-natal Health, Child Guidance Counseling, Sexually Transmitted Infection Service, Public Health (food handling etc.), Curative, Medical, Dental, Family Planning, and Dressing.

The Health Centre offers clinical services and all services of the Parish Health Department, for example, food handlers' permits.

ii. Hospitals

Hospital services are provided through general and specialist facilities. These are administered through the boards of the four (4) Regional Health Authorities. Hospitals are classified A, B or C (Table 19) according to the level of service and the size of the population served (Ministry of Health).

Table 19: Hospitals in the WRHA by Type and Bed Complement

WESTERN	HOSPITAL	ADDRESS	TYPE	NO. OF BEDS
Westmoreland	Savanna-la-mar Hospital	Barracks Road	B Public	150
Trelawny	Falmouth Hospital	Rodney Street	C Public	102
St. James	Cornwall Regional Hospital Doctor's Hospital	Mount Salem Fairfield	A Public Specialist Private	52 10
Hanover	Noel Holmes Hospital	Fort Charlotte Drive	C Public	55

Source: Ministry of Health

The only public hospital in the parish of Westmoreland is the Savanna-la-mar Hospital. This is a basic Type B hospital which offers services in in-patient and out-patient services in the four basic specialties; general surgery, internal medicine, obstetrics and gynaecology and paediatrics.

The Royale Medical Centre, a private hospital, is also located in Savanna-la-mar.

Fire Service - Based on the location of the proposed development, the Savanna-la-mar Fire Station would serve the proposed development. This station serves the entire parish of Westmoreland except for the Negril area which is served by the Negril Fire Station. The Savanna-la-mar Fire Station is equipped with two (2) fire engines and one (1) ambulance. Personal communication with a fire fighter at the station revealed that all three vehicles are functioning properly (the sirens are functional and the fire engine can access high rise buildings in the parish of Westmoreland). The station, however, lacks other equipment, such as, breathing apparatus which may be crucial in the case of a medical emergency or a fire.

The Station is manned over a 24 hours period (based on a shift system) with a staff compliment of approximately 60 medical personnel and fire fighters. Generally, the medical section of the Station is operated over four (4) shifts with 3 medical personnel operating on each shift. The fire fighting section of the Station is also operated over four (4) shifts with seven (7) fire fighters operating the larger fire engine and 4 persons operating the smaller fire engine (per shift).

In the case where assistance is needed the Negril Fire Station, Westmoreland or the Black River Fire Station, St. Elizabeth are contacted.

Cemeteries - There are currently fourteen (14) cemeteries operating in Westmoreland offering services mainly to residents of the parish, of which thirteen (13) are operated by the Westmoreland Parish Council (see Table 20). Five (5) of the cemeteries have exceeded 50% of their burial capacity. The West Palm Memorial Garden has been proposed for operation as a private cemetery in Savanna-la-mar; however, contacts made with the Parish Council of Westmoreland revealed that this proposed cemetery is awaiting approval from the National Environment and Planning Agency.

"It is a fact that in the parish of Westmoreland, Whitehouse has the second highest number of persons and with that knowledge of an increase in the demand for burial space in the parish, the Westmoreland Parish Council has undertaken an initiative to establish a cemetery in the Belmont/Whitehouse area," Mr. Buchanan said (Jamaica Information Service, 2008 July). Besides, the Tate Cemetery, the primary public cemetery, at its location in the parish capital with an average of 69 burials annually, has exceeded 60 % of its capacity.

The survey conducted revealed that 55% of the residents believe that the proposed cemetery is a positive development as shown in Figure 7.

Table 20: Cemeteries in Westmoreland

CEMETERIES OWNED BY THE WESTMORELAND PARISH COUNCIL				
Name of Cemetery	**Location of Cemetery**	**Size of Cemetery**	**% Burials so far**	**Annual Burials**
Tate	Savanna-la-mar	30,975 m.sq	65	69
Bog	Bog	4,200 m.sq.	35	5
Darliston	Darliston	6,525 m.sq.	10	14
St. Pauls	Spring Gardens	3,052 m.sq.	12	3
Red Ground	Negril	4,340 m.sq.	92	19
Prospect Park	Red Hills	5,119.4 m.sq.	45	4
Petersfield	Petersfield	5,958 m.sq.	70	11
Church Lincoln	Grange Hill	3,893.76 m.sq.	20	13
Truro	Burnt Savannah	4,225 m.sq.	30	16
Blackhealth	Georges Plain	19,982 m.sq.	30	16
Jerusalem Heights	Jerusalem Heights	4,046m.sq.	30	4
Sheffield	Sheffield	m.sq.	97	3
Bethel Town	Bethel Town	m.sq.	0.8	5
PRIVATE CEMETERY IN WESTMORELAND				
St. George's Memorial	Savanna-la-mar	m.sq.	75	75

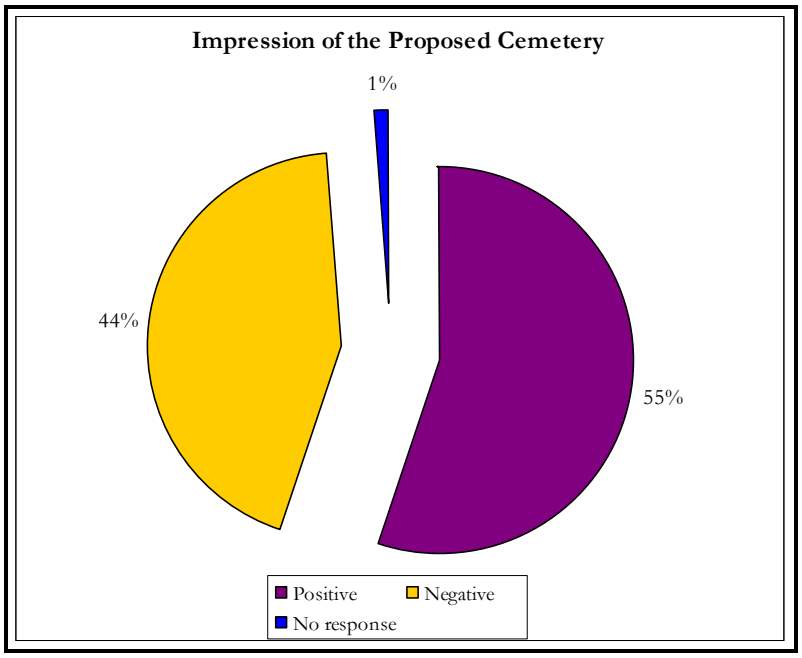


Figure 7: Impression of the Development

3.4.6 Physical Infrastructure

A. Electricity

The development area is currently supplied with electricity by the Jamaica Public Service (JPS) from its sub station at Paradise. The service is generally considered adequate and reliable by the residents interviewed.

In 2001 electricity was found to be the source of lighting in 82% of all households in the parish of Westmoreland compared to the national average of 87%. Other sources of lighting in the parish included that of kerosene.

B. Telephone

Cable and Wireless supplies land line and Cellular services to residents in the development area. Cellular service is also available through Mossel (Jamaica) Limited and Oceanic Digital Jamaica Limited. The extension of landline service to the proposed development is within the capability of Cable and Wireless; however, it is usually advisable to inform the company of any proposed development so it can be included in their development plans.

In 2001 approximately 41% (17,275) of the households in Westmoreland had access to telephones. Of that number, 61% (10,619) of the households had land line telephones in their homes while only 39% had access to mobile cellular phones. Since 2001, however, the use of mobile telephones has increased significantly with the rise in the number of mobile telephone companies active in the country.

C. Potable water supply

Residents in the parish receive potable water supply from a variety of public sources. The parish of Westmoreland is served by 22 water supply facilities in the parish served by 16 springs, 4 wells and 2 river-supplied water treatment plants. The Bluefields/Belmont area is served by the Bluefields Pumping Station System of the NWC.

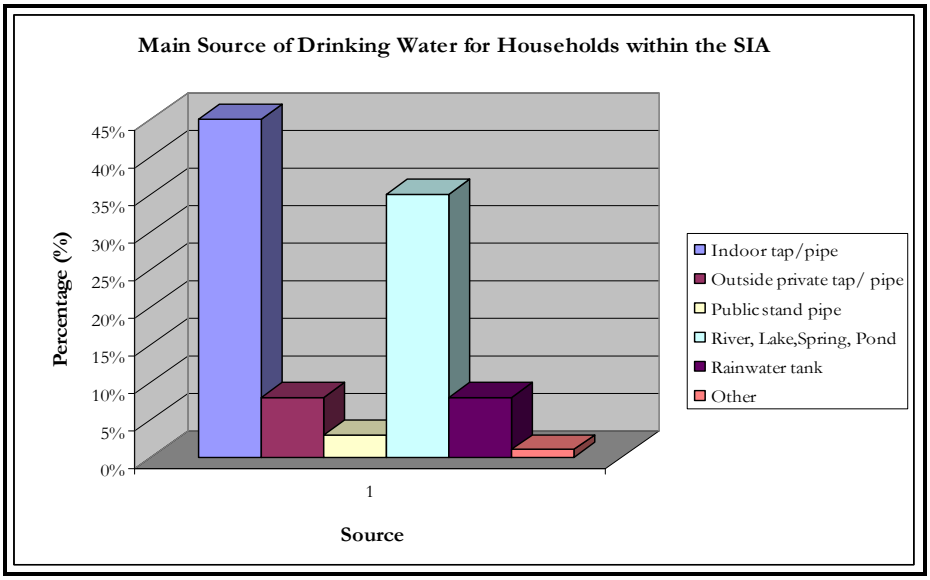


Figure 8: The main source of potable water supply for residents in the SIA area

In 2001, 9,922 of the 42,029 households in Westmoreland received potable water through pipes in their dwellings, 8,761 received water through pipes in their yards, 7,013 households were supplied by community stand pipes and 896 households collected water from catchments. The majority (45%) of the residents interviewed indicated that they receive water through indoor tap (see Figure 8).

D. Waste Disposal

i. Solid waste

The Western Parks and Markets (WPM) Waste Management Limited through the National Solid Waste Management Authority is responsible for solid waste disposal in Westmoreland. Information obtained from the WPM revealed that the collection of solid waste from Belmont is scheduled for Tuesdays, Thursdays and Saturday and is disposed of at the Retirement landfill in Montego Bay, St. James. A significant number (25%) of the respondents indicated dissatisfaction with the garbage collection service in their community.

Of the 42,029 households in Westmoreland in the year 2001, 9,341 households had public collection of garbage while 28,629 households burned their garbage and 650 households buried their garbage.

ii. Waste water

In 2001 the dominant means of sewage disposal for 68.2% of the households in Westmoreland was pit latrine. In contrast, 31.8% of the parish's households disposed of sewage through water closets. When compared with national figures it is shown that the use of pit latrine in Westmoreland is significantly higher than the national figure of 40.6% while the use of water closets is lower than the national figure of 59.2% (PIOJ and STATIN, 2005).

E. Roads, Transportation and Traffic

The proposed development is located along a main coastal road which spans Savanna-la-mar to Whitehouse. Based on site visits the road appears to be in good condition. The proponent of the development also proposes the construction of a main entrance road (from the main coastal road) to the cemetery.

i Traffic survey

Traffic count conducted 2007 Tuesday, March 6 to 2007 Wednesday, March 14, in the vicinity of the Sandals Whitehouse hotel on the 'A' Class main road leading from Whitehouse to Ferris Cross (see Figure 9) was obtained from NWA. Daily traffic traveling along the man road amounted to vehicles over the period. If NWAs formula is applied (3% growth over a ten year period) traffic passing through the area could amount to approximately 12,242 by 2018.

Peak periods were found to be between the hours of 8 - 9 am, 9 – 10 am, 11 am – 12 pm, 12 – 1 pm and 3 – 4 pm and 5 – 6 pm. While there are no estimates for the number of vehicles that will transport mourners to/from the cemetery per household, the following trip generation activities are anticipated:

- Private vehicles - motor cycles and motor bikes to transport persons to school, work, entertainment, recreation and shopping.
- Route taxis – between Belmont/Mount Edgecombe population centres and districts.
- Pedestrians – to recreational activities, to shops, churches etc, personal businesses and to places of employment.

The modal split of transportation within the area is primarily among mini-buses, route taxi, cars, motorcycles, bicycles and would be influenced by land use while the Vehicle Kilometers Traveled (VKT) would be influenced by the external location of places of employment and most social amenities. Transportation to and from the cemetery would include personal vehicle trips as well as those by public and private buses.

