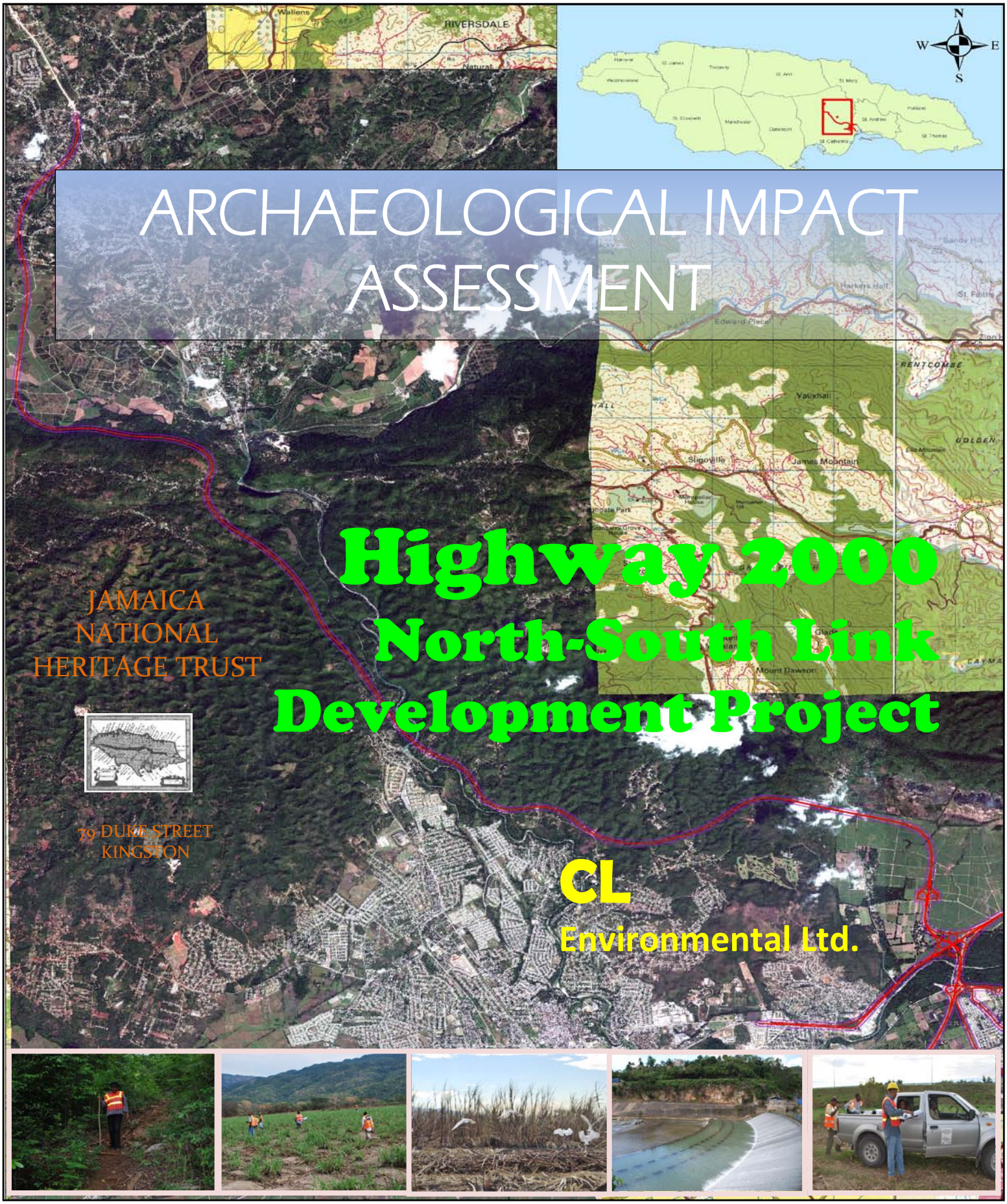
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Highway 2000
North-South Link
Development Project
JAMAICA NATIONAL HERITAGE TRUST
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CL
Environmental Ltd.

ARCHAEOLOGICAL IMPACT ASSESSMENT

Highway 2000 North-South Link Development Project

March-April 2012
For

CL
Environmental Ltd

Prepared by
JAMAICA NATIONAL HERITAGE TRUST
ARCHAEOLOGY DIVISION
FIELD UNIT

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Glossary

Archaeological Appraisal	It is an archaeological reconnaissance of an area or site to identify whether a development proposal has a potential archaeological dimension requiring further investigation.
Archaeological Impact Assessment	Archaeological Impact Assessment (AIA) is a systematic analysis of a project / development potential effect on all aspects of the material cultural heritage, in order to provide information for the deciding agency to consider in the decision-making process, and further give bodies with relevant environmental responsibilities the opportunity to comment before consent is given or denied.
Artefact	An object produced or shaped by human craft especially a tool, weapon or ornament of archaeological or historical interest
Desk-based Assessment	This is an assessment of the known or potential archaeological resources within a specified area or site on land or underwater, consisting of a collection of existing written and graphic information in order to identify the likely character, extent, quality and worth of the known or potential archaeological resources in the local, regional, national or international context as appropriate.
Evaluation	A limited programme of non-intrusive and/or intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site, and if present defines their character and extent, and relative quality. It enables an assessment of their worth in a local, national, regional or international context as appropriate
In situ	In its original position or place (Original deposition of artefact)
Midden	The term refers to a Taíno refuse heap near dwelling
Mountains	During the period of slavery the production of food for local consumption took place in gardens attached to plantation Great Houses and workers' houses, in provision grounds located within the plantation boundaries, and in separate units of land called mountains. Where the land within a

	plantations boundaries was all suited to the cultivation of export crops, planters acquired blocks of land in the surrounding uplands to supply timber and create provision grounds for their slaves. Such units were commonly called "mountains". Most mountains were less than 16 km (10 miles) distant from the plantations but in some cases they were much further away. After emancipation the mountain lands were often the first areas of plantation lands to be subdivided for sale.
Pens	Enclosure for animals, farm or gentleman's estate. Pens were types of estates which produced livestock and foodstuff for the local markets, but supplemented their income by the growing of pimento, cotton, logwood for export. Working cattle, horses, asses and mules were all raised for sale to estates and plantations where they were used to power mills and transport goods and people. Pens also purchased worn out cattle from estates and plantations and fattened them for the local market
Petroglyph	Rock carvings, especially pre-historic
Pictograph	Rock paintings
Slipware	Staffordshire Slipware originated in England. They have a date range of 1670-1795
Taíno	Indigenous people inhabiting Jamaica from around AD 650 into the seventeenth century. It is estimated that some 60,000-600,000 Taíno lived in Jamaica at the arrival of the Spaniards. Taíno communal villages were distributed throughout the island; the majority, however, were situated near water, by the coast and in the interior mountains adjacent to rivers, creeks and other sources of water.

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Basil Cox	Cross Pen	345-6145
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B. Boothe	Giblatore	
Orlando Williams	Giblatore	

NON-TECHNICAL SUMMARY

S.1 The Jamaica National Heritage Trust (JNHT) has concluded an Archaeological Impact Assessment (AIA) on the proposed segment of Highway 2000 North–South Link. The proposed highway runs from Caymanas to Byndloss. The AIA field survey was scheduled to be conducted within a three day period but because of rain and difficulties in accessing some areas in the hilly terrain the field survey actually was done in three and a half days March 21-23 and April 16, 2012.

S.2 This Archaeological Impact Assessment was carried out in response to a request made by CL Environmental Ltd.

S.3 The research objectives of the assessment are to ascertain the presence of historical and archaeological resources and describe the status of these resources, along with any other socio-economic attributes and appraise their worth in context of the proposed development, legislative and regulatory considerations. In addition, to identify and predict any potential positive, negative, reversible, irreversible, short and long term impact and to indicate possible mitigation to negative impacts, as well as recommendations to enhance positive impacts, also to outline possible alternatives to the project and/or aspects of it. Where necessary indicate suitable management and monitoring plan for the earth breaking stage of the project.

S.4 There are a number of pertinent policies, legislation, regulations and environmental standards of the Government of Jamaica (GOJ) relating to environmental protection that are applicable to any development and that a developer will need to consider when embarking on a particular scale and type of development. There are several government agencies mandated with the authority to control certain types of development that may have potential negative impact on the natural and cultural environment. These are Natural Resources Conservation Authority, National Environment and Planning Agency, Parish Council, The National Solid Waste Management Authority, National Land Authority, Ministry of Health and the Jamaica National Heritage Trust (JNHT).

The Jamaica National Heritage Trust Act of 1985 established the JNHT. The Trust's functions outlined in Section 4 include the following responsibilities:

- To promote the preservation of National Monuments and anything designated as Protected National Heritage for the benefit of the Island;
- To carry out such development as it considers necessary for the preservation of any National Monument 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:
    - Wilfully deface, damage or destroy any national monument 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 monument 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 of Jamaica.

S.5 Historically, the area contains historic and archaeological sites dating back to Jamaica's first known inhabitants (The Taíno) and later those who came the Spanish, the Africans and the British. The area has seen various land uses over the past centuries. Sugar estates were established on the fertile plains of the Linstead Bog Walk Basin in the late 17th century and the Caymanas in the 18th century. Cattle rearing also occurred in the area and whilst some plantations were solely devoted to this activity from the outset of the plantation period other estates were converted to grazing pens with the downturn in sugar production. Coffee, bananas and citrus were grown on large and small farms throughout the area. It should be noted that all the plantations, pens and estates in the area had plantation houses and enslaved villages.

S.6 In all 19 sites have been noted for the area with ten of these sites showing a Taíno presence. A total of 235 pieces of artefacts were collected from the surface of seven sites namely Caymanas, Cross Pen, Content, Crescent, Dignum Mountain, Harker and Wakefield. The team recorded a number of historic structures and features such as the Rio Cobre Dam and pipeline, the railway lines at Crescent and Vanity Fair, the great house ruin at Cross Pen.

S.7 **Table 1:** Impact on Significant Heritage sites

Site	Site ID	Grid Reference	Impact	Mitigation
CAYMANAS ESTATE			Affect irrigation system	Preservation of the historic water canal. A bridge should be built over the canal.
Taíno Site 1	1B	760541.0400E 653211.9500N	Highway will pass through prehistoric and historic site	Monitoring to be conducted during clearing and excavation stages. Further evaluation to ascertain magnitude of site.
CROSS PEN				
Taíno Site 2	2C	754790.9600E 653509.4800N	Destruction of Taíno sites	Monitoring to be conducted during clearing and excavation stages. Further evaluation to ascertain magnitude of sites.
Taíno Site 3	2D	753855.6400E 653790.8100N		
Obama Heights Housing Development	2E	754260.5200E 653723.8000 N	Goes straight the community- destruction of houses	Carry out further archeological evaluation Acquire land and relocate affected residents.
House with cut stone foundation	2F	753288. 8100 E 654302.3700N		
Abandoned factory Quarry	2G	754521.1500E 653799.5400N		Shift centre alignment to the north thus avoiding community and agricultural fields.
NWC Pumping Stations	2H	755231.2900E 653286.0400N	Destruction of quarry	
Great House Ruin and compound	2I	753831.8800E 653790.9600N	Disruption of water supply	Carry out evaluation before construction and carry out rescue operation during construction Carry out further archeological evaluation
	2J	753831.8800E 653705.9600N	Destruction of fields	

CONTENT				
Taíno Site 4	2K	752592.5100E 654826.8400N	Destruction of Taíno sites Goes straight the community- destruction of houses Destruction of fields	Carry out further archeological evaluation before construction and carry out rescue operation during construction Acquire land and relocate affected residents.
Cemetery	2L	752621.8900E 654825.9200N	Destruction of cemeteries	Shift centre alignment to the north thus avoiding community and agricultural fields.
Pumping Stations (W)	2M	752396.6300E 654851.4800N	Disruption of water supply	Relocation of cemeteries
Pipeline	2N	752669.3400E 654784.4400N	Disruption of water supply	
Path	2O	752226.4100E 654002.0600N	Disruption of access route to fording	
CRESCENT				
Taíno Site 5	3A	752004.8800E 655371.6200N	Highway will pass through Prehistoric site	Monitoring to be conducted during clearing and excavation stages. Further evaluation to ascertain magnitude of site
Taíno Site 6	3B	751703.1000E 655604.03N		
			Goes straight the community- destruction of houses	Acquire land and relocate affected residents. Shift centre alignment to the north thus avoiding community
DIGNUM MOUNTAIN				
Taíno Site 7	3C	750152.0900E 657875.9200N	Highway will pass through prehistoric site	Monitoring to be conducted during clearing and excavation stages. Further evaluation

				to ascertain magnitude of site
Dwellings			Goes straight a section of the community- destruction of houses	Acquire land and relocate affected residents. Shift centre alignment to the north thus avoiding community
Railway line			Traverses railway line	Build bridge over line
HARKER				
Dwellings	3D	748685.94000 E 659959.6000 N	Dwellings will be destroyed	Acquire land and relocate affected residents
Taíno Site 8	3E	748808.1600 E 660188.1300 N	Will destroy a significant portion of the Harker Taíno site	Carry out further archeological evaluation
PUSS GULLY/GIBRALTAR				
Foundation, assemblage of artefacts including Taíno	3F	748968.6800E 659215.9600N	Will destroy foundation and wall also assemblage of artefacts- Taíno site	Carry out further archeological evaluation Monitoring to be conducted during clearing and excavation stages.
WAKEFIELD				Carry out further archeological
Taíno Site 9	4A	747395.2600E 661202.4100N	Will destroy a significant amount of sites	evaluation Monitoring to be conducted during
Assemblage of artefacts including Taíno sherds	4B	747165.8300E 661219.2000N		clearing and excavation stages.
CAMBRIAN				
Farm buildings	4C	745675.9400E 662471.1800N	Impact on farm buidings	Acquire property or shift alignment
BANBURY				
Dwellings, Shops	4D	745691.1300E 665225.1500N	Impact on several dwelings, shops	Relocate affected persons
Dwellings	4E	745898.6900E		

		665551.6800N		
VANITY FAIR				
Dwellings, commercial buildings, fire station, railway line, road	4F	746318.8700E 666255.3600N	Impact on several houses, commercial buildings, fire station, railway line, road	Relocate affected persons, rebuild fire station
Nursing Home, houses, commercial buildings, orchard	4G	7446339.1200E 666128.7900N		
BYNDLOSS				
Commercial buildings	4H	746776.8500E 666587.3900N	Will destroy buildings	Relocate affected persons

S.8 The survey techniques employed in this project were dictated by the nature of the topography, vegetation cover, accessibility and time allowed for the survey. It is believed that these techniques will provide us with the best possible coverage and accuracy of the results. The techniques bring us in direct contact with the sites and the people who will be affected by the highway. The background information on the various communities was derived from primary documentary sources, oral traditions and supported by secondary narratives.