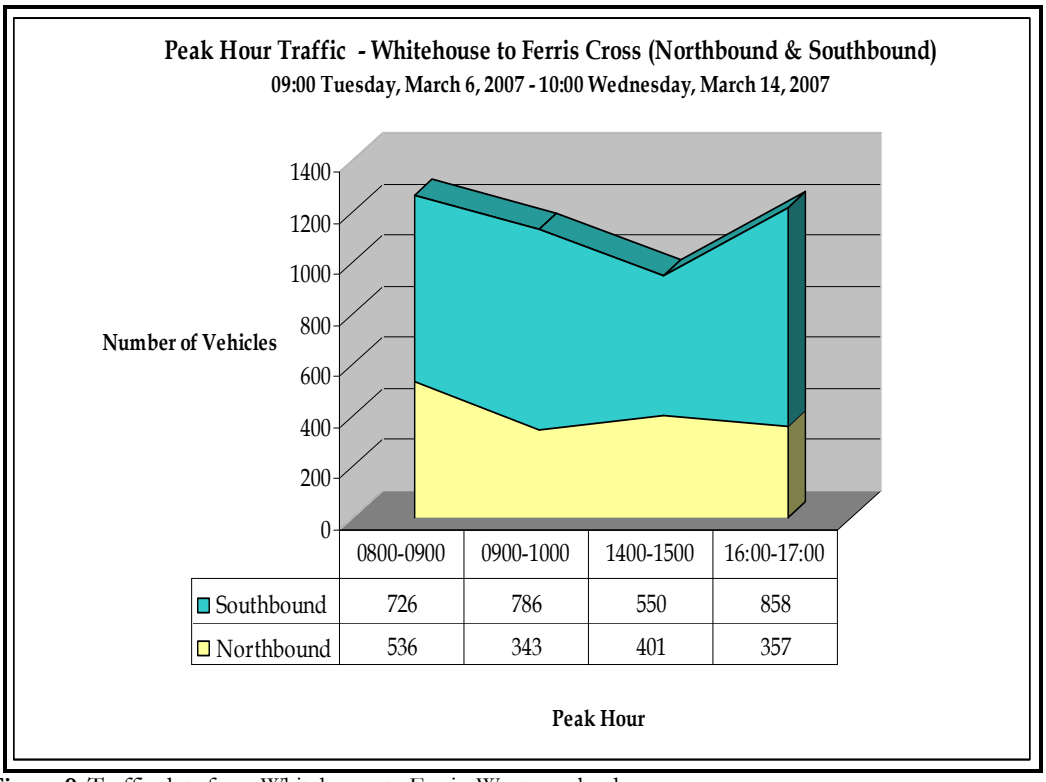


Figure 9: Traffic data from Whitehouse to Ferris, Westmoreland
Source: NWA

Peak hour travel will be influenced by:

- Employment as there is limited scope for employment in the community; hence residents travel to other towns.
- Demographics, for example, the school age population traveling to and from school.
- The Belmont main road is the main arterial connection along the South Coast into Negril, Westmoreland.

3.4.7 Cultural and Historical Heritage

While the most significant site of cultural or historical significance in the area is the Peter Tosh memorial site, other sites of significance in the region are:

Savanna-la-mar Baptist Church – the Baptist church in Savanna-la-mar was erected in 1835. It was destroyed by fire on the 23rd November 1839 and rebuilt in 1840.

Negril Point Lighthouse – This Lighthouse is situated at south Negril Point which is at the extreme western end of the Island. The Negril Lighthouse was built in 1894 on a tank 14 feet deep, which is kept filled with water to keep the Tower balanced and secured in the event of an earthquake.

Savanna-la-mar Fort – The fort at Savanna-la-mar is called the Fort located on Great George Street. The fort was built in the 18th Century originally to protect the town but was never completed. It had mounted 18 to 20 guns and only promised security against pirates.

Savanna-la-mar Court House – was built in 1925. It is located on Great George Street, one of the major streets in the town.

Cast Iron Fountain – Located near to the Courthouse in Savanna-la-mar, Westmoreland, is a Corinthian fluted Cast iron Fountain.

Manning's High School – The Thomas Manning Building was built from timber and the rest on a masonry plinth. The building is a good example of colonial architecture.

Funeral rites in Jamaica reflect a wide variety of cross-cultural diversity. Cultural practices which have remained constant in funeral services - communicating with the death, care of the deceased, a method of burial, a ceremony or ritual and sometimes there are memorials which are repeated annually.

Culturally, burial services are held on Sundays and Saturdays. Common practice is for a church service followed by burial hence the proposal to include a Chapel in the development plan for the cemetery. The dead are usually buried in a cemetery, on church grounds/graveyard, in family plots, (this method of burial is practiced mainly in rural areas) or their bodies are cremated. The traditional colours for funerals are black, purple and white. However, bright colours are now being incorporated as they look at death and the burial service as a celebration of the person's life.

3.4.8 The Cemetery's Potential for Generating Substantial Controversy

Issues that may arise are the potential impacts to the total water budget in the area and potential short term increases in traffic during ceremonies at the proposed cemetery. However, the actual projected usage of water by the cemetery is expected to have an insignificant impact once the recommended mitigations actions are implemented. Without the widening of the main road there would be the need to ensure adequate police escort to assist in managing short term traffic flow increases at the commencement and the end of funeral ceremonies as ample parking will be provided on site. This measure would avert the potential major impact on traffic congestion in the vicinity of the proposed cemetery especially given the potential for conflict between the vehicles of mourners and other traffic along the main road.

3.5 Public Participation

Public Consultation is an integral part of the EIA process as it ensures that the views (on the proposed development) of the local community members and stakeholders are heard and taken into consideration. The public consultation

included telephone conversations with selected stakeholders in the parish of Westmoreland (Table 21) and a survey conducted in communities within a 1.5 km radius of the proposed site location.

Table 21: List of selected stakeholders and their comments on the proposed development

CONTACTS	COMMENTS	DATE
Haile Mika'el Bluefields CDC	Location is ok. We need a cemetery as long as it is environmentally safe. Other cemeteries are located near other main road and people and nothing has happened to them.	2008 September 26
Mr. Michael Jackson Whitehouse CDC/DAC	Need a cemetery, however, close proximity to school and seepage into the sea. It should be placed into the hills so that drainage wont get to the sea.	2008 September 26
Mr. Astil Gage Beeston Spring CDC	Necessary as there is none in the area. The problem is the location as it is prime land and it is close by a school.	2008 September 26
Mr. Keith Wedderburn Bluefields CDC	Mount Edgecombe property has a lot of land and where they are placing the cemetery could be another location on the property and not necessarily beside the school.	2008 September 26
Ms. Donna Moodie Bluefields CDC	No water source there and so wont pose a problem.	2008 September 26
Loggan McIntyre Belmont	Good idea but the location is poor. The area beside the school should be used as housing for persons going to the school and the cemetery should be placed further away.	2008 September 26
Mr. Delburt Rodney Businessman, Belmont	Too near to the road	2008 September 26

Source: Telephone interviews

LEGEND	
CDC	Community Development Committee
DAC	Development Area Committee

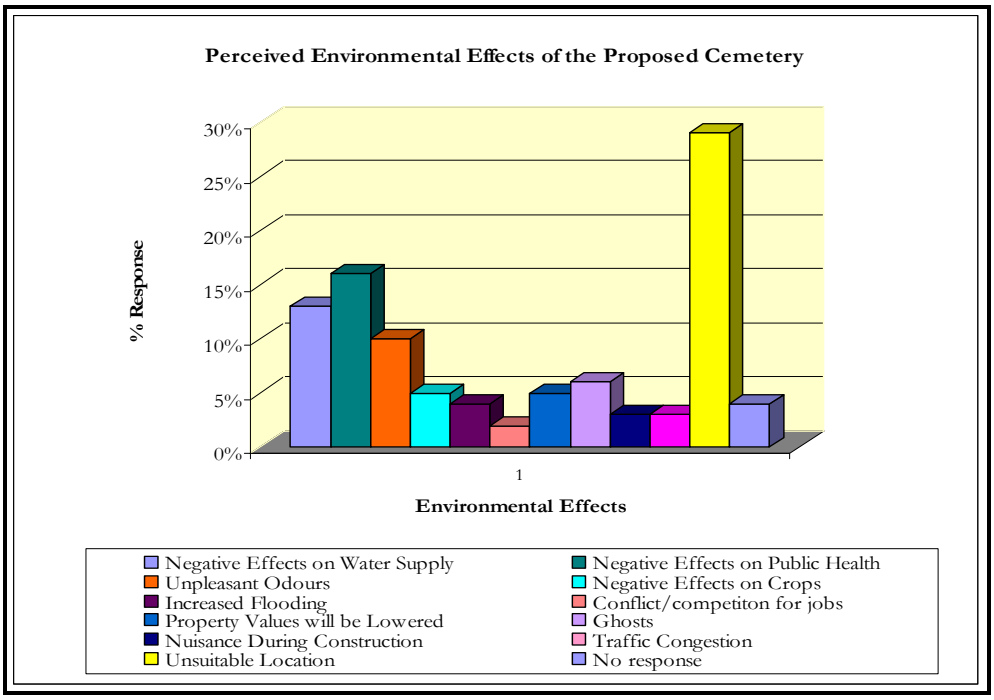


Figure 10: Perceived effects of the proposed cemetery on the environment.

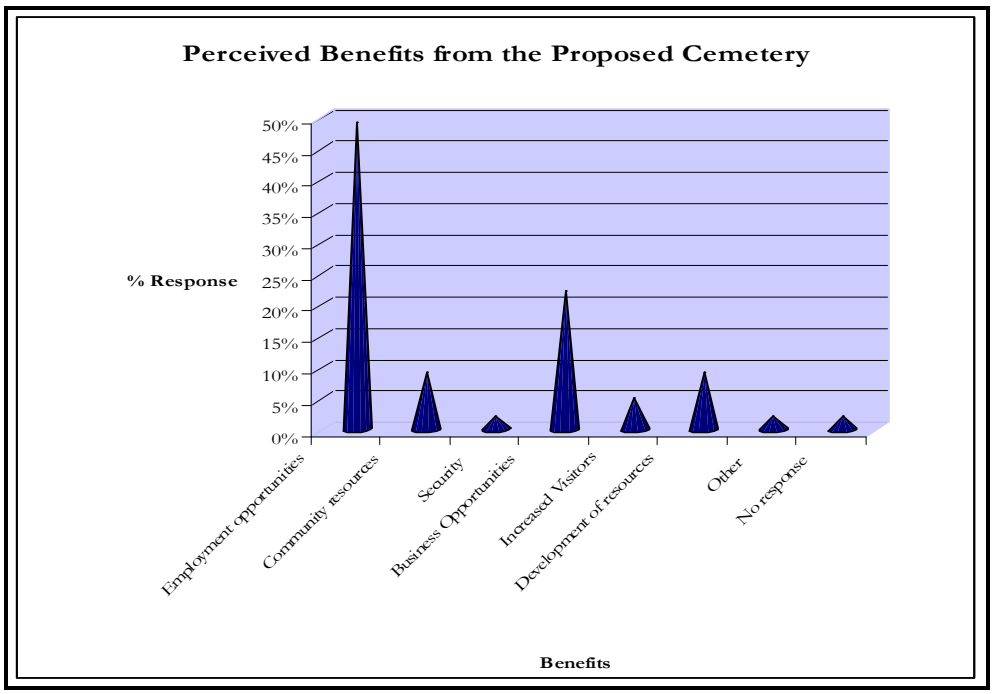


Figure 11: Perceived benefits of the proposed cemetery on the community

The community survey also revealed mixed reactions to the proposed cemetery. Of the survey sample, (29%) perceived the location for the cemetery to be unsuitable (see Figure 10). In contrast almost half (49%) of the respondents perceive employment opportunities to be an important benefit to be derived from the development of the cemetery while "business opportunities" was perceived as a benefit by 29% (see Figure 11).

3.6 Impacts and Mitigation

3.6.1 Assumptions and Assessment Guidelines

1. Physical and Marine Resources

a. Geology

The Proposed Action would normally have a significant effect on the environment if it would:

- Expose people or structures to major geologic hazards

b. Soils Resources

The Proposed Action would normally have a significant effect on the environment if it would:

- Cause substantial erosion
- Cause the substantial production of agricultural crops

c. Surface waters

The Proposed Action would normally have a significant effect on the environment if it would:

- Substantially degrade water quality
- Contaminate a public water supply
- Cause substantial flooding or siltation
- Substantially alter surface flow conditions, patterns, or rates.

d. Ground Waters

The Proposed Action would normally have a significant effect on the environment if it would:

- Substantially degrade water quality
- Contaminate a public water supply
- Substantially degrade or deplete ground water resources

2. Air Resources

The Proposed Action would normally have a significant effect on the environment if it would:

- Violate any regulatory requirement of NEPA
- Violate any ambient air quality standard
- Expose sensitive receptors to substantial pollutant concentrations

3. Biological Resources

The Proposed Action would normally have a significant effect on the environment if it would:

- Substantially affect a rare or endangered species of animal or plant or the habitat of the species
- Interfere substantially with the movement of any resident or migratory wildlife species
- Substantially diminish habitat for wildlife, or plants

4. Social Impact Assessment

The Proposed Action would normally have a significant effect on the environment if it would:

- Substantially exceed carrying capacities of community resources

- Present risk to human health and safety
- Does not conform to the participatory development process

The checklists below rate the level of impact, their duration, and significance and whether they are direct or indirect based on the following legend:

LEGEND: Environmental Issues

IMPACT	RATING
I	No Impact
II	Low
III	Moderate
IV	High
SIGNIFICANCE	**RATING**
I	Not significant
II	Less Than Significant Impact
III	Potentially Significant Impact
DURATION OF IMPACT	**RATING**
I	None
II	Short Term
III	Medium Term
IV	Long Term
DIRECT/INDIRECT IMPACT	**RATING**
I	No Impact
II	Direct
III	Indirect
* - Identifies positive Impacts	

3.6.2 Potential Impacts on Physical and Marine Resources and Mitigation

1a. Geology, Soils and the Marine Environment: Impacts on Public Safety and Structures

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
I. Geology, Soils and Marine Environment Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) rapture of a known earthquake fault, as delineated on the most recent earthquake fault zoning map issued by the state geologist for the area based on other substantial evidence of a known fault?	I	I	I	I
ii) strong seismic ground shaking?	I	I	I	I
iii) seismic related ground failure, including liquefaction?	I	I	I	I
iv) landslides?	I	I	I	I
b) Result in substantial soil erosion or the loss of top soil?	III	II	III	II
c) Be located in a geological unit or soil that is unstable, or that would become unstable, as a result of the project, and potentially result in on or off-site landslide lateral spreading, subsidence, liquefaction or collapse?	I	I	I	I
d) Be located on expansive soil, creating substantial risk to life or property?	I	I	I	I
e) Have soil incapable of adequately supporting the use	I	I	I	I

of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?	I	I	I	I
f) Result in unstable marine and coastal environment?	II	II	IV	III

1b. Soils and the Coastal Environment: Significant Impacts and Mitigation Measures

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Soils	**Impact** No major impacts are expected from the proposed cemetery. The soil on site is classified as the Carron Hall Clay (no. 94) type This unit features shallow soils, stony surface, moderate to slow internal drainage. In addition, the percolation test results show that the absorption properties of the soil vary from 4.7 minutes per cm to 9 minutes per cm (12 minutes per inch to 23 minutes per inch). This implies that the percolation rate of the soil is relatively low under worst case conditions and given that the average depth to groundwater is 5 metres, the percolation of fluids from the cemetery site into the groundwater is unlikely if the recommendation for best practices for vault construction is strictly followed.

2a. Hydrology and Water Quality: Impacts on Eco-systems and Public Health

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
II. Hydrology and Water Quality Would the project:				
a) Violate any water quality standards or waste discharge requirements?	I	I	I	I
b) Substantially deplete ground water supplies or interfere substantially with ground water recharge, such that there would be a net deficit in aquifer volume or a lowering of the local ground water table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted)?	I	I	I	I
c) Substantially alter the existing drainage pattern of the site or the area, including thorough alteration of the course of a stream or river, in a manner which will result in on or off site erosion or siltation?	II	II	IV	II
d) Substantially alter the existing drainage pattern of the site or the area, including thorough alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in on or off site flooding?	II	II	IV	II

e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantially additional sources of polluted runoff?	II	III	III	II
f) Substantially degrade water quality?	I	I	I	I
g) Place housing within a 100-year flood hazard area, as mapped on a federal flood hazard boundary or flood insurance rate map, or other flood hazard delineation map?	I	I	I	I
h) Place structures that would impede or redirect flood flows within a 100-year flood hazard area?	I	I	I	I
i) Result in inundation by hurricane or tsunami?	III	II	IV	III

2b. Hydrology and Water Quality: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Water quality	**Impact** Water quality is not likely to be affected during the construction/implementation of the cemetery. Water levels are fairly constant throughout the year and do not reflect the seasonality of rainfall. This provides further evidence that surface water does not percolate rapidly to the groundwater table.
Operation/Maintenance	
Water quality	**Impact** The groundwater resource in the area cannot be used for domestic purposes because of its high salinity. Hence, residents will not be affected by poor water quality during the operation phase of the cemetery. The low intrinsic permeability of the regional limestone, minimal occurrence of karstification within the unit and the physical characteristics (type and internal drainage capacity) of the overlying soil unit do not make the regional water resources highly susceptible to point source pollution.

3a. Local Climate: Impacts on Ecology and the Public

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
III. Local Climate Would the project:				
a) Have a substantially adverse effect on climate through the use of concrete and tarmac?	II	II	IV	III
b) Substantially reduce the number of trees in the project area?	II	II	IV	II
c) Create a new source of substantial light or glare which would adversely affect day or night time views in the area?	I	I	I	I

3b. Local Climate: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Operation/Maintenance	
Local Climate	**Impact** It is likely that the micro-climate at the project site will be altered from its present condition due to the scale of the project. Operational aspects that are likely to alter micro-climate include: ▪ Reduced numbers of trees ▪ Increased paved surfaces (heat trapping) ▪ Increased ambient lighting. **Mitigation** It is recommended that the developers try to maintain as much tree cover as possible.

4a. Hazards: Impacts on Public Safety, Structures and Ecology

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
IV. Hazards -Natural Would the project:				
a) Result in substantial damage from flooding caused by torrential rainfall?	I	I	I	I
b) Result in serious loss or damage from the primary and secondary effects of a hurricane?	II	II	IV	III
Hazards – Other Would the project:				
a) Expose the population to hazardous materials?	II	II	IV	III
b) Expose the natural environment to hazardous materials?	II	II	IV	III

4b. Hazards: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Operation/Maintenance	
Hazards	**Impacts** Following the occurrence of a natural disaster, the following effects can occur: ▪ Water pollution and increased public health risk. ▪ Disruption in essential services: power, water, communications. ▪ Blockage of access roads by debris. ▪ Wind, water or structural damage to property, and effects on business operations and insurance. **Mitigation** The vulnerability of the site would be tempered by the preparedness of the operators although the most vulnerable structure would be the Chapel. Proposed drainage solutions would reduce any impact of erosion of the burial sites. . It is recommended that a Disaster Management Plan be developed for the property, which should cover design and planning, preparedness aspects, and emergency response and recovery procedures at a minimum.

3.6.3 Impacts on the Terrestrial Resources and Mitigation

1a. Biology: Impacts on the Terrestrial Environment

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
V. Biological Resources Would The Project:				
a) Have a substantial adverse effect, either directly or through habitat modification on any species identified as a candidate, sensitive or special status species in local or regional plans, policies or regulations, or by NEPA?	I	I	I	I
b) Have substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations or by NEPA?	I	I	I	I
c) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native residents or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	II	II	IV	II
d) Conflict with any local policies or ordinances protecting biological resources such as a tree preservation policy or ordinance?	II	II	IV	II
e) Have a substantial adverse effect on any protected areas identified by local policies and regulations or by NEPA?	I	I	I	I

1b. Biology: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
	Construction/Implementation
Biology	**Impact** *Flora* - the proposed development will not result in any major negative impact to the flora of the site. The vegetation of the proposed development area is severely degraded as tree density; tree diversity, canopy cover and species diversity were very low. **Mitigation** Although the impact of the development on the flora at the property will be minimal mitigation methods can, nonetheless, be implemented. The large tree of the property should be retained and protected where possible to enhance the aesthetics so retained and newly planted species will facilitate avifaunal species present at the property. Additionally, the vegetation along the borders of the property should be maintained to mitigate against any impacts of flooding which may occur adjacent to the property. **Impact** *Fauna* – The low level of vegetation cover on the site means that abundance and diversity of fauna on the site were also low since the faunal species depend on the resources of the natural vegetation. Bird and butterfly species diversity was low, no mammals or herpetofauna or nocturnal species were observed on site. The existing fauna was predominantly composed of species that prefer human-disturbed habitats, early succession sites, or otherwise open, relatively dry and sunny habitats. As such, the proposed site development will not have any important direct negative impact on the natural vegetation that remains and they should not significantly escalate or introduce new impacts on local biodiversity on-site.

INDICATOR	IMPACT & MITIGATION
	Construction/Implementation
Biology	**Mitigation** None necessary. **Impact** The indirect, off-site impacts of the development are not considered important. However, the disturbance of the soil during the construction phase and also during its use as a cemetery could result in an increase in the movement of soil, rubble among other water transported material into the wetlands located to the south west of the site. While this wetland system was not assessed in detail, wetlands are valuable and fragile systems, and it is known that wetlands across the Caribbean contain many globally threatened species due to the rapid loss of this ecosystem over the last century. Wetlands perform many vital ecosystem services including coastal protection, fish nurseries, and flood mitigation, to name but a few (Jeffries & Mills1990). **Mitigation** Both deliberate activities such as dumping or unintentional impacts such as the movement of silt or solid materials by runoff will be prevented during all phases of the project. The removal and transportation of soil and all other waste should be monitored to ensure that neither organic nor inorganic matter enter and overwhelm the wetland system. Additionally the necessary precautionary actions, including appropriate engineering solutions approved by the NWA would be taken to prevent the movement of sediment runoff due to either natural drainage or flood events.

3.6.4 Potential Socio- economic Impacts

1a. Aesthetics: Impacts on the Public and Environment

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
VI. Aesthetics Would the Project:				
a) Have a substantially adverse effect on the scenic vista?	II	II	IV	III
b) Substantially damage scenic resources, including, but not limited to trees, within a scenic highway?	III	III	IV	II
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	I	I	I	I
d) Create a new source of substantial light or glare which would adversely affect day or night time views in the area?	I	I	I	I

1b. Aesthetics: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
	Construction/Implementation
Scenic Vista	**Impact** It is not anticipated that the scenic vista of the area will be greatly affected by the development as few trees will be removed from the property. **Mitigation** The scenic vista of the area will be restored once construction activities begin, bringing a new landscape to the area. Additionally, specific trees will be marked for landscaping purposes and others required will be obtained.
	Operation/Maintenance
Scenic Vista	**Impact** It is not anticipated that there will be any negative impacts associated with the scenic vista of the site during the operation/maintenance phase as the development will be aesthetically pleasing.

2a. Air Quality: Impacts on Public Health

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
VII. Air Quality Would the Project:				
a) Violate any air quality standards or contribute substantially to an existing or projected air quality violation?	I	I	I	I
b) Result in a considerable cumulative net increase of any criteria pollutant based on NEPA ambient air quality standards (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	I	I	I	I
c) Expose sensitive receptors to substantial pollutant concentrations?	II	II	IV	II
d) Create objectionable odours affecting a substantial number of people?	I	I	I	I

2b. Air Quality: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
	Construction/Implementation
Air Quality	**Impact** In general the impact is short term (limited to the construction phase). The operations of heavy-duty vehicles and equipment are likely to produce increased combustion emissions. Also, there is the potential for increased atmospheric dust from bare soils, stockpiles, uncovered, overloaded trucks and storage equipment. This impact is classified as minor because of: ▪ Relative isolation of most the site from residential and built areas. The transport of materials from source to site would entail use of heavy trucks, which have the potential to produce polluting gaseous emissions and dust, depending on the material being transported. The movement of heavy trucks could also lead to additional road wear. These impacts are of short-term duration, but are of particular importance, as the main road leading to the site is a major thoroughfare, which already has a high volume of vehicular traffic. **Mitigation** Dust carrying equipment and facilities should be wetted frequently to minimize the amounts of dust affecting the site. Roads (paved and unpaved) should be wetted to lessen the possibility of dust emissions affecting site. The contractor should ensure that trucks carrying construction and solid materials are covered with tarpaulins to reduce air pollution. Vehicles should be properly maintained and serviced to reduce emissions. Dust masks and other personal protection equipment (PPE) should be provided wherever possible to workers on the site in order to safeguard their health.
	Operation/Maintenance
Air Quality	**Impact** There is expected to be an increase in particulate matter (dust) once the cemetery is in operation as a result of ground preparation activities (for burial plots). The proposed development is expected to have bare soils periodically, and has the potential to generate fugitive dust. However, as it relates to odour nuisances, there should be no impact as no cremations will take place on the property. Also the increase in vehicular traffic in the area will most likely increase the level of exhaust emissions.