S.9 For easy reference, the proposed development area was divided into four zones based on topography and vegetation cover: - Zones 1, 2, 3 and 4. A map and site inventory with the threats to these sites (where possible) was generated with highlights for further study and recommendations made. It should be noted that time did not allow for a comprehensive assessment of all sites in the study area but what was covered is representative of the cultural heritage in the area. A table of contents guides the reader. The study is complete with photographs of these historical remains, current usage of these sites and artefacts as well as modern structures that now occupy these historic sites.

1. INTRODUCTION

1.1 Purpose

The Highway 2000 Project is one of the Government of Jamaica's ambitious but necessary highway projects designed to drastically reduce travelling time to various parts of the island and to open rural Jamaica and stimulate economic growth and development *inter alia*. It began in 2001 with the construction of the Old Harbour Bypass, followed by the Bushy Park to Portmore segment and then the Portmore Causeway. Currently, the alignment from Sandy Bay to Williamsfield is under construction, while the Mount Rosser Bypass is near completion. This proposed leg, the **North-South Highway link,** is designed to connect the Bushy Park to Portmore alignment to the Mount Rosser Bypass (Linstead to Moneague). It will include construction on existing road alignment at Byndloss and cutting and constructing of new roadway from Caymanas to Byndloss.

The purpose of this document is to present the findings of an Archaeological Impact Assessment for the proposed North-South Highway Link which starts at Caymanas and ends at Byndloss. It traverses large tracts of alluvial plains and karst limestone hills and platform. The alignment takes it through areas of natural habitats and settlements, thus having ramifications on both the natural and cultural environment. The study seeks to collate the best available information relating to the study area, both in terms of formal data sets and local knowledge to ensure informed decision making and guaranteeing a sustainable project.

This Archaeology Impact Assessment was done in accordance with the Jamaica National Heritage Trust stipulated standards and guidelines for AIAs. The study was commissioned by CL. Environmental Limited and is partial fulfilment of an Environmental Assessment required by the National Environmental Planning Agency (NEPA) before consideration and environmental permit issued for development of this magnitude.

1.2 Objectives

The research objectives of the assessment are to ascertain the presence of historical and archaeological resources and describe the status of these resources, along with any other socio-economic attributes and appraise their worth in context of the proposed development, legislative

and regulatory considerations. In addition, to identify and predict any potential positive, negative, reversible, irreversible, short and long term impact and to indicate possible mitigation to negative impacts, as well as recommendations to enhance positive impacts, also to outline possible alternatives to the project and or aspects of it. Where necessary indicate suitable management and monitoring plan for the earth breaking stage of the project.

1.3 Scope of Work

Scope of work for this assessment includes the following:

Task 1: Desk-Based Assessment – (a) Research relevant historical documentations: maps, plans, estate accounts, correspondents, titles, and deeds; (b) Research published and unpublished narratives, studies and data sets of the study area, adjoining areas and associated projects; (c) Analysis of satellite images and aerial photographs.

Task 2: Site Survey – Conduct archaeological field walk and windshield survey, artefacts sample collection and analysis, cultural heritage contexts interpretation and analysis and recording significant cultural assets to be affected.

Task 3: Description of the Proposed Project – Provide a full description of the project and its existing setting, using plans, maps and photograph. This is to include: location, general proposed alignment and the 100 metres buffer zone along with those areas of cultural significance that will be negatively impacted indirectly.

Task 4: Description of the Project Area – Assemble, evaluates and presents baseline data on the relevant environmental characteristics of the study area, including (a) Physical environment: geology, topography, soils and drainage system; (b) Biological environment: flora and fauna that have cultural implications; (c) Socio-cultural environment: communities, infrastructures, land-use and community perception and attitudes towards the proposed project.

Task 5: Determination of Potential Impacts – presents major issues of archaeological and socio-economic concerns and indicate their relative importance. Outline construction and post-construction phase impacts, significant positive and negative impacts, and direct and indirect impacts.

Task 6: Negative Impact and Mitigation Management – Recommend feasible and cost effective measures to prevent or reduce the significant negative impacts to acceptable levels.

Task 7: Development of a Monitoring Plan – Present a plan for monitoring the implementation of mitigating measures and the impacts of the project during construction.

1.4 Structure of the Report

The Archaeological Impact Assessment Report is a concise collation of significant cultural environmental issues. Its main text focus on impact, mitigation and monitoring management plans. The report is organized into ten (10) sections as outlined below:

- Introduction
- Description of Proposed Project
- Description of Project Area
- Methodology
- Desk-Based Assessment Results
- Site Assessment Results
- Impact Identification /Mitigation Recommendation
- Study Evaluation
- Appendices
- Bibliography

1.5 Policy and Legislative Framework

There are a number of pertinent policies, legislation, regulations and environmental standards of the Government of Jamaica (GOJ) relating to environmental protection that are applicable to any development and that a developer will need to consider when embarking on a particular scale and type of development. There are several government agencies mandated with the authority to control certain types of development that may have potential negative impact on the natural and

cultural environment. The powers of control and regulation are typically exercised through a system of permits that include checks and balances on what kind and form of development can occur. A developer therefore must be prepared to present, explain, and in some cases alter aspects of a development proposal in order to comply with the permitting requirements. This section therefore highlights the relevant authorities, legislation and regulations that must be considered in order to acquire the necessary permit applicable to the development.

1.5.1 Natural Environment

1.5.1.1 Natural Resources Conservation Authority Act (1991)

The Natural Resources Conservation Authority Act was passed in the Jamaican Parliament in 1991 and provided the basis for the establishment of the Natural Resources Conservation Authority (NRCA) with primary responsibility for ensuring sustainable development in Jamaica through the protection and management of Jamaica's natural resources and control of pollution. Sections 9 and 10 of the NRCA Act stipulate that an Environmental Impact Assessment (EIA) is required for new projects and existing projects undergoing expansion. The body is also responsible for investigating the effect on the environment of any activity that may cause pollution or which involves waste management. Sections of the Act that relate specifically to pollution control state that:

(i) No person shall discharge on or cause or permit the entry into waters, on the ground or into the ground, of any sewage or trade effluent or any poisonous noxious or polluting matter.

(ii) No person is allowed to construct or reconstruct or alter any works designed for the discharge of any effluent.

The Act also empowers the authority to require of any owner or operator of a pollution control facility to provide information on the performance of the facility, the quantity and condition of effluent discharged and the area affected by the discharge of such effluent. The Authority has the right to consult with any agency or department of Government having functions in relation to water or water resources to carry out operations to:

(a) Prevent pollutants from reaching water bodies.

(b) Remove and dispose of any polluting matter or remedy or mitigate any polluted water body in order to restore it.

1.5.1.2 Environmental Review and Permitting Process (1997)

The Environmental Permit and License System (P&L), introduced in 1997, is a mechanism to ensure that all developments in Jamaica meet required standards in order to minimize negative environmental impacts. The P&L System is administered by NEPA, through the Applications Secretariat of the Application Branch. Permits are required by persons undertaking new development which fall within a prescribed category. Under the NRCA Act of 1991, the NRCA is authorized to issue, suspend and revoke permits and licences if facilities are not in compliance with the environmental standards and conditions of approval stipulated. An applicant for a Permit or License must complete an application form as well as a Project Information Form (PIF) for submission to the NRCA.

1.5.1.3 Wildlife Protection Act (1945)

The Wildlife Protection Act of 1945 prohibits removal, sale or possession of protected animals, use of dynamite, poisons or other noxious material to kill or injure fish, prohibits discharge of trade effluent or industrial waste into harbours, lagoons, estuaries and streams, and authorizes the establishment of Game Sanctuaries and Reserves. Protected under the Wildlife Protection Act are six species of sea turtle, one land mammal, one butterfly, three reptiles and several species of birds including rare and endangered species and game birds.

1.5.1.4 The Endangered Species (Protection, Conservation and Regulation of Trade) Act (2000)

This Act deals with restriction on trade in endangered species, regulation of trade in species specified in the schedule, suspension and revocation of permits or certificates, offences and penalties, and enforcement. Many species of reptile, amphibian and birds that are endemic to Jamaica but not previously listed under national protective legislation, or under international legislation, are listed in the Appendices of this Act.

1.5.1.5 **The Natural Resources (Prescribed Areas) (Prohibition of Categories of Enterprise, Construction and Development) Order (1996)**

The island of Jamaica and the Territorial Sea of Jamaica have been declared a Prescribed Area. No person can undertake any enterprise, construction or development of a prescribed description or category except under and in accordance with a permit. The Natural Resources Conservation (Permits and Licenses) Regulations (1996) give effect to the provisions of the Prescribed Areas Order.

1.5.1.6 **Water Resources Act (1995)**

The Water Resources Act of 1995 established the Water Resources Authority (WRA). This Authority is authorized to regulate, allocate, conserve and manage the water resources of the island. The Authority is also responsible for water quality control and is required under Section 4 of the Act to provide upon request to any department or agency of Government, technical assistance for any projects, programmes or activities relating to development, conservation and the use of water resources. It is the responsibility of the WRA as outlined in Section 16 to prepare, for the approval of the Minister, a draft National Water Resources Master Plan for Jamaica. Areas to be covered in this Draft Master Plan of 1990 included objectives for the development, conservation and use of water resources in Jamaica with consideration being given to the protection and encouragement of economic activity, and the protection of the environment and the enhancement of environmental values. Section 25 advises that the proposed user will still have to obtain planning permission, if this is a requirement, under the Town and Country Planning Act. In addition, Section 21 of the Act stipulates that if the water to be used will result in the discharge of effluents, an application for a license to discharge effluents will have to be made to the Natural Resources Conservation Authority or any other relevant body as indicated by the Minister. With regard to underground water, Section 37 states that it is unlawful to allow this water to go to waste. However, if the underground water "interferes or threatens to interfere with the execution or operation of any underground works", it will not be unlawful to allow the water to go to waste in order to carry out the required works provided that there is no other reasonable

method of disposing of the water. The Authority also has the power to determine the safe yield of aquifers (Section 38).

1.5.1.7 **Country Fires Act (1942)**

Section 4 of the Country Fires Act of 1942 prohibits the setting of fire to trash without prior notice being given to the nearest police station and the occupiers of all adjoining lands. In addition, a space of at least 4.5 metres (15 feet) in width must be cleared around all trash to be burnt and all inflammable material removed from the area. Section 6 of the Act empowers the Minister to prohibit, as may be necessary, the setting of fire to trash without a permit. Offences against this Act includes:

- Setting fire to trash between the hours of 6.00 p.m. and 6.00 a.m. (Section 5a);
- Leaving open-air fires unattended before they have been completely extinguished (Section 5b);
- Setting fires without a permit and contrary to the provisions outlined in Section 6 (Section 8);
- Negligent use or management of a fire which could result in damage to property (Section 13a);
- Smoking a pipe, cigar or cigarette on the grounds of a plantation which could result in damage to property (Section 13b).

1.5.1.8 **Quarries Control Act (1983)**

The Quarries Control Act of 1983 established the Quarries Advisory Committee, which advises the Minister on general policy relating to quarries as well as on applications for licenses. The Act provides for the establishment of quarry zones, and controls licensing and operations of all quarries. The Minister may on the recommendation of the Quarries Advisory Committee declare as a specified area any area, in which quarry zones are to be established and establish quarry zones within any such specified area.