Air Quality	**Mitigation** The wetting of the soil will have to be done to reduce the number of particulate matter in the atmosphere especially when wind speed increases.

3a. Noise and Vibration: Impacts on the Public

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
VIII. Noise and Vibration Would the project:				
a) Generate or expose people to noise levels in excess of standards established in a local general plan or noise ordinance, or in other applicable local standards?	II	II	IV	I
b) Generate or expose people to excessive ground-borne vibrations or ground-borne noise levels?	I	I	I	I
c) Create a substantial permanent increase in ambient noise levels in the vicinity of the project (above levels without the project)?	II	II	IV	I

3b. Noise and Vibration: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Noise & Vibration	**Impact** Noise and vibration are likely to be produced by the use of heavy machinery, vehicles and equipment. This above ambient level noise during construction is expected to affect on site workers and to a lesser degree the community. The impact of noise is classified as minor as the site (construction area) is not located in close proximity to residences in the existing communities. **Mitigation** These effects are not expected to be persistent after the construction period. This impact can be mitigated through the institution of an appropriate schedule of activities during the construction phase which will help to alleviate the impacts of increased noise, dust, etc. likely to result from construction activities. The activity schedule will be distributed to residents of the surrounding communities. Additionally, construction activities will take place during periods when disturbances to the residents and passers-by are minimized and equipment will be properly maintained.
Operation/Maintenance	
Noise	**Impact** Noise levels should not be greatly impacted by the development as funeral ceremonies will occur during acceptable hours (daylight hours) and noise levels will comply with that of the Noise Abatement Act, 1997. The adjacent new high school may be affected by an increase in noise levels if funeral ceremonies are held during school hours. **Mitigation** The number of burials conducted on week-days would have to be limited to particular hours (mainly outside of school hours) of the day.

4a. Waste and Hazards: Impacts on Public Health and the Environment

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
IX. Waste and Hazards Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous material?	I	I	I	I
b) Create a significant hazard to the public or the environment through reasonable foreseeable upset and accident conditions involving the release of hazardous materials in the environment?	I	I	I	I
c) Be located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport? If so, would the project result in a safety hazard for people residing or working in the project area?	I	I	I	I
d) Substantially increase solid waste in the project area thereby exceeding the present landfill capacity?	II	II	IV	III
e) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	I	I	I	I

4b. Waste and Hazards: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
	Construction/Implementation
Solid Waste	**Impact** Construction and other activities on site will produce solid waste in significant amounts. This includes various types of wastes including vegetation and construction debris, construction packaging materials, and domestic wastes from the construction camp (e.g. juice boxes, Styrofoam boxes, bottles, etc.). The effects of this include demand for land fill space, potential for loss of visual amenity if not properly stored and collected on site, and the potential for vermin to be attracted particularly in relation to food wastes from the construction camp. Appropriate holding area sites have would be determined. **Mitigation** Its effects can be effectively mitigated against by implementation of a waste management plan at the construction camp. This plan should cover separation and appropriate storage of the different kinds of waste including oily rags from the servicing of equipment if this is to be done at the construction site. Organic waste, namely vegetation, could be composted on site and used for soil improvement (soil conditioning) during landscaping. Branches can be put through a wood chipper to prepare soil cover for garden beds, etc. Adequately located and maintained temporary latrine facilities would be made available for construction workers. To avoid the harmful effects of poor solid waste disposal adequate arrangement would be made with WPM or with a private contractor to dispose of solid waste at the authorized dumpsite at Retirement land fill, St. James. Some materials can be beneficially re-used (e.g. vegetation debris can be chipped and used as mulch during landscaping). It is expected that any top soil that is removed during grading would be stockpiled properly, and re-used during the final landscaping efforts as well as in the preparation of graves. Waste materials will be recycled where possible.

5a. Social Infrastructure: Impacts on Public Services within the Development area

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
X. Social Infrastructure Would the project:				
a) Result in substantial adverse impacts associated with the provision of new or physically altered governmental facilities, or the construction of which could cause significant environmental impacts in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public service?	II	II	IV	III
▪ Fire Protection?	II	II	IV	III
▪ Police Protection?	III	III	IV	III
▪ Schools?	I	I	I	I
▪ Health Centres?	II	II	IV	III
b) Provide a substantial number of employment opportunities for neighbouring community members throughout the project lifecycle?	II	III	IV	II

5b. Social Infrastructure: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Employment	**Impact** * The proposed project provides the opportunity for livelihood opportunities workers and tradesmen for the duration of construction period and eventually, the means of improving the socio-economic status of members of the community. New jobs (up to about 20) created during the construction phase could result from activities in the development of infrastructure and the sewage treatment facility. Another beneficial consequence of the project is the income generated to shop owners in the community through provision of materials and services to the project and others within near by towns, such as, taxi and mini bus drivers. Priority will be given to residents within the immediate community for employment possibilities created during the implementation of the project.
Operation/Maintenance	
Employment	* Livelihood opportunities in the operation phase will be just as significant as, or even greater than the construction phase for e.g. grave diggers, grounds-men. Employment will also be provided in the informal sector e.g. vendors.

6a. Utilities and Services: Impacts on Social Services and Resources

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
XI. Utilities and Services: Would the project:				
a) Exceed wastewater treatment restrictions or standards of NEPA?	I	I	I	I
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	II	II	IV	II
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	II	II	IV	II
d) Significantly deplete water supplies available to serve the project from existing entitlements and resources?	I	I	I	I
e) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	III	III	IV	III
f) Comply with NEPA statutes and regulations as they relate to solid waste?	II	II	IV	III
g) Significantly increase energy consumption in the project area which would contribute substantially to the greenhouse gases?	II	I	I	I

6b. Utilities and Services: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Utilities and Services	**Impact** The proposed cemetery will produce an unknown quantity of solid waste. This is considered a moderate environmental impact, as the exact quantity is unknown. The effects of this waste production can include: ▪ Increased demand for and consumption of limited land fill space and municipal collection services. ▪ Increased use of roads by collection trucks which could affect the surface of the road, congestion, fugitive dust along roads. ▪ Breeding of pests and disease vectors such as flies, vermin and roaches if storage areas are not hygienically maintained. ▪ Visual dis-amenity and odours, particularly if waste is transported to beaches, and associated negative impacts on tourism and residential land uses. **Mitigation** ▪ Adequate solid waste storage bins and other facilities all around the property. Storage containers should be tightly covered to prevent the breeding of mosquitoes and other vermin. ▪ Proper collection and disposal should be done everyday at all the sites of these garbage disposal facilities to ensure that there is no overloading of solid waste.

INDICATOR	IMPACT & MITIGATION
	Construction/Implementation
Utilities and Services	**Impact** *Water* - the nature of the development requires water for everyday usage. There is also the need for water in case of fire. Landscaping also require very large quantities of water. Water in this area is provided from the Bluefields Pumping Station operated by the NWC. **Mitigation** Protection of recharge areas in the source catchment is the most effective means of mitigating against the increased demand, as it will safe guard water production. However, there are other measures that could be implemented by the developer, including: ▪ Re-use of treated wastewater and storm water for irrigation. ▪ There should be on site reserves of water in the event of disruption of public supplies (due to drought or heavy turbidity). ▪ Indigenous ornamental tree/plant species that do not require large amounts of water should be used for landscaping as far as possible. **Impact** *Energy Consumption* - it is not expected that the development will demand very large amounts of electricity and fuel on a daily basis. Although the power demand can be met by JPSCo. the issue pertains to the use of non-renewable resources, and the national fuel bill, as well as, contributions to green house gases, which are ultimately detrimental to the environment. **Mitigation** Cognizant of this, it is strongly recommended that the following mitigation measures be considered: ▪ There should be energy saving lighting installed for the chapel etc using lights and other energy star rated equipment.

7a. Cultural Resources: Impacts on Historical Features and Resources

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
XII. Cultural Resources Would the Project:				
a) Cause a substantial adverse change in the significance of a historical resource?	I	I	I	I
b) Cause a substantial adverse change in the significance of an archaeological resource?	I	I	I	I
c) Directly or indirectly destroy a unique palaeontological resource or site or unique geologic feature?	I	I	I	I
d) Disturb any human remains, including those interred outside of formal cemeteries	I	I	I	I

7b. Cultural Resources: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Historical Resources	**Impact** * It is not anticipated that there will be impacts associated with the historical resources of the site.

8a. Land Use and Planning: Impacts on Community Conservation and Habitat Conservation

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
XIII. Land Use and Planning Would the project:				
a) Physically divide an established community?	I	I	I	I
b) Conflict with the applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited, to a general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	II	II	II	III
c) Conflict with any applicable habitat conservation plan or natural community conservation?	I	I	I	I

8b. Land Use and Planning: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Community Conservation	**Impact** The project will be located adjacent to a high school currently under construction. **Mitigation** Dialogue will be initiated with the citizens, teachers and students to ensure that their interests are protected.

9a. Population and Housing: Impacts on the Public and Social Infrastructure

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
XIV. Population and Housing Would the Project:				
a) Induce substantial population growth in the area, either directly (for, example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	II	II	IV	III
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	I	I	I	I
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	I I	I I	I I	I I

9b. Population and Housing: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Population growth	**Impact** *It is not expected that the population of Bluefields/Belmont will experience a dramatic population growth in the short to medium term. However, the extension of infrastructure in the development area, as well as, the potential employment opportunities could indirectly influence the movement of people to the area.

10a. Transportation and Traffic: Impacts on Public Safety and Travel

ENVIRONMENTAL ISSUES	IMPACT	SIGNIFICANCE	DURATION OF IMPACT	DIRECT/INDIRECT IMPACT
XV. Transportation and Traffic Would the project:				
a) Cause a substantial increase in traffic, in relation to existing traffic load and the capacity of the street system (i.e., a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	III	III	IV	III
b.) Exceed, individually or cumulatively, the level of service standards established for the designated roads or highways?	II	II	IV	III
c) Cause a change in driving patterns, including either an increase in traffic levels or a change in location that result in substantial safety risk?	II	II	IV	III
d) Contain a design feature (e.g., sharp curves or dangerous intersection or incompatible uses (e.g., farm equipment) that would substantially increase hazards?	I	I	I	I
e) Result in inadequate emergency access?	I	I	I	I
f) Result in inadequate parking capacity?	II	II	IV	III

10b. Transportation and Traffic: Significant Impacts and Mitigation

INDICATOR	IMPACT & MITIGATION
Construction/Implementation	
Traffic	**Impact** There will be an increase in traffic volume during the construction phase of the project. The travel of employees to and from work will increase traffic flow especially during peak hours, while the transportation of paving, filling and other construction material as well as solid waste may increase traffic flow during both peak and off-peak periods. An increase in traffic flow may inadvertently result in traffic accidents. **Mitigation** The development of a funeral schedule; e.g. during the off-peak hours would help to alleviate the effects of traffic congestion. While the use of flag-men during the construction period could aid in the direction and flow of traffic during peak periods.
Operation/Maintenance	
Traffic	**Impact** There will be a significant increase in traffic levels especially on weekends when funeral ceremonies and processions are most likely to occur. **Mitigation** The use of police officers to lead funeral processions may reduce the increase in traffic which will be created by mourners when traveling to the cemetery.

3.6.5 Cumulative Impacts

Environmental impacts are considered *cumulatively considerable* when the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other and current projects and the effects of future projects. The site of the Proposed Action would occur in a relatively underdeveloped coastline in the parish but in close proximity to the Belmont community. However, a number of resort projects are in the pipeline for the area. A summary of the geographical extent of the proposal is shown in Table 22 below.

Table 22: Geographic scope of cumulative impacts

RESOURCE ISSUE	GEOGRAPHIC AREA
Visual Resources	Local
Air Quality	Regional (pollutants with regional effects) and project area (highly localized pollutants
Biological Resources	Regional and local
Land Use Planning	Regional and local
Cultural Resources	Local (project area)
Geology, Soils and Seismicity	Local
Hazards and Hazardous Materials	Local (within the vicinity of the project)
Hydrology and Water Quality	Local and regional
Noise	Local (within immediate project vicinity)
Employment and Population	Regional (with the parish, and adjacent parishes or islandwide)
Public Services and Utilities	Regional (potable water, electricity, solid waste, police, fir and postal services)
Transportation and Traffic	Regional and local
Marine Water Quality	Local (within adjacent areas)

Source: Personal interpretation

3.6.6 Residual Impacts

The residual impacts of the project will be significant of which changes in land use will be the most suitable. Land use changes will impact the primarily the biological, physical resources and social infrastructure.

3.6.7 Swift Benefit/Cost Analysis

Benefit/Cost to Environmental Resources

INDICATORS	BENEFITS TO THE ENVIRONMENT	COST TO THE ENVIRONMENT	MONETARY VALUE
1) Aesthetics	The proposed development will be aesthetically pleasing.	–	–
2) Air Quality	–	Air quality would be negatively affected (increase in particulates) as a result of ground preparation activities before and during burials.	–
3) Marine Water Quality	–	Marine water quality would possibly be affected by soil erosion from the property.	–
4) Waste & Hazardous Material	–	–	Cost to implement a HAZOP Programme
5) Topography & Drainage	–	Both drainage and infiltration capacity would be reduced possibly causing increased surface runoff.	–
7) Climate	–	–	
8) Energy Consumption	Alternate forms of energy to be utilized where feasible e.g. use of solar energy.	–	▪ Cost per kilowatt of energy X projected consumption (annual)
9) Natural Hazards	Proper building design and construction practices would be encouraged and employed so as to reduce the risk of loss of life and damage to property by natural hazards such as hurricanes, flooding, storm surges, etc.	Hazards such as hurricanes and flooding may cause damage to the structures to be located on the property as well as destroy flora and fauna on the property.	▪ Cost to rebuild/repair structures on property (cost depends on the extent of damage) ▪ Cost to replant trees and plants (cost depends on the extent of damage). ▪ Cost for property insurance ▪ Cost to property insurance providers
10) Other Hazards	–	Other hazards such as health–ecological and social-organizational hazards may be anticipated. These may pose a threat mainly to the developer, employees and mourners.	–
11) Upset & Accidental Conditions	–	Because accidents are unpredictable they may result in loss of life and damage to property and the environment.	▪ Cost for Life Insurance – Minimum of $1,000 monthly per employee ▪ Cost for Property Insurance (depends on the value of the property).

INDICATORS	BENEFITS TO THE ENVIRONMENT	COST TO THE ENVIRONMENT	MONETARY VALUE
12) Biological Resources i) Marine Resources ii) Land Resources	–	i) Marine resources would most likely be negatively affected through increase in sediments and possible loss of habitat. ii) The development area would experience a reduction in faunal and floral species as a result of clearance.	–

Socio-economic Cost/Benefit

INDICATORS	SOCIO-ECONOMIC BENEFITS	SOCIO-ECONOMIC COSTS	MONETARY VALUE
1) Police	Possible renovation of the Bluefields Police Station to meet the increase in demand for its services especially during funeral processions.	Increased pressure on the service of the Bluefields Police Station (mainly the demand for vehicles to lead funeral processions).	▪ Cost to purchase additional vehicles i) 2008 Toyota Corolla – approximately $2.5 million ii) 2008 Toyota Land Cruiser - $5.1 million iii) 2005 Honda CBX 750 Bike $820,000
2) Post Office	–	–	–
3) Schools	–	The new high school which is located adjacent to the proposed development will possibly be affected by the increase in noise levels during funeral services and burials and increase traffic.	–
4) Hospitals	–	–	–
5) Health Centres	–	–	–
6) Fire	–	Increase in demand for the services offered by the Bluefields Fire Station.	▪ Cost to acquire new equipment for the Fire Station.
7) Employment	The proposed development has a job creation potential. Jobs will be created in the pre-construction phase, the construction phase and the operational phase of the development.	Increase in competition between locals and persons outside the development area to gain employment.	–
8) Housing	–	–	–
9) Public Utilities	Public utilities such as potable water supply, telephone and electricity would be improved upon within the development area.	Increase in pressure on service providers such as the NWC and the NWA to provide services to the development area.	–
10) Solid Waste Disposal	–	Increase in solid waste generation during the construction and post-construction phases. Also, increase in pressure on the Retirement Landfill at St. James to accommodate the additional waste.	–
11) Roads	Roads within the development area will be maintained and a main access road to the property will be constructed.	–	–
12) Health & Safety	Measures will be incorporated to ensure that health and safety are maintained as it relates to leachates from the graves.	Health and Safety of both employees and visitors may be at risk mainly during the Construction Phase especially if the necessary precautions are not taken.	▪ Cost to cover medical expenses for injured mourners/employees (cost depends on the severity of injury) ▪ Cost for Liability Insurance ▪ Cost for employee health Insurance – minimum of $1,000 monthly per employee

INDICATORS	SOCIO-ECONOMIC BENEFITS	SOCIO-ECONOMIC COSTS	MONETARY VALUE
			▪ Cost to implement Occupational Health & Safety Programme
13) Noise & Vibration	–	There will be an increase in noise levels and vibration during the construction period. The new high school may also experience an increase in noise levels as a result of funeral services and burials.	–

3.6.8 Management and Monitoring Plan

The operation of the cemetery will be monitored to ensure compliance with national environmental standards set by NEPA. The development impacts which require management and monitoring are outlined below.

A: Indicators, Targets and Agency/Individual Responsible

INDICATORS	TARGET	AGENCY/INDIVIDUAL RESPONSIBLE
A. Preparation & Construction Phases		
1. Aesthetics	Create an aesthetically pleasing site: - Marking of trees to be maintained for landscaping - Additional trees and plants required for the landscaping will be obtained.	Developer/Contractor
2. Air Quality	Reduce effects of increased particulate matter by: - Use of dust masks by employees to reduce effects - Use of water trucks to sprinkle property and roads.	Contractor
3. Health & Safety	Implement measures to reduce the risk of harm to health and safety.	Developer/Contractor
4. Noise	Reduce noise levels by: The use of ear muffs by employees	Developer
5. Solid Waste	Proper and timely disposal of solid waste (including construction waste) from the site.	Western Parks and Markets/Developer
6. Sewage Treatment Facility	Implement measures to prevent the sewage treatment facility from flooding and from odour nuisances. Construction of a sewage treatment facility, that produces treated wastewater of the quality that could be used for irrigating the lawn.	Engineer/Contractor/Parish Council /Project Engineer
7. Traffic Control	Reduce the conflict between pedestrian traffic and vehicular traffic. Reduce the accumulation of traffic through measures such as: use of flag men and the erection of signs.	Developer/Contractor
8. Building Plans	Ensure strict adherence to the approved building/development plans.	Westmoreland Parish Council/Contractor/ Developer
9. Flood Control Measures	Implement measures to: - prevent flooding of vaults and parking lot - protect roads from inundation.	Engineer/Contractor
10. Construction Materials	Obtaining construction materials from the nearest legitimate sources	Contractor/Westmoreland Parish Council /Project Engineer
B. Operational Phase		
1. Effluent Quality	Annual monitoring of effluent quality from waste water treatment plant based on NEPA/Ministry of Health guidelines and standards especially during the early stages of operation.	Developer/NWC

2. Public Amenities: Chapel	The construction of a chapel to seat 80 persons is proposed for the site.	Developer
3. Education of employees	Thorough education of employees: - the importance of proper waste management practices - the operation of sewage treatment plants.	NSWMA and Public Health Department
4. Potable Water	Potable water supply quality must be monitored monthly and maintained at a high standard.	NWC/Developer
5. Removal of trees	Institute penalties for the unwarranted removal/cutting of trees.	NEPA/Developer
7. Noise	Keep noise levels within recommended levels: - Carry out funeral services within acceptable hours - Comply with the Noise Abatement Act	Police/Developer
8. Solid Waste	Ensure a litter free park especially after funeral ceremonies.	Developer
9. Health and Safety	Provide appropriate safety equipment for staff, especially grave diggers.	Westmoreland Parish Council
10. Marine Water Quality	- limit the amount of sediments that may enter the coastal zone - ensure that sewage is treated	Developer

B: Monitoring Guidelines

ITEM	INDICATOR	PARAMETER	FREQUENCY	LOCATION
CONSTRUCTION/IMPLEMENTATION				
1	Effluent from temporary waste water facilities	pH, BOD, COD, TSS, TDS	Once every Month	-
2	Soil erosion and siltation	Soil erosion rate	Twice annually	-
OPERATION/MAINTENANCE				
1	Treated effluent from STP	pH, BOD, COD, TSS, TDS	Monthly	-
2	Soil erosion and siltation	Soil erosion rate	Every six months	-
3	Revegetation	Status of revegetation programme – landscaping (regrassing, planting of trees and ornamental plants) and crop cover.	Initially, monthly; later, annually	Open spaces, vegetation lining of property boundary.

CHAPTER 4 REGULATORY AUTHORITIES AND LEGISLATION

The regulatory frameworks within which the proposed project is to be developed are addressed below. The areas of relevance concern environmental quality, health and safety, protection of sensitive areas, protection of endangered species, site selection and land use control at the regional, national and local levels that relate to or should be considered within the framework of the project.

REGULATORY AUTHORITIES	DESCRIPTION
The National Environment and Planning Agency	Under the Natural Resources Authority Act and the Permits and Licenses Regulations of 1996, NEPA is responsible for environmental protection on the island. In discharging its responsibilities, NEPA is not only responsible for the environmental protection but also manages the nation's natural resources and enforces the environmental and development planning laws. Its functions include ensuring that developments are undertaken within its environmental guidelines by requiring Environmental Impact Assessments, reviewing proposed developments and granting permits and licences. Besides the NRCA Act, NEPA monitors and enforces laws and regulations such as The Beach Control Act, The Watershed Protection Act and the Wildlife Protection Act.
The Town and Country Planning Authority	This development falls under the Town and Country Planning Act of 1958 (amended 1993 and 1999) and the Local Improvements Act of 1944. The guidelines of the Westmoreland Parish Confirmed Development Order (1982) should generally be adhered to. These statutes control the development and subdivision of land. In such cases, normal procedures for building and development applications would be pursued by being channeled through the Westmoreland Parish Council and NEPA respectively.
The Ministry of Health	The Environmental Health Unit (EHU) of the Ministry of Health (MOH) is the agency responsible for the approval of the proposed sewage treatment and disposal system and setting the discharge limits and pollution control. The EHU would be responsible for reviewing the designs of the sewage treatment plant and the development plan for the cemetery.
The National Works Agency	Under the Ministry of Transportation and Works, NWA is responsible for reviewing the proposed development plan and ensuring that the drainage and road design meet the required standard. In essence, this means that the NWA will have to ensure that the surface drainage/storm war runoff generated from the site is effectively intercepted and disposed of and that the design for proposed main entrance road to the cemetery is safe.
National Water Commission	The NWC is responsible for potable water supply and sewerage services and will review the sewage disposal and water supply plans for the project and determine whether they should be approved.
Water Resources Authority	This government Agency is responsible for monitoring and ensuring the proper use of the surface and ground water resources of the island. The WRA is usually asked to review proposals for the development of a cemetery.
The Westmoreland Parish Council	The Westmoreland Parish Council is the local planning authority and has responsibility for the provision, management and regulation of certain public services including public health services, fire protection, abattoirs, cemeteries, street cleaning, parks and play fields and markets. The Parish Council is also responsible for solid waste disposal, however, Western Parks and Markets manages this. The Parish Council will give permission to construct the cemetery if the building plans meet the required standard.
Office of the Prime Minister (Local Government)	This ministry has responsibility for coordinating the functions of the local authorities such as the Parish Councils and the NSWMA.
National Land Agency	This government agency has the responsibility of managing all information as it relates to land (services) and would verify land ownership by the project proponent.

REGULATORY AUTHORITIES	DESCRIPTION
Urban Development Corporation	This government agency is responsible for urbanization in rural areas and would serve to ensure that the proposed development is sustainable.
Jamaica National Heritage Trust	This agency is responsible for the preservation of monuments, art, botanical and animal life, and anything designated as protected national heritage for the benefit of the island.
Office of Disaster Preparedness and Emergency Management	This Government agency's overarching responsibility is disaster risk reduction through its hazard preparedness and mitigation measures.