Section 5 of the Act states that a license is required for establishing or operating a quarry though this requirement may be waived by the Minister if the mineral to be extracted is less than 100 cubic metres. Application procedures are outlined in Section 8. The prescribed form is to be filed with the Minister along with the prescribed fee and relevant particulars. The applicant is also

required to place a notice in a prominent place at the proposed site for a period of at least 21 days starting from the date on which it was filed.

1.5.1.9 **The Pesticides (Amendment) Act (1996)**

The Pesticides (Amendment) Act of 1996 amended sections of the principal act, which came into effect in 1975 and established the Pesticides Control Authority. This Act gives the Authority the responsibility of controlling the importation, manufacture, packaging, sale, use and disposal of pesticides. Section 11 states that the Authority is required to keep a register or record of all relevant information such as registered pesticides, restricted pesticides, pest control operators and persons licensed to import or manufacture pesticides. Under Section 16 of the Act, the Authority may also, with the approval of the Minister, make regulations which relate to areas such as:

- Aerial application of pesticides;
- Supervision required for the use of pesticides, the prescribed protective clothing to be worn and other precautionary measures;
- The permissible levels of pesticides to be used;
- The periods during which particular pesticides may or may not be used on certain agricultural crops;
- The disposal of pesticides and packages.

1.5.1.10 **Clean Air Act (1964)**

This act refers to premises on which there are industrial works, the operation of which is in the opinion of an inspector likely to result in the discharge of smoke or fumes or gases or dust in the air. An inspector may enter any affected premise to examine, make enquiries, make tests and take samples of any substance, smoke, fumes, gas or dust as he considers necessary or proper for the performance of his duties.

1.5.1.11 The Natural Resources Conservation Authority (Air Quality) Regulations, 2002

Part I of this Act stipulates license requirements and states that every owner of a major facility or a significant facility shall apply for an air pollutant discharge license. Part II speaks to the stack emission targets, standards and guidelines.

The Act states that no person shall emit or cause to be emitted from any air pollutant source at a new facility, any visible air pollutants the opacity or pollutant amount of which exceeds the standards. Every owner of a facility with one or more air pollutant source or activity shall employ such control measures and operating procedures as are necessary to minimise fugitive emissions into the atmosphere, and such owner shall use available practical methods which are technologically feasible and economically reasonable and which reduce, prevent or control fugitive emissions so as to facilitate the achievement of the maximum practical degree of air purity. Under this Act a "major facility" is described as any facility having an air pollutant source with the potential to emit:

(a) One hundred or more tonnes of any one of total suspended particulate matter (TSP);
(b) Particulate matter with a diameter less than ten micrometres (PM10);
(c) Sulphur oxides measured as sulphur dioxide (SO_2);
(d) Carbon monoxide (CO);
(e) Nitrogen oxides (NOx) measured as equivalent nitrogen dioxide;
(f) Five or more tonnes/y lead;
(g) Ten or more tonnes per year of any single priority air pollutant; or
(h) Twenty-five or more tonnes per year of any combination of priority air pollutants;

1.5.1.12 Noise Standards

Jamaica has no national legislation for noise, but World Bank guidelines have been adopted by the National Environment and Planning Agency (NEPA), and are used for benchmarking purposes along with the draft National Noise Standard that is being prepared. The guidelines for daytime perimeter noise are 75 decibels and 70 decibels for night time noise.

1.5.2 Social Environment

1.5.2.1 Town and Country Planning Act (1958)

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. This order may:

- Prohibit the cutting down, topping, lopping or wilful destruction of trees;
- Secure the replanting of any section of the woodland area in which trees were felled during the forestry operations permitted under the order.

The tree preservation order is not applicable to the cutting down of trees which were already dead, dying or had become dangerous and the order can take effect only after it has been confirmed by the Minister. The Minister can, under Section 26 of the Act, make regulations to restrict and regulate the display of advertisements in any area to be developed if he considers this to be in the interest of public safety. Section 28 of the Act empowers the local authority to require the owner or occupier of land in the development area to take the steps necessary to ensure its proper maintenance.

1.5.2.2 **Land Development and Utilization Act (1966)**

Under Section 3 of the Land Development and Utilization Act (1966), the Land Development and Utilization Commission is authorized to designate as agricultural land, any land which because of its "situation, character and other relevant circumstances" should be brought into use for agriculture. However, this order is not applicable to land, which has been approved under the Town and Country Planning Act for development purposes other than that of agriculture. Among the duties of the Commission outlined in Section 14 of the Act is its responsibility to ensure that agricultural land is "as far as possible, properly developed and utilized".

1.5.2.3 **Public Health Act (1976)**

The Public Health (Air, Soil and Water Pollution) Regulations 1976, aim at controlling, reducing, removing or preventing air, soil and water pollution in all possible forms. Under the regulations given:

i. No individual or corporation is allowed to emit, deposit, issue or discharge into the environment from any source.
ii. Whoever is responsible for the accidental presence in the environment of a contaminant must advise the Environmental Control Division of the Ministry of Health and Environmental Control, without delay.
iii. Any person or organization that conducts activities which release air contaminants such as dust and other particulates is required to institute measures to reduce or eliminate the presence of such contaminants.
iv. No industrial waste should be discharged into any water body which will result in the deterioration of the quality of the water.

1.5.2.4 **The National Solid Waste Management Authority Act (2001)**

The National Solid Waste Management Authority Act (2001) is "an act to provide for the regulation and management of solid waste; to establish a body to be called the National Solid Waste Management Authority and for matters connected therewith or incidental thereto". The Solid Waste Management Authority (SWMA) is to take all steps as necessary for the effective management of solid waste in Jamaica in order to safeguard public health, ensure that waste is collected, sorted, transported, recycled, reused or disposed of, in an environmentally sound manner and to promote safety standards in relation to such waste. The SWMA also has responsibility for the promotion of public awareness of the importance of efficient solid waste management, to advise the Minister on matters of general policy and to perform other functions pertaining to solid waste management.

1.5.2.5 **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 outlined in Section 4 include the following responsibilities:

- To promote the preservation of National Monuments and anything designated as Protected National Heritage for the benefit of the Island;
- To carry out such development as it considers necessary for the preservation of any National Monument 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:
    - wilfully deface, damage or destroy any national monument 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 Monument 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 of Jamaica.

1.5.2.6 **Land Acquisition Act (1947)**

Section 3 of the Land Acquisition Act (1947) empowers any officer authorized by the Minister to enter and survey land in any locality that may be needed for any public purpose. This may also involve:

- Digging or boring into the sub-soil;
- Cutting down and clearing away any standing crop, fence, bush or woodland;
- Carrying out other acts necessary to ascertain that the land is suitable for the required purpose

The Minister is authorized under Section 5 of the Act to make a public declaration under his signature if land is required for a public purpose provided that the compensation to be awarded for the land is to be paid out of the:

- Consolidated Fund or loan funds of the Government;
- Funds of any Parish Council, the Kingston and St. Andrew Corporation or the National Water Commission

Once the Commissioner enters into possession of any land under the provisions of this Act, the land is vested in the Commissioner of Lands and is held in trust for the Government of Jamaica in keeping with the details outlined in Section 16. The Commissioner shall provide the Registrar of Titles with a copy of every notice published as well as a plan of the land. The Commissioner will also make an application to the Registrar of Titles in order to bring the title of the land under the operation of the Registration of Titles Act.

1.5.2.7 **Registration of Titles Act (1989)**

The Registration of Titles Act of 1989 is the legal basis for land registration in Jamaica, which is carried out using a modified Torrens System (Centre for Property Studies, 1998). Under this system, land registration is not compulsory, although once a property is entered in the registry system the title is continued through any transfer of ownership.

1.5.3 International Legislative and Regulatory Considerations

1.5.3.1 Convention on Biological Diversity

The objectives of the Convention on Biological Diversity are "the conservation of biological diversity, sustainable use of its components and the fair equitable sharing of the benefits arising out of the utilization of genetic resources". This is the first global, comprehensive agreement which has as its focus all aspects of biological diversity: genetic resources, species and ecosystems. The Convention acknowledges that the "conservation of biological diversity is a common concern of humankind and an integral part of the development process". In order to achieve its goals, the signatories are required to:

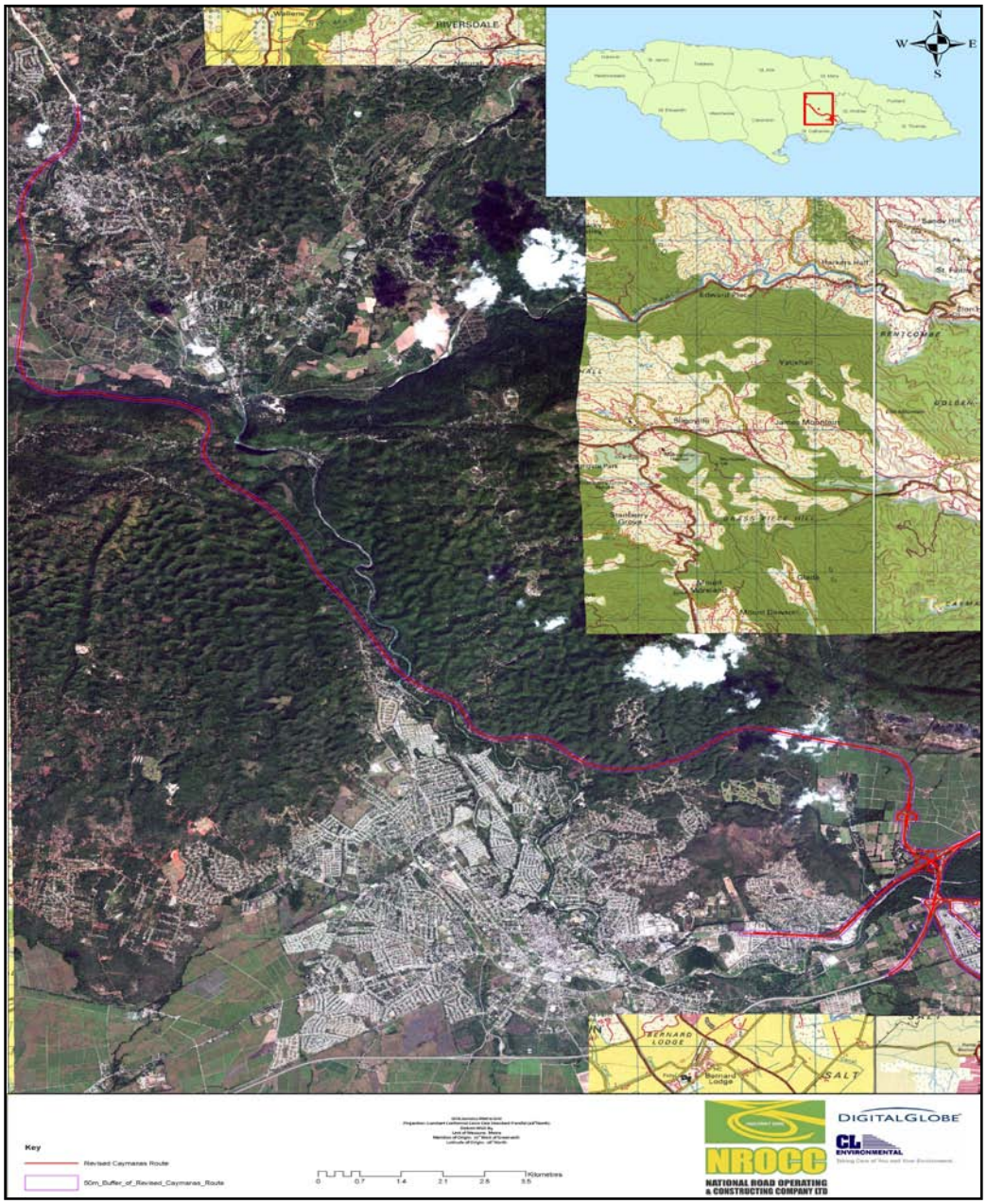
- Develop plans for protecting habitat and species.
- Provide funds and technology to help developing countries provide protection.
- Ensure commercial access to biological resources for development.
- Share revenues fairly among source countries and developers.
- Establish safe regulations and liability for risks associated with biotechnology development

Jamaica's Green Paper Number 3/01, entitled *Towards a National Strategy and Action Plan on Biological Diversity in Jamaica,* and speaks to Jamaica's continuing commitment to its obligations as a signatory to the Convention.