RELEVANT LEGISLATION	DESCRIPTION
The Natural Resources Conservation Authority (NRCA) Act, 1991	The NRCA Act (1991) is the overriding legislation governing environmental management in Jamaica. It requires that all new developments (or expansion of existing projects) which involve the sub-division of ten (10) or more lots be subject to EIA. The regulations require that fifteen (15) copies of the EIA Report be submitted to the Authority for review. Therefore a preliminary review period of ten (10) days is required to determine whether additional information is needed. After the initial review, the process can take up to ninety (90) days for approval. If on review and evaluation of the EIA the required criteria are met, a permit is granted. In the event that the EIA is not approved, there is provision for an appeal to be made to the Minister. Specifically, the relevant section(s) under the Act that addresses the proposed project are: Section 10: Empowers the Authority to request EIAs for the construction of any enterprise of a prescribed category. Section 12: Addresses the potential for contamination of ground water by trade effluent and sewage. Section 15: Addresses the implementation of stop orders and fines associated with the pollution of water resources. Section 16: Authorizes the government to intervene in order to prevent the contamination of ground water. Section 17: Addresses the authority of the government to request in writing, any information pertaining to the: - performance of the facility - quantity and condition of the effluent discharged - the area affected by the discharge of effluent.
Natural Resources Conservation (Permits and License) Regulation, 1996	▪ Water treatment facilities including sewage and industrial wastewater require permits. ▪ Regulation 8 sets out the application process for obtaining a license to discharge pollutants ▪ Regulation 9 empowers the NRCA to require owners for operators of existing facilities to upgrade their facilities to the "current standards applicable to new facilities" within a specified time
The Beach Control Act, 1956	The Beach Control Act which is administered by NEPA provides for regulation within 25m of the shoreline. It includes control of construction of sheds and huts on beaches and prohibits the use of public beaches for fishing activities and requires that a license be granted for use of the foreshore. Section 5 – (1) From and after the 1st June, 1956, no person shall encroach on or use, or permit any encroachment on or use of, the foreshore or the floor of the sea for any public purpose or for or in connection with any trade or business, or commercial enterprise, or in any other manner (whether similar to the foregoing or not) except as provided by sections 3, 4 and 8, without a licence granted under this act.

RELEVANT LEGISLATION	DESCRIPTION
	The act, however, grants rights to use of the foreshore if that area was previously being utilized by the public. Section 14 – (2) Where the public or any class of the public have used any beach, land, road, track or pathway in the manner and for the period specified in section four (4) subsection (1) of the Prescription Act and such user is not disputed, the Authority may, if they think expedient so to do, make an application to the Supreme Court by motion for a declaration of the right of the public to use such beach, land, road, track or pathway, and the Court, upon being satisfied that the user is not disputed, shall have power to make order as the such Court may think fit.

RELEVANT LEGISLATION	DESCRIPTION
The Prescription Act, 1882	Section 4.-(1) When any beach has been used by the public or any class of the public for fishing, or for purposes incident to fishing, or for bathing or recreation, and any road, track or pathway passing over any land adjoining or adjacent to such beach has been used by the public or any class of the public as a means of access to such beach has been used by the public or without interruption for the full period of twenty years, the public shall, subject to the provisos hereinafter contained, have the absolute and indefeasible right to use such beach, land, road, track or pathway as aforesaid, unless it shall appear that the same as enjoyed by some consent or agreement expressly made or given for that purpose by deed or writing.
The Watershed Protection Act, 1963	This Act governs the activities operating within the island's watersheds, as well as protects these areas. The watershed designated under this Act is the Deans Valley River Watershed Management Unit.
The Public Health Act, 1974	This Act falls under the ambit of the MOH. Provisions are also made under this Act for the activities of the Environmental Health Unit (EHU), a division of the MOH. The EHU has no direct legislative jurisdiction, but works through the Public Health Act to monitor and control pollution from point sources. The Central Health Committee would administer action against any breaches of this Act. In addition, there are various sections of this legislative instrument that govern and protect the health of the public. Relevant sections under the Public Health Act of 1985 are: Section 7 - (1) A local Board may from time to time, and shall if directed by the Minister to do so, make regulations relating to nuisances and, Section 14 - (1) The Minister may make regulations generally for carrying out the provisions and purposes of this Act, and in particular, subject to Section 7 but without prejudice to the generality of the foregoing, may make regulations in relation to air, soil and water pollution.
The National Solid Waste Management Act, 2001	The Regulatory Agency, NSWMA will be responsible for the implementation of the National Solid Waste Management Act. In Part II Section 4-1 the Authority shall – (a) Take all such steps as are necessary for the effective management of solid waste in Jamaica in order to safeguard public health, ensure that waste is collected, stored transported, recycled, reused or disposed of, in an environmentally sound manner and promote safety standards in relation to such waste;" In Section 23 – (i) Every person who: a. Operates or propose to operate a solid waste disposal facility: b. Provides or proposes to provide solid waste collection or transfer service; or c. Otherwise manages solid waste, "Shall apply in the prescribed form and manner to the authority for the appropriate licence." Part V Section 42 – (i) 7. The Authority may provide the occupier of any premises, on his request, with receptacles to be used for: a. Compostable waste which is to be recycled b. Non - compostable waste which is to be recycled; or c. Waste which is not to be recycled" Subject to subsection (4), the Authority may, in relation to a request for receptacles: a. Where possible, provide them free of charge; or b. Provide them at such cost, and on such terms as to payment, as may be agreed with the occupier. Part VII Section 45 - Every person who - a. Disposes of solid waste in any area or in any manner not approved by the authority; b. Operate a solid waste disposal facility, provide solid waste collection or transfer service or otherwise manages solid waste, without a valid licence or operating certificate under this Act or any regulation hereunder; commits an offence and shall be liable on summary conviction before a Resident Magistrate to a fine not exceeding one million dollars or to imprisonment for

RELEVANT LEGISLATION	DESCRIPTION
	a term not exceeding nine months or to both such fine and imprisonment. The NSWMA is the public authority responsible for solid waste management in Jamaica, under the National Solid Waste Management Act, 2001. This includes provision for environmentally sound waste collection, transportation, re-use and recycling, and the establishment of a licensing system for operators of solid waste management facilities and collection systems. The permit issued to the applicant stipulated that the developer had the responsibility to dispose solid waste from the facility at an NSWMA approved disposal site.
The Wildlife Protection Act , 1945	The Wildlife Protection Act of 1945 is administered by NEPA and provides regulation for the protection and conservation of animals, birds and fishes.
Jamaica National Heritage Trust Act, 1985	The Jamaica National Heritage Trust Act of 1985 established the Jamaica National Heritage Trust (JNHT). The trust's functions include the following responsibilities: • To promote the preservation monuments and anything designated as protected national heritage for the benefit of the land; • To carry out such development, as it considers necessary for the preservation of any national monuments or anything designated as protected national heritage; • To record any precious objects or works of art to be preserved and to identify and record any species of botanical or animal life to be protected. Section 17 further states that it is an offence for any individual to: • Willfully deface, damage or destroy any nati onal monuments or protected national heritage or to deface, damage destroy, conceal or remove any mark affixed to a national monument or protected national heritage; • Alter any national monuments or mark without the written permission of the Trust; • Remove or cause to be removed any national monument or protected national heritage to a place outside Jamaica.
Town and Country Planning Act, 1958	The Town and Country Development (Westmoreland) Confirmed Development Order, 1982 falls under this Act and guides physical development in the Parish. Section 5 of the Town and Country Planning Act authorizes the Town and Country Planning Authority to prepare, after consultation with any local authority, the provisional development orders required for any land in the urban or rural areas, so as to control the development of land in the prescribed area. In this manner, the Authority will be able to coordinate the development of roads and public services and conserve and develop the resources in the area. Any person may, under Section 6 of the Act, object to any development order on the grounds that it is: • impractical and unnecessary; • against the interests of the economic welfare of the locality. However, if the Minister is satisfied that the implementation of the provisional development order is likely to be in the public interest, he may, under Section 7 (2) of the Act, confirm it with or without modification by publishing a notice in the Gazette. Section 8 of the Act also gives the Minister the authority to amend a confirmed development order. Section 10 of the Act states that a development order must include: • clearly defined details of the area to be developed; • regulations regarding the development of the land in the area specified; • formal granting of permission for the development of land in the area. If the provisions of section 9A of the Natural Resources Conservation Authority (NRCA) Act apply to the development, the application can only be approved by the Planning Authority after the NRCA has granted a permit for the development. (Section 11 (1A). The Authority may impose a "tree preservation order" under Section 25 of the Act if it considers it important to make provision for the preservation of trees and woodlands in the area of the development.
Town and Communities Act, 1843	The Town and Communities Act of 1843 governs the code of conduct in communities.

RELEVANT LEGISLATION	DESCRIPTION
The Local Improvements Act	The subdivision of land throughout Jamaica is regulated under this Act. The Act stipulates that all subdivision of land for building or sale throughout Jamaica requires the permission of the local planning authority of the parish in which the land is located. The Act requires that the comments of the Chief Technical Director be obtained prior to the applicant being notified of the Parish Council's decision. By virtue of an amendment in 1959 the expert advice of the Government Town Planner is also required by the local authority prior to notification of applicants.
The Clean Air Act, 1964	The Central Health Committee regulates air emissions of any noxious or offensive gases and dust from a premise. This Act lists seven categories of dust and noxious gases, including air emissions from the following works: alumina, cement, lime, sulphur from petroleum processing, gypsum, and sugar factories. With the exception of cement that will be used in the construction phase of this development, the project does not include any of these activities in its construction or operational phase.
The Noise Abatement Act, 1997	The Noise Abatement Act, 1997 is the main legislation for the control of noise in Jamaica. Section 3 of this Act prohibits persons in private or public places from operating amplification devices in such a way that could cause a nuisance to persons in the vicinity.
The Water Resources Act, 1995	The Water Resources Authority (WRA) administers the Water Resources Act 1995, which regulates the allocation and preservation of water resources in Jamaica.

INTERNATIONAL STANDARDS, AGREEMENTS & CONVENTIONS	DESCRIPTION
Agenda 21	This is an international programme developed at the United Nations Conference on the Environment and Development which provides proposals for the work on sustainable development on all areas of society. This programme, however, is not legally binding.
Convention on Biological Diversity	This convention is concerned with the protection and sustainable use of the world's biological diversity and equitable sharing of the benefits arising from the sustainable use of heritable resources.
Rio's Forest Principles	This document promotes sustainable forest management. The Intergovernmental Forum on Forests (IFF) implements the forest principles. Similar to Agenda 21, this document is not legally binding.
Habitat Agenda	This programme promotes sustainable development in urban areas and contains a global action plan for the sustainable development of cities.
The World Health Organization (WHO) (Ucisik and Rushbrook), 1998	WHO has established guidelines for siting cemeteries: 1. Human or animal remains must not be buried within 250 m of any well, borehole or spring from which a potable water supply is drawn. This distance may be greater if the site has a steep hydrogeological gradient or the velocity of groundwater flow within an aquifer is rapid. 2. The place of interment should be at least 30 m away from any other spring or watercourse and at least 10 m from any field or drain. 3. All burial pits on the site must maintain a minimum of one metre of subsoil below the bottom of the burial pit (i.e. the base of the burial must be at least one metre above solid rock). 4. The base of all burial pits on the site must maintain a minimum of one metre clearance above the highest natural water table. (Any variability in the water table should be taken into account.) 5. Burial excavations should be backfilled as soon as the remains are interred, providing a minimum of one metre soil cover at the surface.

APPENDICES

APPENDIX I

TERMS OF REFERENCE

TERMS OF REFERNECE

ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED MOUNT EDGECOMBE CEMETERY, MOUNT EDGECOMBE/BELMONT, WESTMORELAND

1. INTRODUCTION

The introduction will describe in general terms the reason for the Environmental Impact Assessment. The guidelines prepared by the National Environment and Planning Agency and the recommendations from the Agency's scoping exercise will be included in this section. A synopsis of the development will also be included in this section and the location where the report will be made available for viewing.

a. Description of the purpose of the report including:
   - identifying the project and its proponents
   - a synopsis of the nature, size and location of the project and its importance

b. Stage of the project preparation – feasibility study or detailed engineering design preparation.

c. Extent of the EIA study, including scope of study based on NEPA guidelines and the Agency's scoping exercise, magnitude of effort, and persons/expertise for performing the study.

d. Brief outline of contents of the report, including any special techniques or methods used for identifying issues, assessing impacts, and designing environmental protection measures.

2. SCOPE OF WORK

Task 1: Identify the Legislative and Regulatory Framework

The relevant regulatory framework and international agreements within which this development would be pursued would be outlined in terms of responsibilities and relevance to the process. They would include the following:

Legislations
The Town and Country Planning, Westmoreland Parish (Confirmed) Development Order, 1978
The Town and Country Planning Law, 1957 (amended 1987)
The Town and Country Planning Act, 1958
The Natural Resources Conservation Authority Act, 1991
The Towns and Communities Act, 1843
The Natural Resources Conservation (Permits and Licenses) Regulation, 1996
The Jamaica National Heritage Trust Act, 1985
The Wildlife Protection Act, 1945 (amended 1998)
The Public Health Act, 1974
The Clean Air Act, 1964
The Noise Abatement Act, 1997
The Watershed Protection Act, 1882
The National Solid Waste Management Act, 2001

Authorities would include:
Westmoreland Parish Council
The Westmoreland Parish Development Committee
The National Environment and Planning Agency
Office of the Prime Minister (Local Government)
The Ministry of Health
National Land Agency
Water Resources Authority
The Jamaica National Heritage Trust
Office of Disaster Preparedness and Emergency Management
The National Works Agency

International Agreements
Agenda 21
Convention on Biological Diversity
Habitat Agenda

Task 2: General Description of the Project

The project's description would incorporate the basic project activities, location, layout and schedule (in terms of project cycle). The following would be included:

- Type of project
- Need for project
- Location (using maps to illustrate general and specific location, project boundary and project site layout)
- Size/magnitude of operation including any associated activities required by or for the project
- Description of the project including drawings showing project layout, components of project, etc.
    - maps, design plans and photographs
    - purpose and justification
    - alternatives to the proposed project
    - how the project relates to the existing conditions
    - public utility requirements - sewerage, water, electricity – in short to long term
    - site preparation
    - scheduling of development activities, methods, materials
    - waste disposal associated with the project
    - measures to protect the coastline and the coastal waters
- Proposed burial process and methodology

Task 3: Description of the Environment

The description of the study area would provide a clear picture of the existing environmental resources within which the impacts must be considered. Where applicable, methodology used in gathering information, including data sources will be included, in addition to presenting baseline information in maps, figures, and tables. The baseline environmental information will include:

1. Physical Resources
    - atmosphere (e.g. air quality, prevailing winds)
    - topography and soils

- flood impact assessment to include hydrology – flooding history, rainfall, drainage
- groundwater – levels, quality, flow direction etc.
- geology/seismology – lithology, faults, landslides etc.
- climate

In describing the physical resources special emphasis will be placed on the following:

Water Supply - Demand Balance Analysis
Water demand for the general area will be assessed based on population data and consumption rate for the various demand sectors (domestic, industrial and agricultural) in the general area. The present and projected water demand will be compared with the existing supply in the general area. The result of this analysis will determine the additional quantity of water required and the source development options if necessary.

Storm Water Runoff
Storm water runoff to and from the site will be assessed using the Rational Method. Storm water runoff will be assessed for return periods of 5, 10 and 25 Years in order to provide information useful in the engineering design of hydraulic structures (drains, culverts, etc) on and adjacent to the site.

Groundwater Pollution Risk Analysis
The risk of groundwater pollution as a consequence of the development will be assessed based on analysis of groundwater depth, lithology and percolation rate, the method used to seal the vaults and the efficiency of a tertiary sewage treatment and disposal system to be introduced at the site.

The variations in soil definition will be assessed and in situ percolation tests conducted.

The travel time of any fluids emanating from the vaults to the ground water will be projected and analysed.

Coastal Zone Management Issues
The effects of the proposed activities and geomorphological forces of wind and tides on the character of the coastal areas will be assessed. The activities currently being conducted along the coastal area will be outlined (e.g. fishing).

2. Ecological Resources
   - wildlife
   - rare or endangered species
   - protected areas
   - coastal resources
   - fisheries
   - nocturnal species

The ecological assessment of the existing natural communities found at the proposed site of the proposed cemetery will be conducted as follows:

Survey of Flora

Community classifications will be based on the dominant plant types and substrates that compose them. Field investigations will also include community structure, primary and secondary human disturbances and fauna and flora identification.

Survey of Fauna

The fauna will be surveyed by either direct observation or searching for indicators, such as burrows, tracks, and observation of wetlands and the coastal environment. Species and indicators encountered on the site proposed for development will be reported. The physical and vocal characteristics of species, which cannot be immediately identified, will be described in detail for further verification.

3. Social, Cultural and Economic Resources
   - population and communities (e.g. numbers, locations, age/sex composition, employment)
   - death rate
   - religious (burial) practices
   - health facilities
   - socio-economic conditions (e.g. family structure, social well being)
   - physical or cultural heritage
   - use of lands and resources (past and present)
   - structures or areas that are of historical significance
   - industries
   - infrastructure facilities (e.g. water supply, sewerage, flood control)
   - transportation – traffic flow
   - power sources and transmission
   - burial spaces within the parish

Socio – economic Survey

A survey will be conducted among residents in adjacent areas (within a 1.5 km radius of the proposed site) covering housing and population, employment and economy, social services and physical infrastructure and awareness of the proposed development and community concerns. Any trade – offs that the community is willing to make in order for the development to succeed will be highlighted.

A land use survey will identify management practices, such as, compatible and incompatible uses and existing and proposed uses. The project will be analyzed under the guidelines of the Town and Country Planning Act (1987) and the Development and Investment Manual Development Manual (Volume 1, Section 1 (Planning and Development) and Volume 2 Section 1 (Environment). Cultural practices will also be investigated.

Task 4: Identify Alternatives

Feasible alternatives for the proposed project site, technology, and operational alternatives will be compared in terms of their potential environmental impacts, costs, suitability under local conditions, and monitoring requirements.

Task 5: Public Community Participation

In an effort to ascertain the publics' input in the proposed development, various stakeholders will be contacted. As such this section will:

(i) describe the process undertaken to involve the public
(ii) summarize major comments received from stakeholders such as, local officials, community leaders, NGOs, and others, and describe how these comments were addressed
(iii) summarize public acceptance or opinion on the proposed cemetery
(iv) describe other related materials or activities (e.g., press releases, notifications) as part of the effort to gain public participation.

Task 6: Potential Environmental Impacts and Mitigation Measures

Any impacts to the ecosystem components as a result of the project during the construction and the operational phases will be noted and mitigation measures recommended where necessary. Potential environmental impacts to be investigated would include those due to project location, project design, construction and regular operations. These impacts and those off-site will be quantified where possible.

The identification of impacts will focus on the following areas:

a. Wildlife (avi-fauna) and vegetation – any obvious change in species composition and distribution, habitat change/fragmentation, displacement, corridor impairment, endemic, endangered and nocturnal species.
b. Landform – physical changes, for example coastline changes, erosion potential of site, features of special interest.
c. Flooding and drainage considerations including impact on and of adjacent properties. The impact of the 1979 flood rains on the site would be referenced.
d. Waste Disposal – solid waste disposal and sewage disposal methods – on site and potential impact on surface, groundwater and marine resources.
e. Landscaping – effects of landscaping on flora and fauna
f. Marine life – changes in species composition and distribution, endangered and endemic species.
g. Pollution – contamination of soil and water resources e.g. from leachate and air quality e.g. increase in particulate matter resulting from ground preparation services.

Impact mitigation will focus on design elements, alternative construction techniques and long-term operational practices.

Task 7: Potential Social Impacts and Mitigation Measures

Potential social impacts as a result of the project during the construction and the operational phases will be noted and mitigation measures recommended. The potential social impacts would include those associated with the project location, construction and operational phases. These impacts and those off-site will be quantified where possible.

The identification of social impacts will focus on areas such as:

a. Public health and safety – any impacts to employees and mourners as a result air quality (noise and particulate matter) and ground preparation activities
b. Traffic levels – the potential for increased road accidents during funeral processions
c. Aesthetics – the effects of the cemetery on the visual character of the main road and the surrounding property.
d. Displacement of the adjacent Bluefields All–Age School
e. Coastal Environment – potential for impacts on coastal activities, such as recreational bathing, fishing, etc.

Cumulative Impacts – Changes within the area over time because of the project along with those being experienced from existing site activities would be noted.

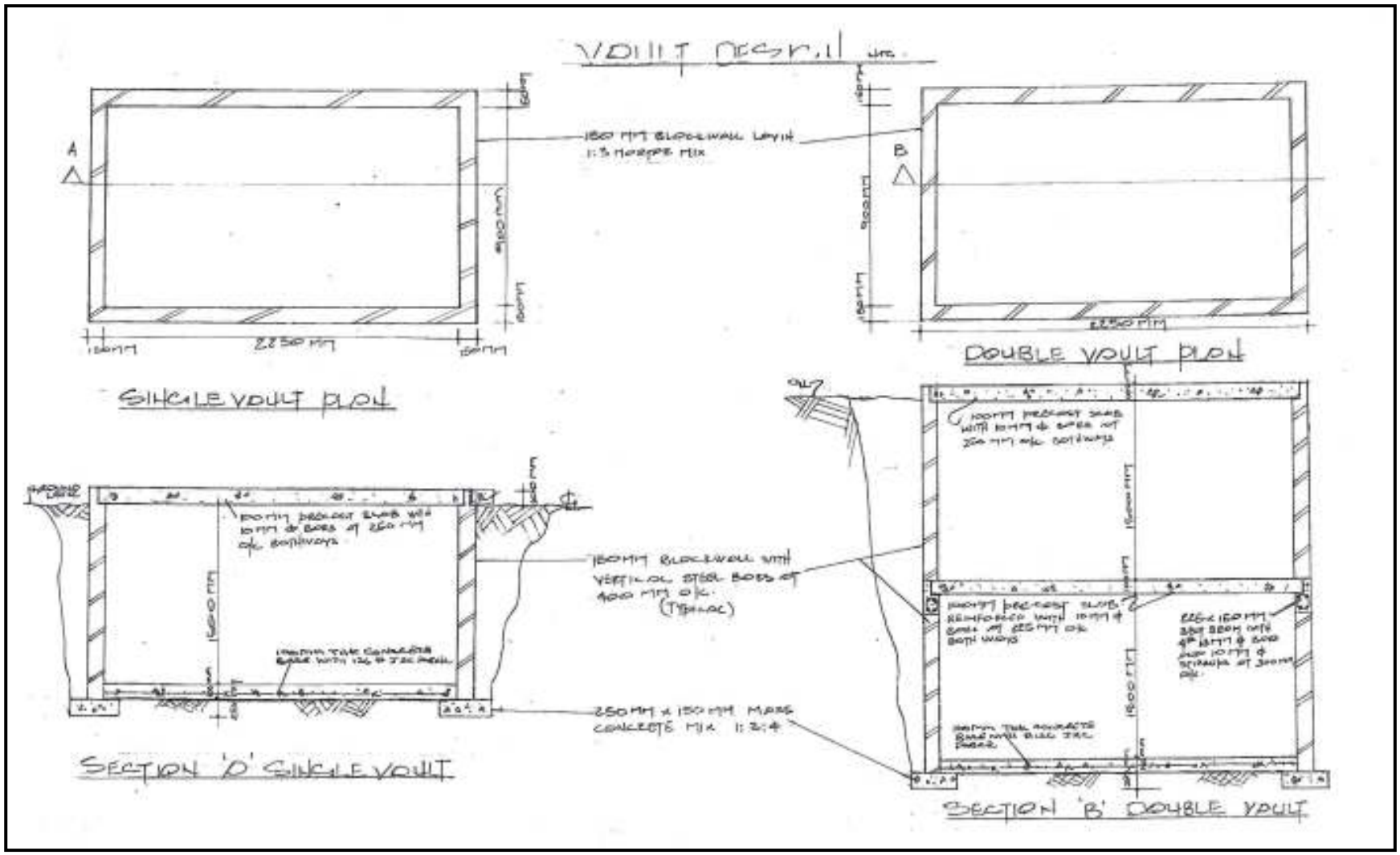
Residual Impacts – Given the mitigation measures recommended, environmental changes that may result from project implementation would be described.

Task 8: Monitoring and Management Plan

Areas for monitoring during and after the construction phase will be identified. Follow – up activities will be recommended where necessary. The responsible persons/agencies will be identified.