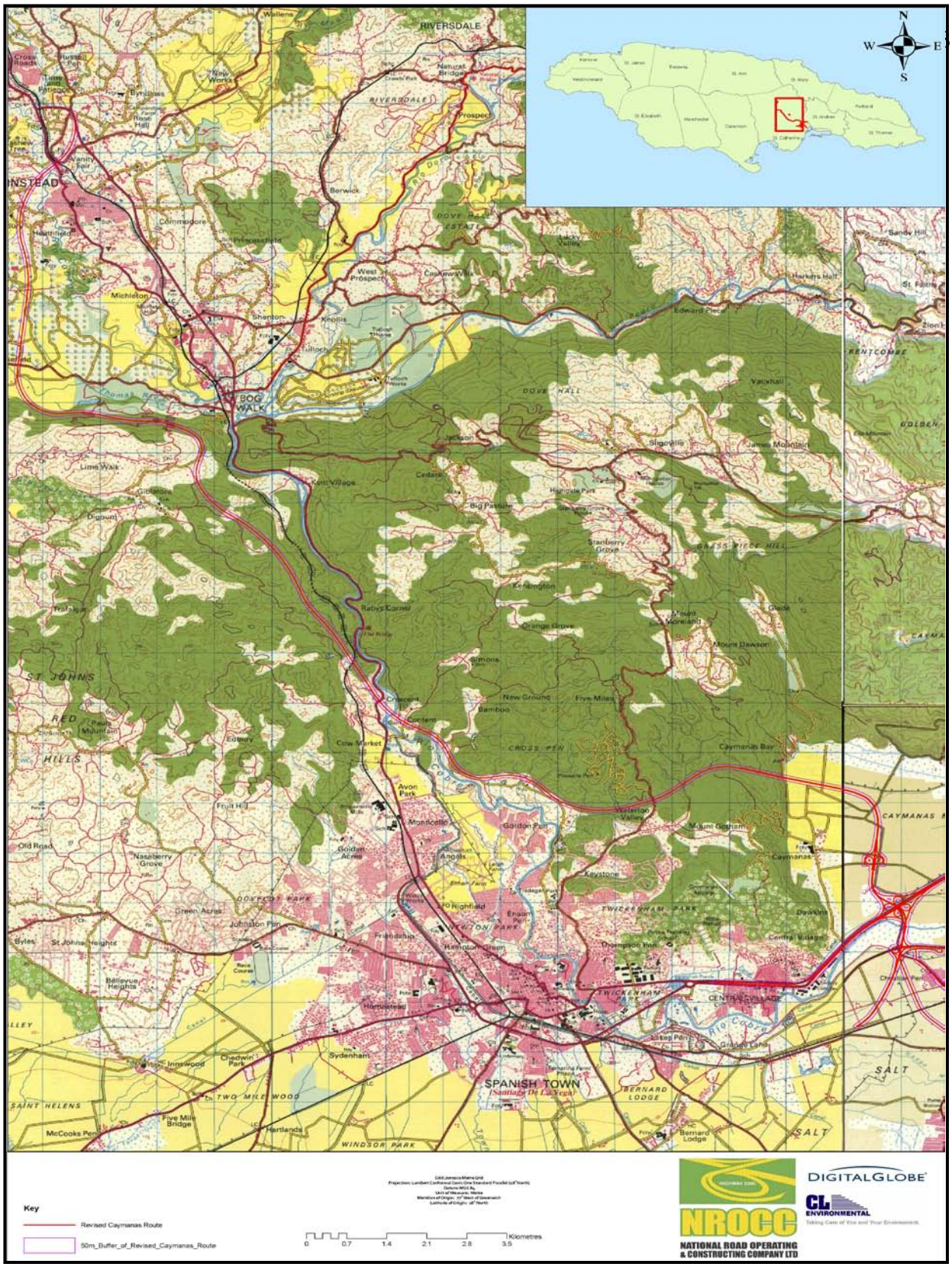
2. PROPOSED PROJECT

The Caymanas to Byndloss Proposed Highway Development is part of the Highway 2000 North-South Link Project. The North-South Highway Link is divided into four sections, (1) Spanish Town to Bog Walk, (2) Linstead Bypass, (3) Mount Rosser Bypass, and (4) Moneague to Ocho Rios. Sections 1 & 2 for which the permit is being sought is a four lane controlled access, tolled motorway with separated interchanges and intersections built according to modern international standards. The alignment runs in a general northerly direction through the Caymanas cane lands, Waterloo Valley, Cross Pen, and Content crossing the Rio Cobre Dam, through Crescent, the Gibraltar Mountains into Wakefield, Cambrian, Heathfield, and Vanity Fair ending at Byndloss. A partial interchange will be created where the alignment crosses the Dawkins Caymanas providing on and off access.

The following maps were provided by the developers which seek to outline the proposed alignment.



Map 2: Showing proposed route of highway



Map 3: Showing proposed route of highway

3. PROJECT AREA

For easy reference the proposed development area was divided into four zones based on topography and vegetation cover- Zones 1, 2, 3 and 4:

- Zone 1 runs through the Caymanas (East St. Catherine Plains)
- Zone 2 runs from Mount Gotham the Rio Cobre Dam
- Zone 3 runs from Crescent to Lime Walk (Karst limestone hills and plateau)
- Zone 4 runs from Wakefield to Byndloss (Linstead, Bog Walk Basin)

Topography

Zone 1– occupies a portion of the East St. Catherine Plains that includes the Caymanas Estates. The area is composed of alluvial sedimentary rocks and the topsoil is predominantly fertile clay loam. It is drained by numerous streams and springs such as the Ferry River, Lagoon River and Governors Spring.

Zone 2- contains the uplands of Mount Gotham and the interior valleys where the Rio Cobre River forms the southern border.

Zone 3- The topography of the area maybe described as karst and consists of Limestone Hills and Plateaus. These hills are part of a unique arid limestone forest, made up of middle Eocene Troy and Claremont limestones. These limestones are said to be faulted, and these form a barrier between the two main drainage areas in St. Catherine the North Linstead Basin and the South St. Catherine Plains. They are pervaded by numerous caves, caverns, sinkholes, dry gullies and disappearing streams.

Zone 4- Linstead Bog Walk Basin is said to be a large fertile alluvial polje, drained by the Rio Cobre and its tributaries such as the Thomas and Black Rivers.

Vegetation

Vegetation along the length of the proposed highway is diverse ranging from dense woodlands forests to plantation/cultivations and pastures. The East St. Catherine Plains is dominated by sugar cane cultivation and has been over many years the main producer of this crop.

Zone 2 is predominantly a residential and farming area and as such it is dominated by many small farms producing cash crops and contains other domesticated plants. The zone has several karst limestone hills covered with natural vegetation.

The karst limestone hills of Zone 3 are covered by dense tropical rainforest type vegetation with sporadic areas of peasant farming and other domesticated plants.

Zone 4 is predominantly a residential and farming area and as such it is dominated by plantations, cash crops and peasant farming and other domesticated plants.

Jamaica Is known as the land of wood and water and in the early days of European settlement these created barriers to the development of the country until lands were cleared for agricultural pursuits. However transformation of the landscape would have taken place beginning with the Taíno clearing for the planting of fields and the opening of trails. The Spanish settled near to the Taíno and seemed to have continued using the Taíno trails. In some places the English constructed new roads but they also used the Taíno-Spanish trails. The construction of roads disturbed natural vegetation but opened areas for agricultural pursuits.

The road that traverses the karst limestone zone along which the proposed alignment will travel in parts may be one of Taíno trails, which may have been used by the Spanish subsequently the British and became the main route to the north coast up to 1770 when the road through the Bog Walk Gorge was constructed.

AGRO- INDUSTRIES

The early 17th century settlers produced and exported crops that required a small labour force. Chief crops were tobacco indigo, cocoa, cotton and pimento.

Sugar Estates

The Spanish introduced the sugar cane (*saccharum offcinarum*) into the island. They grew sugar on a small scale and erected small mills. It was not until the 1660's that an attempt was made to put the sugar industry on a regular footing by Sir Thomas Modyford, the English governor (Senior 1983:157-8).

The large-scale production of sugar was undertaken in the Linstead Basin. Sugar dominated the region from the end of the 17th century to the end of the 19th century with each estate having its own mill. Throughout this period some estates also changed hands.

A down turn in the fortunes of sugar resulted in a change to other produce – first bananas, then cattle and finally citrus. This change is noted for the estates such as Rose Hall, Byndloss, Mickleton and Bybrook.

Pens and the Dairy Industry

During the 18th and 19th centuries cattle was raised and food provisions grown on estates called pens. Pens were established on lands unsuitable for the growth of sugar cane. Some estates that suffered from the fallout in sugar also took up pen keeping.

Pens produced livestock, grass, and ground provisions for the local market. These pens supplemented their income by growing pimento, cotton and logwood for export. Worn out cattle from estates were purchased and fattened for the local market. Timber for building small craft and wharf-pilings were produced. The word 'Pen' in the place names in the study area recalls the former industry of pen keeping.

Coffee

Coffee was grown in the hilly areas by small settlers. In more recent times a branch of the Wallenford Coffee works has been established at Jew Pen (Bog Walk).

Citrus

With the demise of the sugar and banana estates in the Linstead- Rio Cobre Basin a section of the land was put into citrus cultivation.

Peasant farming

In the post emancipation period many settlements emerged in the area as large acres of lands were cleared for peasant farming in the hilly regions. Staples such as cassava, yam, and other foodstuff were grown replacing natural vegetation. Some areas have now been abandoned (demographic shift of population) but the domesticated plants still thrives in these places.

4. METHODOLOGY

It is being predicted that in the areas traversed by the proposed highway a number of historic and prehistoric sites will be affected. In the context of resource and environmental limitations the methods employed to survey the area should give us the best possible results in identifying and assessing the nature and extent of impact.

For this phase of the project a multi faceted approach was used including oral history and documentary research, the zoning of the project area, archaeological field surveys and data processing.

Desk-Based Assessment

This is a thorough review of all the available written and graphic information relating to the area in order to identify the likely character, extent and relative quality of the actual or potential archaeological and architectural resources. It includes relevant historical documents, journals and books, aerial photographs and/or satellite imagery, maps and other contemporary data found in the nation's repositories such as the Island Record Office, National Archives, National Library of Jamaica, University of Technology (UTECH), University of the West Indies (UWI) and private collections. Web sites were also consulted.

- Historical documentation including, maps, plans, estate accounts, correspondence, titles, deeds, just to list a few.
- Published and unpublished results of any previous archaeological work on the site or in its vicinity.
- Satellite images and aerial photographs.

Oral History

Oral history research was conducted in order to bridge the data gap and to identify and describe additional resource material, to more exactly identify the location of sites and to generate a more comprehensive cultural heritage bibliography (Appendix 4). This information was used to create a

comprehensive list of sites and other cultural heritage elements in the data gap areas that needed to be visited.

Windshield and Field Walk

Windshield

Survey of area done from the confinement of a motor vehicle

Field Walk Survey

A Transect Linear Field Walk survey was the archaeological technique employed to identify areas of pre-historic and/or historic activities and features.

The site is divided into Survey Zones and combed in an east to west direction. Members of the archaeological team dispersed into intervals and surveyed each zone walking in parallel lines where possible. In areas of disturbed soil, such as uprooted trees and cuttings, the soil profile was examined to ascertain the existence or non-existence of cultural stratigraphy below the surface.

Recording and Analysis of Artefacts

All archaeological features, including artefacts, were recorded by means of sketches, digital photographs, GPS, survey, and field notes.

Where artefact assemblages were identified, samples were collected and recorded for analysis. Preliminary analysis of artefacts was done to establish manufacture location and cultural association.

Individuals familiar with the site were interviewed and this information noted to add to the data base on sites.

5. DESK-BASED ASSESSMENT RESULTS

The proposed highway will traverse the current parish of St. Catherine; however, in the historic context it will run through the parishes of St. Thomas in the Vale (Y Vale), St. John and St. Katherine. When the parishes were reduced from 22 to 14 in 1867 St. Thomas in the Vale and St. John were absorbed into St. Catherine.

It should be noted that some of the place names of the areas that the proposed highway will traverse do not appear on the current 1: 50, 000.00 maps so data had to be used from the cadastral survey map especially that of Thomas Harrison's St. Catherine 1882.

Historical Background

Caymanas Estate

Historic Background

The Caymanas Estate is an amalgamation of three historic properties: Ellis, Taylor and Dawkins all located on the marshy coastal plain 6 km (4 miles) east of Spanish Town, and north of the main road to Kingston. At Emancipation Ellis Caymanas was the smallest with 120 slaves and made 120 hogsheads of sugar and 80 puncheons of rum. Dawkins Caymanas had 200 slaves and Taylors Caymanas had 285 slaves. By 1837 Taylors Caymanas had become the property of James Ewing, a Glasgow merchant. Sometime before 1880 Ewing's Caymanas engrossed Ellis and by 1885 it had also taken over Dawkins. In 1885 Caymanas was the leading producer in Jamaica, making 760 hogsheads of sugar and 300 puncheons of rum, occupying 6,000 acres. Caymanas then employed a steam mill, vacuum pan and centrifugal (Higman 1988:151).

Map 4: Extract from Craskell and Simpson's map of 1763 showing some of the estates in the area including The Crescent, Ellis, Taylor and Dawkins

Mount Gotham

Historic Background

In 1810 three owners are recorded for Mount Gotham: James Lee with 29 enslaved persons and 8 heads of stock, Miss Lake with 60 enslaved persons and 20 heads of stock and John Lundie (deceased) with 61 enslaved persons and 16 heads of stock.

In 1832 – 19 persons owned land at Mount Gotham

Table 2: Showing persons owning land in 1832 in Mount Gotham

Property	Owner	Slaves	Stock
Mount Gotham	Frances V. Brooks	68	18
	Frances Brown	5	-
	Indiana Brown	3	-
	Jane Brown estate of	18	-
	John Brown	6	-
	William Bryan	8	1
	Francis Bryant	1	-
	William Bullock	65	5
	Louisa Ann Burnett	6	
	George P. Burrell	70	
	Mary Burrell	4	
	John B. Burrowes	12	
	Thomas H. Burton	3	
	Ann Bygrave	6	
	Alice Campbell	6	
	William Campbell	6	
	Robert Cargill	9	5
	Susanna Charlton	5	
	Eloise Clare	3	

Eight persons are recorded for 1840 (1) George Groves with 320 acres, John B Garel with 190', Rebecca Lyon with 200 acres, Jane Letts with 248', John Llado with 400', Catherine Lorrain with 76', J. V. Leach with 17 acres/358' and John H. Laing with 100'.

In 1845 R. Lyon owned 200 acres and R.P. Parry 310 acres.

William Powell owned 81 acres valued at £41 in 1912. There was mixed cultivation but the property consisted of mainly uncultivated lands. D. Powell owned the 81 acres valued at £162. In 1930 and the property was in ruinate. The 70 acres owned by U. Edwards valued at £100 was also in ruinate.

Waterloo (Valley)

Historic Background

Waterloo Valley falls within the ambit of the historic Waterloo Pen.

Four owners are recorded for the year 1832. The executor of Elizabeth Fisher, the property having 12 enslaved persons. The Hon. George L. Tuckett had four enslaved persons and one head of stock. James Tulloch had 84 enslaved persons and 60 heads of stock. William D. Turner owned 11 enslaved persons and four heads of stock.

Table 3: Showing Land ownership in 1840 at Waterloo Pen

Waterloo Valley	Owner	Acreage
Waterloo Pen	Susanna Fletcher Ingram	486
	Samuel C Johnston	255'
	James Jones	130'
	William Johnston, House and shop	229'
	Thomas Johnston	24'
	William Johnston	83'
	Mary Johnson	158'
	Abraham Judah	80'
	Hannah Lane James	200'
	William Jackson	60'
	Brunetta Jarrett	86'
	John M. Johnson	100'
	Edward and E. K. Jackson	444 acres and 226'
	Elizabeth Kilbie Jackson	155'
	Henry James	124
	Robert May Jackson	260'
	Elizabeth James	254'
	Madam Jesron	200'
	Haughton James	300'
	James Johnston	300'
	Thomas Kirkpatrick	50 acres, 820'
	William George Kemp	60'
	King, Alexander, as guardian to James Ashley,	112'
	King, Alexander as guardian to C. King,	112'
	Charles Kinkead	45'
	Joseph Kilby	97'
	George H. Kerby	75'
	Caroline Lewis	127'

In 1845 S.F Ingram owned 485 acres at Waterloo Pen. Matilda Edwards owned 70 acres in 1912 valued at £105. Land usage was mixed cultivation but mainly uncultivated. In 1930 the 70 acres had increased in value to £140 and was used for grazing and a portion of the land was in ruinate.

Pinnacle Pen

Historic Background

Table 4: Showing Land ownership in 1840 at Pinnacle Pen

Pinnacle	Owner	Acreage
	Sir Joshua Rowe	221'
	Jane Reeves,	200'
	Mary Rickett	200'
	Elizabeth A Rose	264'
	Janet Rennalls	600'
	Johanna Rose	200'
	William Richards	200'
	Ann Catherine, & al Roberts	103'
	Rose Reid	250'
	James Studart Richards	55'
	Rev. G. W Rowe	235'
	Rev. M Randerson	200'

In 1845 A. Davis owned 121 acres at Pinnacle. William Cathcart owned 320 acres in 1882 which was in wood and ruinate. Mary L. Thomas owned 593 acres valued at £550 in 1912. There was some mixed cultivation but the property was mainly uncultivated. Pinnacle Pen was eventually subdivided and it was at Pinnacle that Leonard P. Howell set up the first Rastafarian village in the 1930s.

Cross Estate

Historic Background

In 1840 Porteous and Carson owned Cross Estate and Pen totalling 2000 acres. J. F. Socarras owned Cross Pen in 1882. Of the 980 acres, 33 were in coffee, 40 in Guinea grass, 72 in common pasture and pimento and 835 acres in wood and ruinate.

F. E. Silvera was the owner in 1912 (Stony View) of 980 acres valued at £994. The property was under banana cultivation.

Content

Historic Background

The district of **Content** was carved out of the Cross Estate and seems to be a post-emancipation settlement.

Table 5: Showing Land ownership in 1840 and 1845 at Content

Parish	Place	Owner	Date	Acres
St. Catherine	Content	Henry B. Shirley	1840	4 ½
St. Catherine	Content	Juliana Williamson	1840	89
St. Catherine	Content	W. Archer	1845	70
St. Catherine	Content	H. Husband	1845	50
St. Catherine	Content	M. McNab, estate of,	1845	150
St. Catherine	Content	J. Taws	1845	21
St. Catherine	Content	J. Angus	1845	16
St. Catherine	Content	A. Bell	1845	10
St. Catherine	Content	W. Bonner	1845	17
St. Catherine	Content	Diana Conie	1845	10
St. Catherine	Content	F. Diton	1845	20
St. Catherine	Content	J. W. Fraser	1845	10
St. Catherine	Content	J. Henry	1845	10
St. Catherine	Content	R. Johnson	1845	11
St. Catherine	Content	Catherine Marshall, executor of L.S. Roach	1845	29
St. Catherine	Content	A. Rennalls	1845	15
St. Catherine	Content	Elizabeth Richards	1845	19
St. Catherine	Content	R. Smellie	1845	10
St. Catherine	Content	Mary Smith	1845	330
St. Catherine	Content	G. King	1845	20
St. Catherine	Content	A. Knight	1845	107
St. Catherine	Content	Mary A. Montgomery	1845	22
St. Catherine	Content	W. Power	1845	11
St. Catherine	Content	T. Richards	1845	14
St. Catherine	Content	J. Robinson	1845	10
St. Catherine	Content	T. Richards	1845	12
St. Catherine	Content	Martha Swinhoe	1845	400

Rio Cobre River and Dam

Historic Background

Rio Cobre is Spanish for "Copper River". The river has changed course many times and some of these ancient courses can still be traced on the landscape. At one time it entered the sea at Great Salt Pond south of Port Henderson. At another time its mouth was at Galleon Bay near Old

Harbour Bay. The river has created many fertile alluvial valleys including St-Thomas-in-the-Vale and the areas around Spanish Town. Its waters have been used to provide electricity and to irrigate the plains (Senior 421)

Richard Hill (1855) noted:

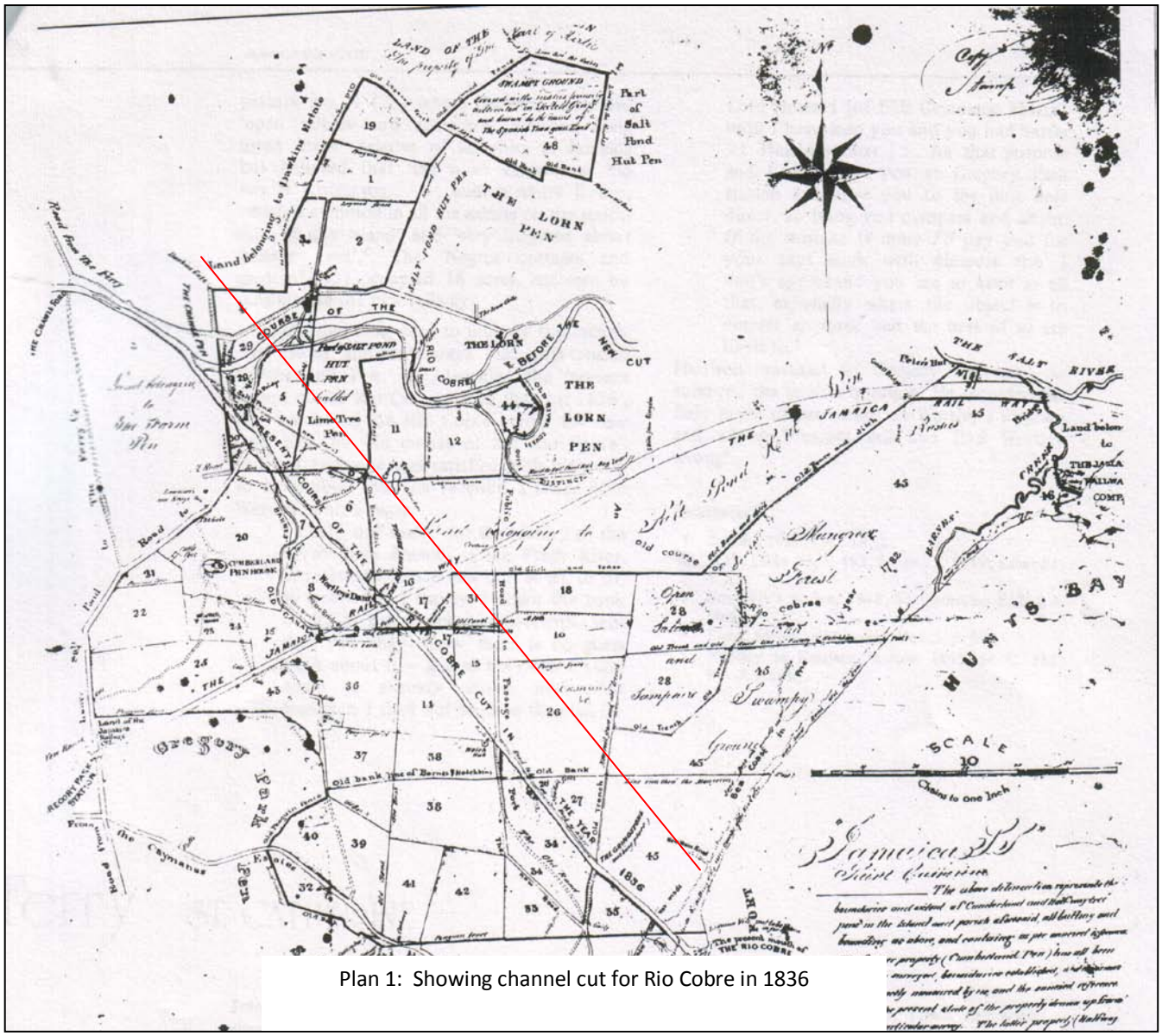
> The early maps of St. Catherine show that there have occurred deviations in the course of the Rio Cobre that are not easily reconciled by abundant rains. Antecedent to the discovery of the West Indies, the embouchure of the river was perceptively in the ponds, shut in by the narrow belt of land on which Fort Augusta stands, the river having been at that time more of a surface stream, and striking to *the sea due south; the outlet curving northward,* and embaying Passage Fort . At the time of the conquest of the island by the English the river flowed in an opposite direction *due north,* coursing the foot of the Caymanas Mountains, and making the present lagoons in the upper part of that plain its channel, seeking the *sea southward,* through what is now an independent stream called the Ferry River (Fresh River). In 1722, in the midst of an extraordinary rain-storm, this channel was suddenly quitted, and a straight line made *eastward.* The settling waters, as they reached the Harbour of Kingston, impeded by the easterly winds, regurgitated through the lakelet into which they gathered themselves, and digging out the soil at the foot of the mountains, made the present lagoons, increasing the sea-board lands of Hunt's Bay 3000 feet (three thousand).

In 1836 a new channel was cut for the Rio Cobre with the mouth at Passage Fort.
The new channel caused silting at Passage Fort eventually causing the demise of that town. Underhill (1862) noted:

> The river runs in a channel cut a few years ago in order to drain the swamp near Kingston, formed by the sand-banks that the sea constantly threw up at its embouchure into the harbour. The new channel, however, silts up as much as before. The waters now flood the village of Passage Fort, and cut off the chapel, the floor of which they often invade, from the use of the people.

In 1946 **Caymanas Estates** bought the 4,000 acre **Cumberland Pen** property for £70,000; they put most of it into sugar cane to feed their new sugar factory. **Caymanas Estate** built a bailey bridge (called the **Crum Ewing Bridge**) over the **Rio Cobre** to take the cane from Cumberland across the river to the Caymanas sugar factory, which also gave residents convenient access across the river without having to travel to **Spanish Town**. In the late 1960s a dyke was built to canalize

the **Rio Cobre** in advance of the **Portmore** development; the wetlands around **Passage Fort** were filled in such that the former seaside settlement was now inland.



Plan 1: Showing channel cut for Rio Cobre in 1836

RIO COBRE DAM

Sir John Peter Grant (1807-1893), Governor of Jamaica (1866-1874), had the idea to irrigate the St. Catherine plains to increase agricultural productivity and production. In 1870 while in England on holiday, he secured the services of Mr. G.A. Hutchins, a civil engineer who had acquired experience in the vast irrigation works of India, to make a survey and to design the **Rio Cobre**

Irrigation Canal system; his design called for a large dam, a main channel about 3 miles long and 4 separate branches: to **Old Harbour Market**, **Caymanas**, **Port Henderson** and the **Great Salt Pond**; this would cost £60,000 and would irrigate 43,000 acres. Construction began in late 1872 and was completed in June 1876 at a cost of £120,000 (including land acquisition); it paid for itself many times over. The weir is 30 ft above the head of the river, and it has a clear overfall of 287 feet (Espeut forthcoming).