APPENDIX II

VAULT DESIGN


VAULT DESIGN
A
B
150 MM BLOCKWALL LAYIN
1:3 MORTAR MIX
2250 MM
SINGLE VAULT PLAN
DOUBLE VAULT PLAN
150MM BLOCKWALL WITH
VERTICAL STEEL BARS AT
400 MM O/C.
(TYPICAL)
250 MM x 150 MM MASS
CONCRETE MIX 1:2:4
SECTION 'D' SINGLE VAULT
SECTION 'B' DOUBLE VAULT

APPENDIX III

QUESTIONNAIRE

SOCIO-ECONOMIC SURVEY

PROPOSED MOUNT EDGECOMBE CEMETERY MOUNT EDGECOMBE/BELMONT, WESTMORELAND

Community_____ **ED Code**_____
Interviewer_____ **Date**_____

DEMOGRAPHIC STATISTICS

1. Gender
   a. Male [ ] b. Female [ ]

2. How long have you lived in the area?
   a. 1-5 yrs. [ ] b. 6-10 yrs. [ ] c. Above 10 yrs. [ ]

3. Are you the head of the household?
   a. Yes [ ] b. No [ ]

4. How many persons occupy your household?
   a. 1 - 3 [ ] b.4 – 6 [ ] c. 7 + [ ]

5. In what age range do you fall?
   a. 16-25 [ ] b. 26-36 [ ] c. 37-47 [ ] d. 48-58 [ ] e. 60 and above [ ]

6. Is your house
   a. Owned? [ ]
   b. Rented? [ ]
   c. Leased? [ ]
   d. Other _____

7. What is your occupation? _____

8. What is your monthly salary?
   a. Less than $20,000 [ ]
   b. $20,000 - $49,000 [ ]
   c. $50,000 - $99,999 [ ]
   d. $100 000 and over [ ]

9. What type of school did you last attend?
   a. Primary [ ]
   b. All age [ ]
   c. Junior High [ ]
   d. Secondary [ ]
   e. High [ ]
   f. Tertiary [ ]
   g. Other, please specify_____

QUALITY OF LIFE IN COMMUNITY

10. What is the main source of drinking water for your household?

    a. Indoor tap/pipe [ ]
    b. Outside private tap/pipe [ ]
    c. Public standpipe [ ]
    d. Well [ ]
    e. River, lake, spring, or pond [ ]
    f. Rainwater tank [ ]
    Other, please specify _____

11. If your household receives piped water from NWC, what do you believe is the source of the water?

    a. Spring, please specify_____ [ ]
    b. River, please specify_____ [ ]
    c. Groundwater wells [ ]
    d. Other, please specify _____ [ ]

12. How do you get rid of your household's garbage

    a. Collected by garbage truck [ ]
    b. Burn [ ]
    c. Dumped in empty lot [ ]
    d. Dumped in gully [ ]
    e. Other, please specify _____

13. Do you have problems with any of the following public services? Please indicate Y for Yes and N for No

Health care [ ]	Electricity supply [ ]	Police [ ]
Garbage collection [ ]	Schools [ ]	Postal services [ ]
Water supply [ ]	Transportation [ ]	Fire services [ ]
Road maintenance [ ]	Other, please specify: _____	

AWARENESS OF PROPOSED DEVELOPMENT

14. Where did you first learn about this proposed cemetery development?

    a. This interview [ ]
    b. Communication from the developers [ ]
    c. Communication from the government [ ]
    d. Newspaper article [ ]
    e. Television or radio news [ ]
    f. Word of mouth (friend or neighbour) [ ]
    g. Communication from the an organization or group, please specify_____
    _____

15. What is your impression of the cemetery

    a. Positive [ ] b. Negative [ ]

16. On a scale of 1-10, with 1 being the least and 10 being the greatest, how concerned are you about the environmental effects of the proposed development? [ ]

17. What are your specific concerns about the environmental effects of the cemetery?

    a. Water supplies will be negatively affected. [ ]
    b. Negative effects on public health. [ ]
    c. Unpleasant odours [ ]
    d. Negative effects on crops [ ]
    e. Increased flooding in the area [ ]
    f. Conflict/competition between locals and new comers for the jobs [ ]
    g. Property values will be lowered [ ]
    h. Ghosts [ ]
    i. Nuisances during construction (e.g. noise, dust etc.) [ ]
    j. Traffic congestion along the main road [ ]
    k. Unsuitable location (incompatible with nearby land uses) [ ]

18. Do you perceive any benefits of this project?

    a. Yes [ ] b. No [ ]

    If yes, choose from the following

    a. Employment opportunities [ ]
    b. Community resources [ ]
    c. Security [ ]
    d. Business opportunities [ ]
    e. Increased visitors to the area [ ]
    f. Development of under-utilized land resources [ ]
    g. Other, please specify_____

19. What is your/the community's preferred location /form of burial?

    b. Family plot [ ]
    c. Cemetery [ ]
    d. Graveyard (church grounds) [ ]
    e. Cremation [ ]

20. Are you aware of any other cemeteries, graveyards or burial plots in this community?

    a. Yes [ ] Please specify_____
    b. No [ ]

APPENDIX IV

QUESTIONNAIRE RESULTS

Gender		
Male	67%	
Female	33%	
Total	100%	
How long did u live in area?		
1-5 yrs	17%	
6-10 yrs	1%	
above 10 yrs	82%	
Total	100%	
Head of household		
Yes	64%	
No	36%	
Total	100%	
Persons occupying Household		
1-3 persons	53.6%	
4-6 persons	34.8%	
Over 7 persons	11.60%	
Total	100.0%	
Age Range		
16-25	20%	
26-36	28%	
37-47	23%	
48-58	12%	
60 and over	14%	
No Response	3%	
Total	100%	
House tenure		
Owned	93%	
Rent	6%	
Leased	1%	
Other	0%	
Total	100%	
What is your occupation?		
Self-employed	10	14%
Farmer	5	7%
Mason	5	7%
Fish Vendor	6	&%
Fisherman	4	6%
Labourer	5	7%
Business man/woman	5	7%
Other	20	44&
What is your monthly salary?		

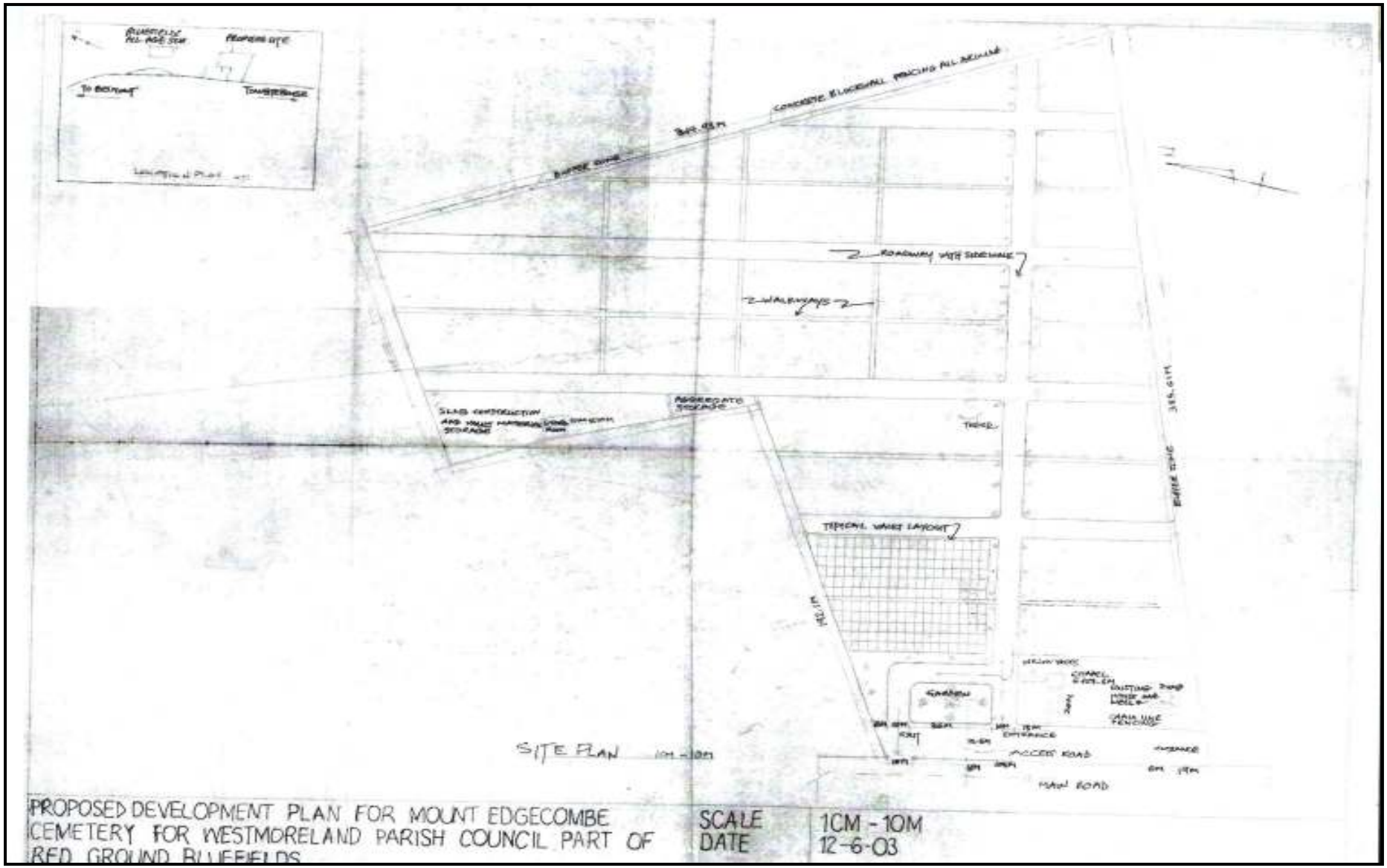
Less than $20,000	46%	
$20,000-$49,000	28%	
No response/ Not applicable	25%	
Total	100%	
Indicate level of education		
Primary	6%	
All Age	38%	
Junior High	4%	
Secondary	9%	
High	20%	
Tertiary	13%	
Other	9%	
No response	1%	
Total	100%	
What is main source of drinking water for household?		
Indoor tap/pipe	33	45%
Outside private tap/ pipe	6	8%
Public stand pipe	2	3%
River, Lake,Spring, Pond	25	35%
Rainwater tank	6	8%
Other	1	1%
Total	73	100%
What do you believe is the source of water?		
Spring		0%
River		83%
Well		0%
Groundwater		1%
Other		16%
Total		100%
How do you dispose of household garbage?		
Collected by garbage truck	38	52%
Burn	26	36%
Dumped in empty lot	7	10%
Dumped in gully	0	0%
Other	2	3%
Total	73	100%
Do you have problems with any of the following public services?		
Health Care	2	2%
Garbage collection	25	28%
Water supply	33	37%
Road Maintenance	6	7%
Electricity supply	7	8%
Schools	1	1%
Transportation	0	0%

Police	2	2%
Postal services	1	1%
Fire services	2	2%
No response	11	12%
Total	90	100%
Where did you first learn about this proposed cemetery development?		
This interview	14	19%
Communication from developers	4	5%
Communication from government	7	10%
Newspaper article	0	0%
Television or Radio	3	4%
Word of mouth (friend or Neighbour)	37	51%
Communication from an organization or group	8	11%
Total	73	100%
What is your impression of the cemetery?		
Positive	55%	
Negative	44%	
No response	1%	
Total	100%	
How concerned are you about the environmental effects of the proposed development?		
1	4%	
2	1%	
3	3%	
4	7%	
5	1%	
6	1%	
7	6%	
8	4%	
9	6%	
10	35%	
No response	30%	
Total	98%	
What are your specific concerns about the environmental effects of the cemetery?		
Water supply will be negatively affected	17	13%
Negative effects on public health	20	16%
Unpleasant odours	13	10%
Negative effects on crops	7	5%
Increased flooding in the area	5	4%
Conflict/ competition between locals and newcomers for jobs	3	2%
Property values will be lowered	6	5%
Ghosts	8	6%
Nuisance during construction	4	3%

Traffic congestion along the main road	4	3%
unsuitable location (incompatible with nearby land uses	37	29%
No response	5	4%
Total	129	100%
Do you perceive any benefits of the project?		
Yes	55%	
No	45%	
Total	100%	
Perceived benefits from this project		
Employment opportunities	28	49%
Community resources	5	9%
Security	1	2%
Business Opportunities	13	22%
Increased Visitors to the area	3	5%
Development of under- utilized land resources	5	9%
Other	1	2%
No response	1	2%
Total	57	100%
What is your/ the community preferred location /form of burial?		
Family plot		
Cemetery		
Graveyard (church grounds)		
Cremation		
Total		
Are you aware of any other cemeteries, graveyards or burial plots in this community?		
Yes		86.95652
No	87%	
No Response	6%	

APPENDIX V

SITE PLAN


SITE PLAN
PROPOSED DEVELOPMENT PLAN FOR MOUNT EDGECOMBE CEMETERY FOR WESTMORELAND PARISH COUNCIL PART OF RED GROUND BLUEFIELDS
SCALE 1CM - 10M
DATE 12-6-03
MAIN ROAD