Plate 6: Concrete Pipe Saddles
Source Henry Holgate Album
National Library of Jamaica

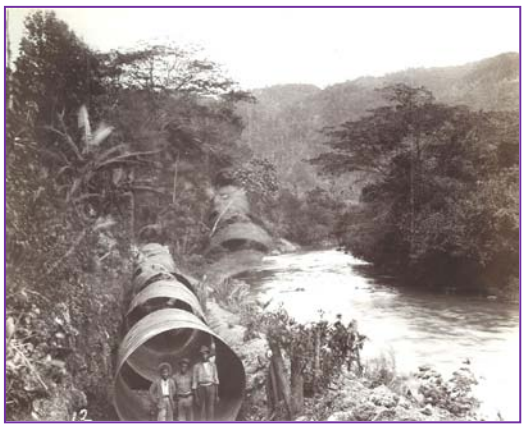


Plate 7: "Guess dere be no ribbah when de pipe full"
Source Henry Holgate Album
National Library of Jamaica

Plate 8: "The largest pipe in the world 6200 feet long 96in diameter 1700000 1lbs"
Source Henry Holgate Album
National Library of Jamaica

Plate 9: Dam in progress
Source Henry Holgate Album
National Library of Jamaica

(The) Crescent

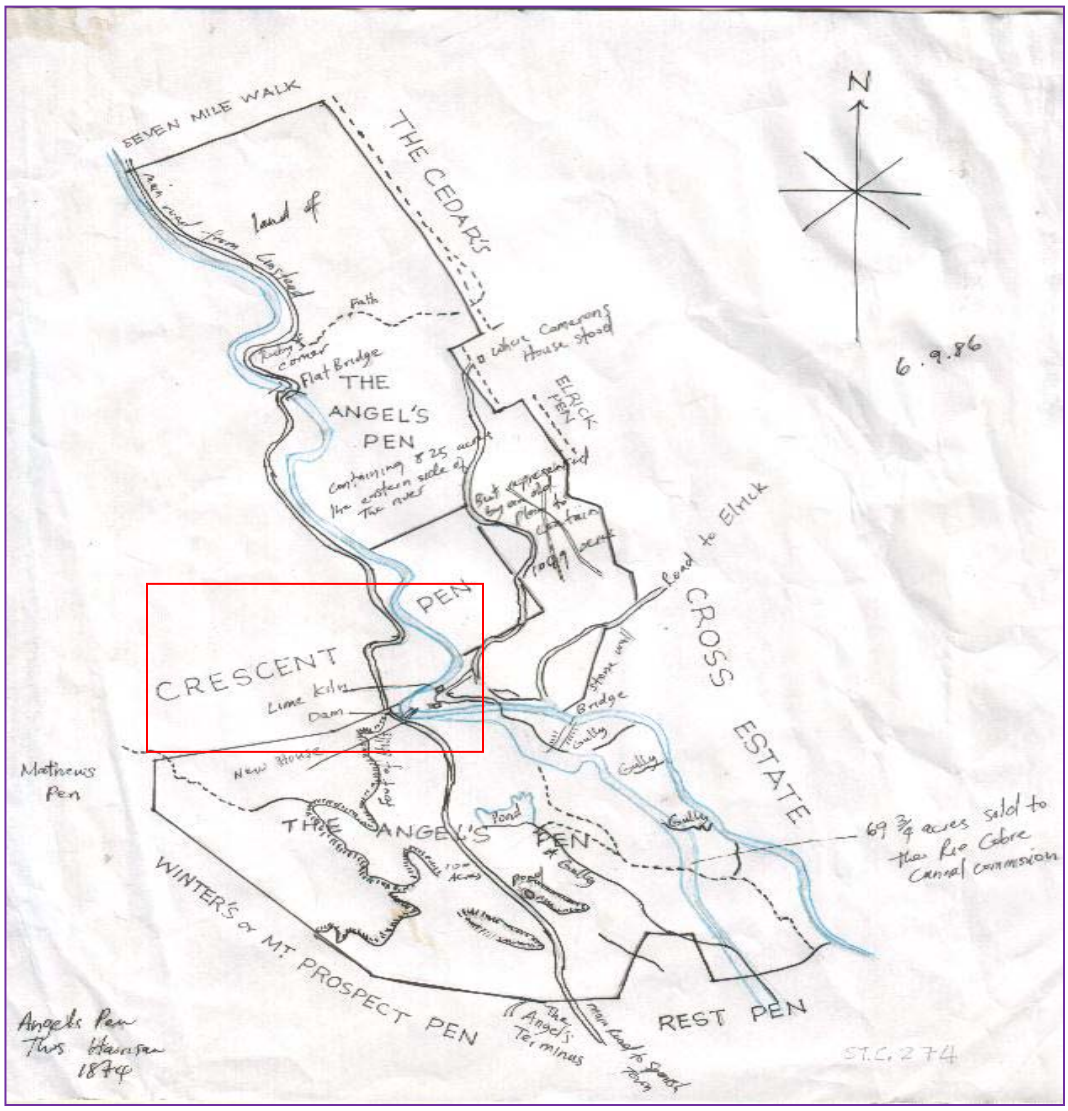
Historic Background

Crescent is the English corruption of the Spanish *Crescente*- Castilian- "*Cresthiente*".

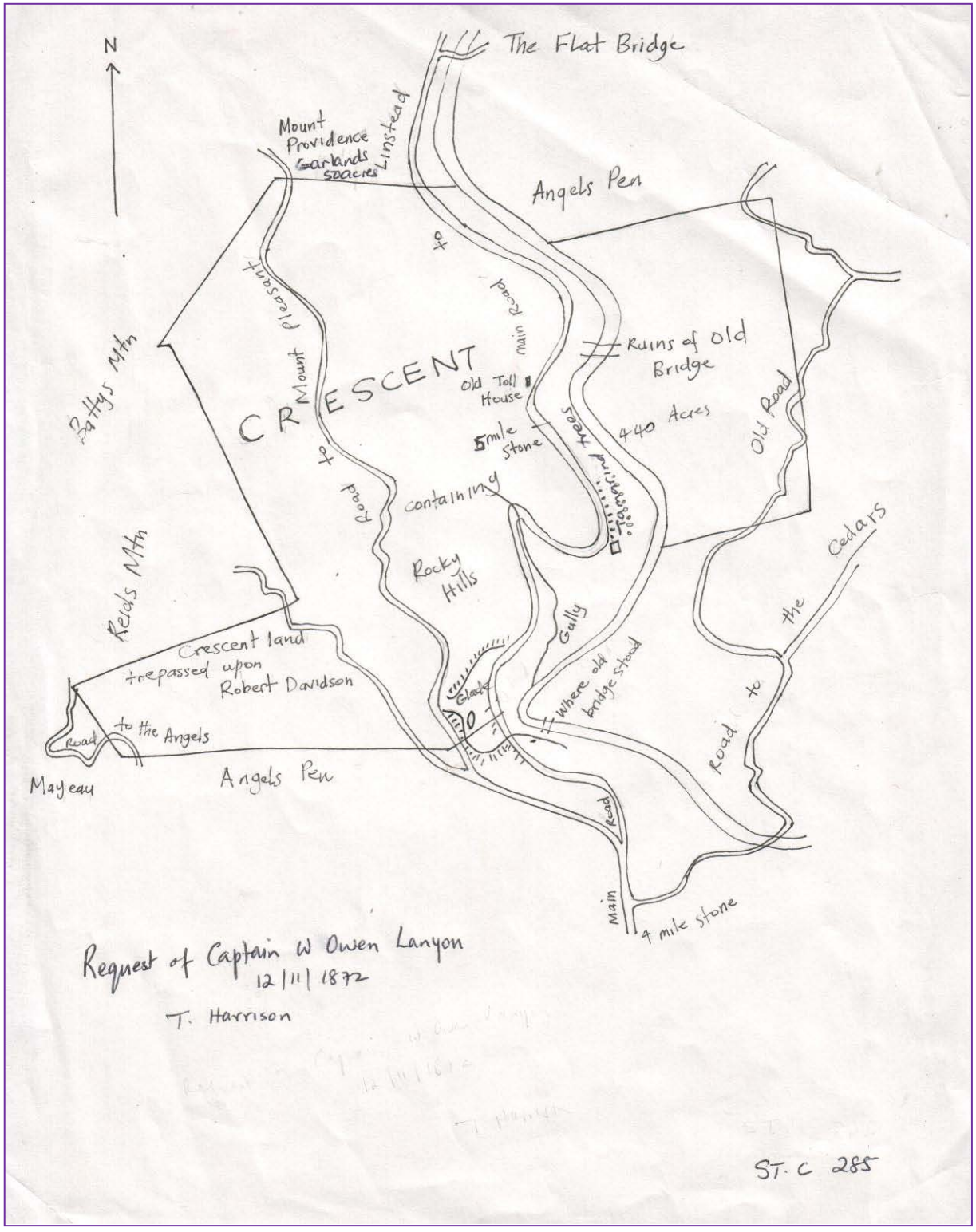
Emmanuel Bowen's map of 1747 shows an animal mill at "Crefsen" (Crescent). This meant that the estate was in sugar production at this date. In 1840 Porteous and Carson was the owner of Crescent.

Map 5: Showing sugar mill at Crescent in 1747

Thomas Harrison in 1874 records Crescent as a Pen with features such as a lime kiln, house and the Rio Cobre Dam (See Plan 2)



Plan 2: Showing Lime Kiln, house and dam at Crescent Pen in 1874



Plan 3: Crescent 1872 showing old Toll House, house in row of tamarind trees and old bridge

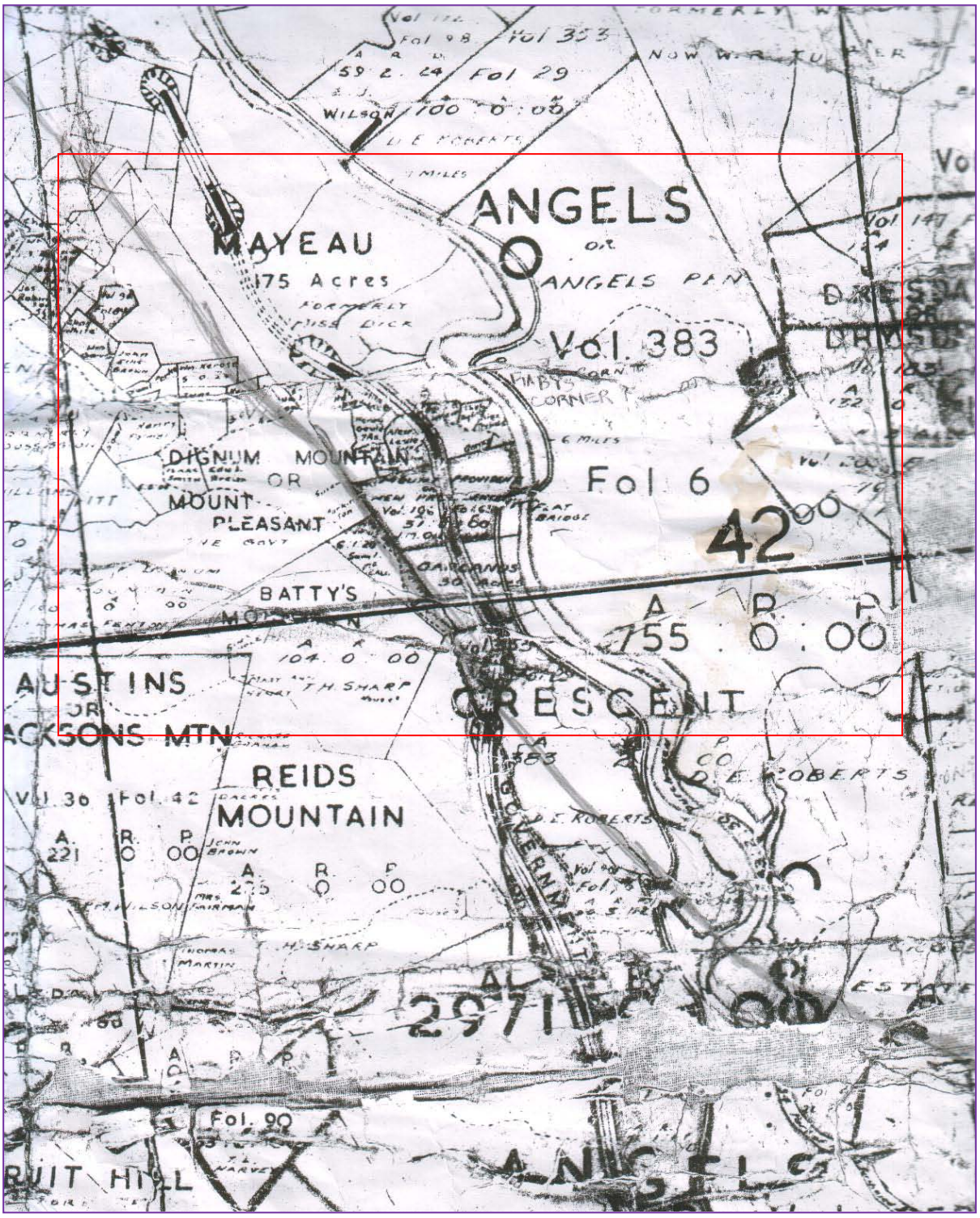
Dignum Mountain or Mount Pleasant (related to Dignum)

Historic Background

A.G. Dignum owned 446 acres in 1840 whilst James Swaby had 1180. One hundred acres of Dignum Mountain was owned by William Fenton in 1882 the rest was occupied by small settlers. In 1912 the 100 acre property was valued at £208, and was mainly uncultivated. In 1930 it was valued at £300 and in ruinate.

Table 6: Showing land ownership in 1840 at **Mount Pleasant**

Mount Pleasant	Owner	Acreage
	James Swaby	1180
	William Garvey Clarke	341
	Jane Clarke	144
	Le Ray de la Clartais, estate of	106
	Maria Cowan	434
	Thomas Chambers	21
	William Campbell, executor of Cole,	170
	Jane Elizabeth Castillo	10
	Elizabeth Jennings Castillo	5
	John Conner	10
	William Conner	20
	Robert Conner	10
	Alex Conner	6
	John Cooper	11
	W. S. Cruickshank	66
	Joseph Edward Cruickshank	50
	George Edward Cruickshank	50
	Alexander Scott Cameron	50
	James Cameron	400
	William Page Clarke	200
	Ann Robert Conner	50
	Susanna Cumming	20
	William Coulson	50



Map 6: Extract from Thomas Harrison's Map of 1882 showing Dignum Mountain or Mount Pleasant, Crescent and surrounding communities

Gibraltar

Historic Background

In 1810 Rebecca Sanguinnetti is listed as the owner of the property with 23 enslaved persons and five heads of stock. By 1840 Smith & Williams owned the 515 acre property. In 1844 J. Harker owned the 500 acre Gibraltar property. By 1882 the properties of Giblatore and Gibraltar had been amalgamated into one 1418 acre entity. In 1930 275 acres of Gibraltar, Giblatore and Archdeckne is recorded as non-taxable properties and was in woodlands.

Giblatore

Historic Background

The invading soldiery of Cromwell's Army corrupted all the Spanish names. The high cliff is called "Giblatore"- The Gibraltar of the Spanish colonists Smith and Williams owned 515 acres in 1840. D. Smith owned 237 acres and Maria and James Smith owned 20 acres in Giblatore in 1844.

Harker

Historic Background

The settlement of Harker seemed to have been cut from the 500 acre Gibraltar property owned by J. Harker in 1845.

Bowerwood

Historic Background

In 1840 William Lord is listed as owning the 243 acre property. James Long owned 144 acres, Catherine Lorrain 54 acres, Johanna Laurence 284 acres and Isabella Leith had 272 acres. By 1845 the property is retuned as having 239 acres with William Lord as owner.

Content

Historic Background

In 1840 and 1845 a number of persons are listed as owning land at Content in St. John

Table 7: Showing land ownership at Content in 1840 and 1845

Parish	Place	Owner	Date	Acres
St. John	Content	George Ashley	1840	6
	Content	William Martin	1840	400
St. John	Content	G. Ashley	1845	13
	Content	R. Anderson	1845	20
	Content	E. Anderson	1845	20
	Content	E. Brown, trustee	1845	17
	Content	Sarah Blake	1845	10
	Content	Maria Cowan	1845	500
	Content	A.M. Dillon	1845	90
	Content	Jane Davidson	1845	20
	Content	Mary Dawkins	1845	20
	Content	Jane Dehany,	1845	160
	Content	J. Geoghegan	1845	13
	Content	W. Hay	1845	20
	Content	R. Hay	1845	20

Wakefield

Historic Background

The estate of Wakefield spread into two parishes namely St. Thomas-in-the-Vale and St. John. In 1739 five works were in operation at Wakefield. The one belonging to the heirs of Oldfield produced 110 hogsheads of sugar, 70 hogsheads of sugar was produced for Thomas Sams heirs, Barrow Harris works returned 60, whilst John Browne made 30 and that belonging to Williams and Foster produced 30. By 1810 Dr. M. Mackenzie owned Wakefield with 111 enslaved persons and 25 heads of stock. James McDonald and G. W. McKay are recorded for 1832 with eight enslaved persons. Robert Fairweather was the owner of the 2250b acre estate in 1840. In 1845 the 2250 acres belonged to R.C. Burke whilst H.D. Smith owned 20 acres.

McDowell, Hankey and Co owned Wakefield in 1879. 300 acres was in canes, 1,600 in grass, woodland and ruinate. The method of sugar production was by steam, open battery and Aspinal Pan. The estate produced 120 hogsheads of sugar and 149 puncheons of rum for the crop 1879-80. The crop for 1880 was 135 heads of sugar and 149 puncheons of rum. The estate was owned by Honourable J. H. McDowell with 305 in cane cultivation and 1,595 in grass, woodland and ruinate. In 1888-89 the estate produced 135 hogsheads of sugar and 132 puncheons of rum.

By 1912 there was disintegration of the estate with Allan D'C Levy owning 216¾ acres valued at £1000 and land used for cattle pen. C. E. Randall had 77¼ acres valued at £650 and he also operated a cattle pen. The Salvation Army had 310¼ acres valued at £1,200 which also was used for cattle grazing. A cattle pen was on the 615 acres valued at £2000 belonging to A. C. Westmoreland. Marie L Jacobsen owned the 391¼ acres valued at £940 and this was mainly rented to tenants.

In 1918 A. C. Westmoreland had 500 acres in grass and common, 115 other and 400 heads of cattle. By 1919 594 acres were grass and common, 21 other acreage and 260 heads of cattle.

Several owners are recorded for the year 1930:

- John E. Weatherly had 102 ½ acres valued at £300 with land usage as pasture and ruinate.
- John Parodie with 216 ¾ acres valued at £950 with land usage as cultivation and pasture.
- Marie L Jacobsen had 165 acres valued at £50. The property was in woodlands.
- Violet V. Coote had 77 ½ acres valued at £500, with land usage as pasture and ruinate.
- G Phillips owned 308 ¼ acres valued at £1000 with land usage as pasture and ruinate.
- Percy and Rose Mary Westmoreland had 615 acres valued at £2,240 with land usage as grazing pen.

In 1944 Dermott McConnell owned property at Wakefield, 254¾ acres was in grass and common, 73 acres is recorded as other and the property had 100 heads of cattle.

Map 7: Extract from Craskell and Simpson's map of 1763 showing sugar works in St. Thomas Y vale

Cambria/ Cambrian

Historic Background

Cambria was originally a part of the Wakefield Estate (See Map 8). Fernando Cohen owned the 415 acre property in 1882. 54 acres were under coffee cultivation, 11 acres in ground provisions, 10 acres in guinea grass, 30 acres in common pasture and pimento, 272 acres in wood and ruinate. In 1881 13 treceis of coffee was produced. In 1898 28 acres was in cocoa.

In 1912 F.H Delisser owned the 420 acre plantation valued at £2,500. The land was under banana and cocoa cultivation. By 1919 E.H. Dyer had 46 acres in cocoa. E. H. Dyer is recorded as owning 261 acres in 1930 valued at £2,133. The property was in cultivation and ruinate. Allan M. Bryson also owned 82 acres in 1930 valued at £550. This was in cultivation and pasture.

Heathfield

Historic Background

In 1840 Elizabeth Clarke owned the 100 acre Heathfield property. By 1845 the 100 acre property was in the hands of J. Mais. Edward McCaw was the owner in 1882 the acreage was 115 with one acre in ground provisions, two in common pasture and pimento, 72½ acres wood and ruinate, 39½ acres were rented out. In 1912 Robert March owned the 122 acres valued at £1000. Land usage was mainly residential and grazing. A. A. Green owned the property in 1930. The 106 acres was valued at £1,060 and used for pasture.

Banbury

Historic Background

In 1810 Banbury was owned by John Henderson. The property possessed 101 slaves and 47 heads of cattle. Edbury and Roach owned the 1064 acre Banbury property in 1840. By 1845 there was fragmentation of the property. In 1845 the following persons are listed: S. Edbury with 317 acres, E. Williams with 11 acres and T. Edbury possessing 436 acres in the parish of St. John. G. J. Evelyn owned 408 acres in 1882 and this was in wood and ruinate. In 1912 J.E. L Cox owned 132½ acres valued at £320 and this was in ruinate. Richard Harrison had 242 acres valued at £600 and his

property was used as a grazing pen. The Estate of A. A. Green owned 104 acres valued at £637 in 1930. This was used for pasturage.

Linstead

Historic Background

Rodney Hall was the capital town of the parish St. Thomas-in-the-Vale and this area eventually became Linstead. In 1810 Rodney Hall was owned by William Moore with 80 enslaved persons and 20 heads of cattle. Thomas Edbury & Co. owned 50 acres at Linstead in 1840. S. Edbury owned 15 acres at Linstead in 1845 and P Blackburn had 50 acres at Linstead Villa and Cottages.

The Railway

Historic Background

The Jamaica Railway Company was incorporated in 1843 and the line was open for traffic on November 21, 1845.The Spanish Town to Ewarton line was opened on August 17, 1885.

Rose Hall/ Vanity Fair

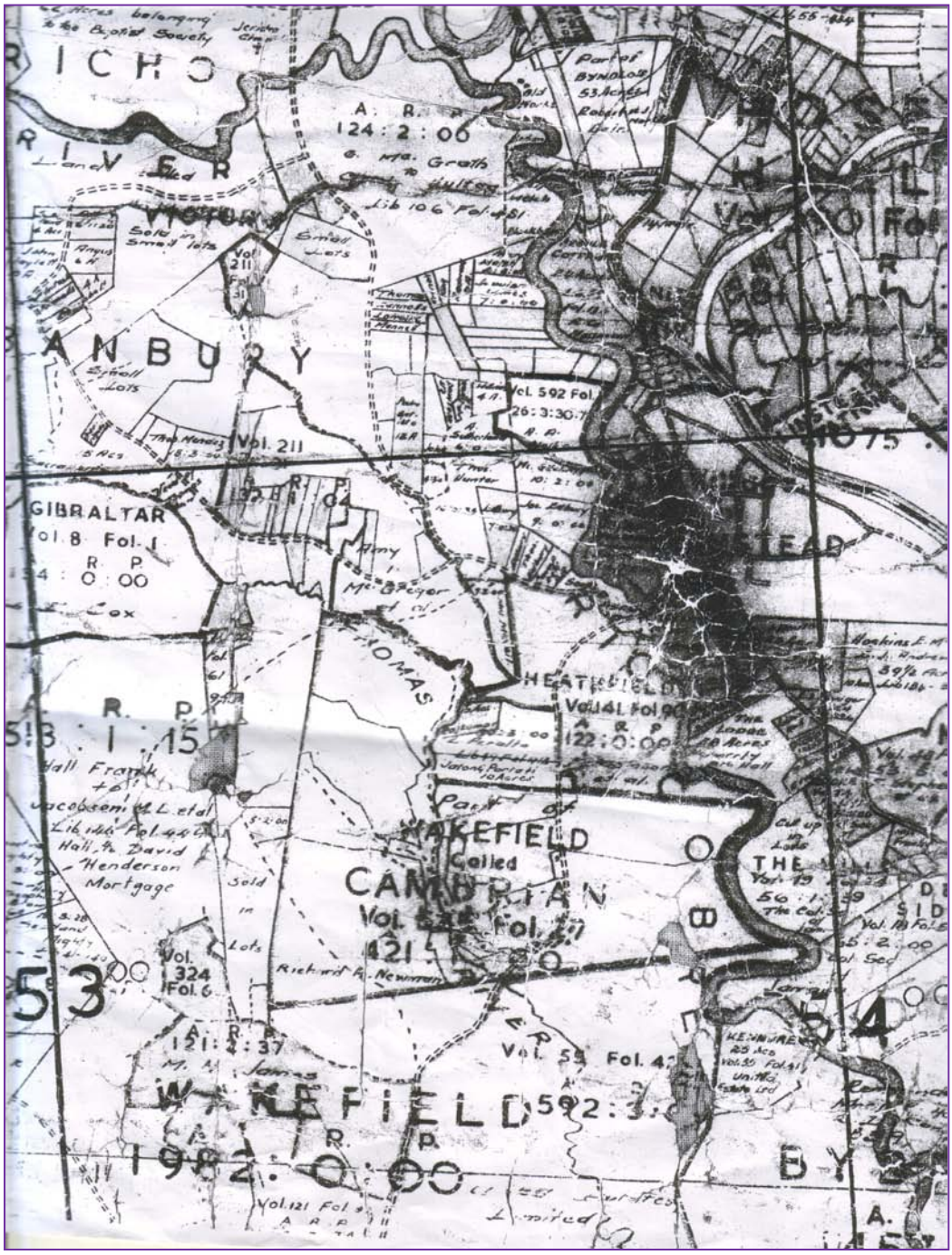
Historic Background

The communities of Linstead and **Vanity Fair** are all sited on the Rose Hall estate.

Byndloss

Historic Background

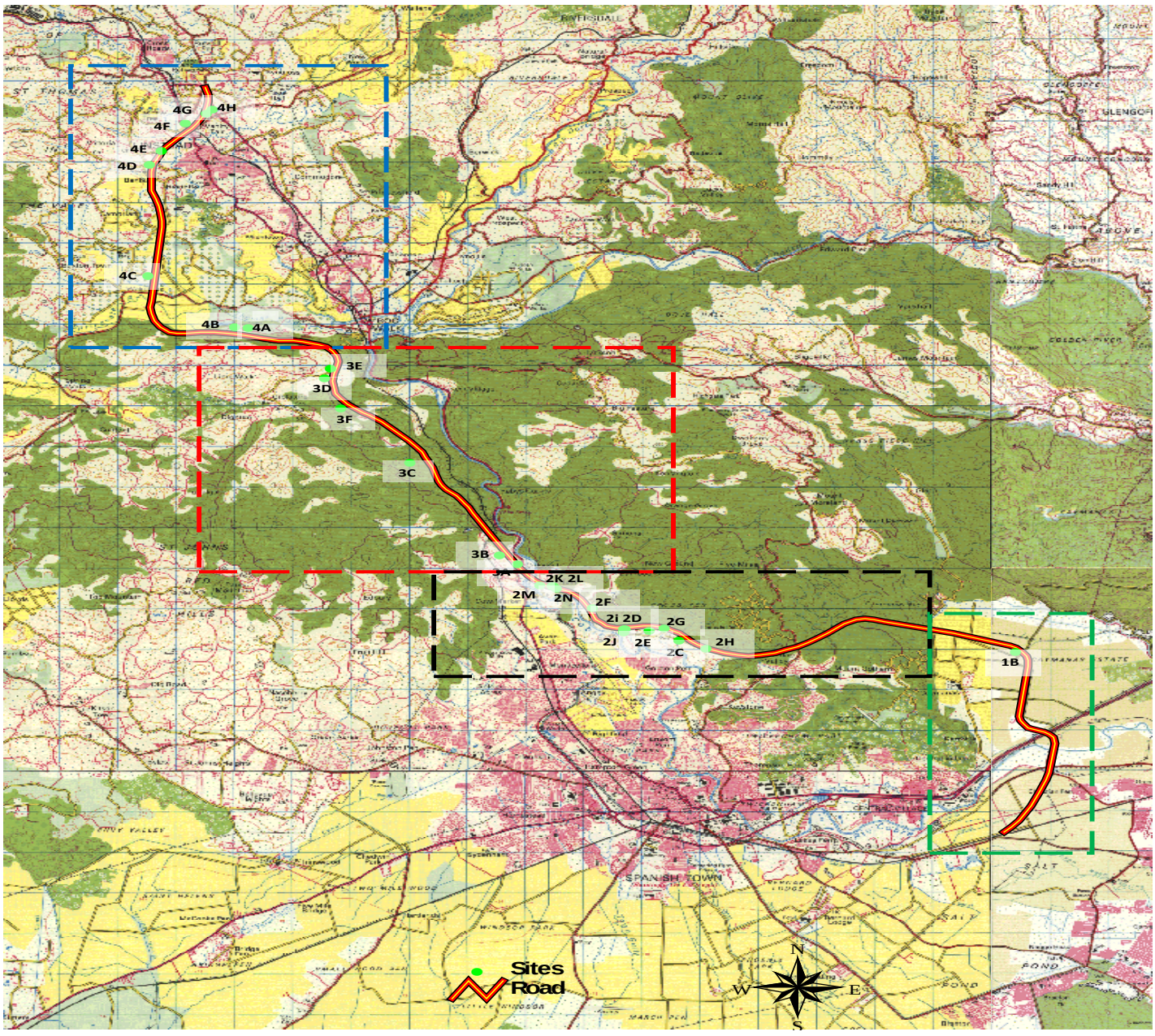
In 1810 Henry Marshall owned Byndloss with 128 enslaved persons and ten heads of stock. Robert Allen was the overseer on Byndloss in 1824. The estate produced 143 hogsheads of sugar and 57 puncheons of rum. Sixteen heads of old cattle was sold for hogsheads £117.10s. John Dand in 1832 with 162 enslaved persons and 30 heads of stock. In 1840 the property measured 1551 acres. The property was owned in 1845 by R. Allen. In 1882 the 902 acres property belonged to George McGrath and it was in wood and ruinate.



Map 8: Extract from Thomas Harrison's map of 1882 showing estates in St. Thomas Y Vale

6. SITE ASSESSMENT RESULTS

Significant heritage sites identified along proposed alignment



Map 9: Showing significant sites identified and the Zones – Zone 1 outlined in **green**; Zone 2 in **black**; Zone 3 in **red**; and Zone 4 in **blue**

Zone 1

Zone 1 is sited on an alluvial plain where the sugar cane-fields belonging to the Caymanas Estate is located. The Caymanas Estate encompasses three historic sugar estates namely Ellis, Taylor and Dawkins.

Caymanas- Zone 1a

The eastern end of the proposed highway joins the Mandela leg of Highway 2000 at Dawkins Crossing at reference point 749561.3800E 648788.4100N.

Plate 10: Showing a section of the Portmore leg of Highway 2000 from the Caymans Sugar Estate lands

The proposed road alignment will traverse several acreage of the Caymanas Sugar Estate lands. It should be noted that at the time of the survey the sugar cane was in varied stages of development from just planted to being reaped.

The soil in the cane fields is light brown clay loam with angular limestone gravel with the gravel averaging 5% per square metre.

Plate 11: Showing the texture of the soil which was common throughout the cane fields

The vegetation cover in this zone consists mostly of sugar cane (*Saccharum officinarum).* Throughout the fields trees are used as windbreaks namely baby tamarind (*Pithhhhecellobium arboreum),* and guango (*Samanea saman*). A line of mango (*Mangifera indica)* trees is in the vicinity of the farm and a grove of coconut *(Cocos nucifera),* trees is north of the farm. The vine coralita *(Antigonon leptopus)* is present in some areas of the cane-fields. Other vegetation includes acacia (*Acacia tortuosa*), African tulip (*Spathodea campanulata),* cassia (*Cassia L),* Guinea grass (*Panicum maximum),* palm (*Palmae spp.)* and wild cane (*Gynnnerium sagiittatum).*

To the west of the proposed alignment is a farm comprising a mixture of buildings dating from the 18th to the 20th Century which include ruins of the old Dawkins estate, stables and pens.

Plate 13: Showing horse stable

Plate 12: Showing the remains of Dawkins Estate and current farm

The proposed alignment will traverse the cane fields and property roads.

Plate 14: Showing where the proposed alignment will traverse through cane field

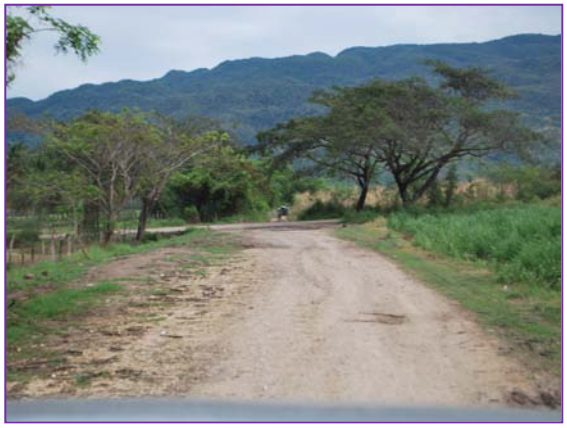


Plate 15: Showing where the proposed alignment will traverse through cane road

Zone 1b

At reference point 760541.97E 653211.95N a mixture of Taíno and European artefacts were found scattered throughout a cane field (See Plates 15- 19 Taíno Site 1 - (1b)

Plate15: Showing area where the assemblage of artefacts were found Taino site 1

Plate 16: Showing the Archaeology team doing a field walk survey of the area in search of artefacts

Plate 17: Showing Taíno artefacts on the surface

Plate 18: Showing slipware sherd *in situ*

Plate 19: Showing a white clay smoking pipe bowl sherd on the surface

The Old Works for March's Bog was located in this vicinity, hence the presence of the European artefacts. Canals, locks and a pumping system which made up the irrigation works are to be found throughout Zone 1.

Plates 20-21: Showing irrigation system

Zone 1c

The proposed highway will cut through cane fields, a clump of palm trees that could have included dwellings in the past, marsh and the road leading to Caymanas Bay (See Plates 22 and 23).

Plate 22: Showing cane fields. In the background of Plate … is the Caymanas Golf and Country Club housing development

Plate 23: Showing a clump of palm trees where a structure may have been

Zone 2

Zone 2 starts to the immediate west of the Caymanas Bay road crossing the hills at an elevation of 61 m (200 feet) above sea level.

Plate 24: Showing area where the proposed alignment will cut across the road leading to Caymanas Bay and then through the mountain close to the high tension power line

Mount Gotham/ Taylors Mountain- Zone 2a

According to the archival record Mount Gotham is a historical place with a house located at the top of a hill.

Plate 25: Showing a member of the Archaeology team walking along the disused road towards Mount Gotham

Plate 26: Showing where the proposed alignment will traverse through the area

Waterloo Valley - Zone 2b

The proposed highway will cross the main road leading to Sligoville 756827.140000E 653357.270000N then will proceed east through the hills to Mount Gotham. Waterloo Pen House is indicated on a map. Time did not allow for the positive identification of this feature on the ground.

Plate 27

Plate 28

Plates 27-28: Showing where the proposed alignment will cut across the main road at Waterloo Valley leading to Sligoville

Cross Pen

The highway will traverse the district of Cross Pen. Two Taíno sites were identified at reference points 754790.965E 653509.481N (2c) Taíno Site 2 and753855.64E 653790.81N (2d) Taíno Site 3 respectively.

Plate 29: Showing Taíno pot sherds on the surface at Taíno site 2

Plate 30: Showing Taíno pot sherds on the surface at Taíno site 3

Approximately 52 houses including a number of modern and unfinished houses and the historic

The Great House compound will be affected by the proposed highway. Most of the unfinished houses are to be found at Obama Heights reference point 754260.52E 6537238oN (2e).

Plate 31: Showing house that is in direct path of the proposed alignment

Plate 32: Showing house with cut stone foundation in the yard at reference point 753288E 654302.37N (2f)

Plates 33-34: Showing a unfinished housing development in Obama Heights that will be affected by the proposed alignment

The houses at Cross Estate are located in a narrow valley with karst limestone hills rising to the north and the Rio Cobre River to the south. According to Messrs. Russell and Cox caves are to be found in the hills. Agriculture is the main stay of the community and the houses are surrounded by tree crops which include ackee *(Blighia sapida*), West Indian cherry (*Malpighiaceae punicifolia)*, coconut, guava *(Psidium guajava)*, mango (*Mangifera indica)*, naseberry (*Manilkara zapota),* orange (*Citrus L.)* and sweetsop (A*nnona squamosa)*. Crops grown include banana (*Musa sapientum)*, calaloo (*Amaranthaceae spp.)*, cassava (*Manihot utilissima)*, coco (*Xanthosoma sagittifolium*), corn (*Zea mays)*, gungo peas (*Cajanus cajan)*, okra (*Abelmosshus esculentus),* pak choy (*Brassica rapa*), plantain (*Musa paradisiacal)*, sorrel (*Hibiscus sabdariffa*) and yam (*Dioscorea* L.). Natural vegetation includes cassia and guinea grass, guango and elder yellow (*Tecoma stans).*

Plate 35: Showing houses in Cross Pen that would be indirectly affected by the proposed highway

An abandoned factory is at reference point 754529.15E 653799.54N (2g).

Plate 36

Plate 37

Plates 36-37: Showing abandoned factory and house that will be affected by the alignment

A quarry from which stones are being mined for road works at the Palisadoes is at reference point 755231.29E 653286.04N (2h).

Plate 38: Showing a quarry that would be affected by the proposed highway

Two National Water Commission (NWC) pumping stations are in the area one is located at reference point 753831.88E 653705.96N (2i)

Plate 39

Plate 40

Plates 39-40: Showing National Water Commission (NWC) pumping stations that would be affected by the proposed alignment

The Great House ruin and compound lies at reference point 753831.8800E and 653705.9600N (2j)

Map 10: Showing location of Great House at Cross Pen Estate


Plate 41


Plate 42

Plates 41-42: Showing the type of vegetation that is found in the Cross Pen area

Content

The district of Content lies to the immediate east of the Rio Cobre Dam. Approximately 35 houses, a shop and one mini mart, two cemeteries, two pump houses, one water main and a Taíno site are in the path affected of the proposed road alignment. The fairly large Taíno site is at reference point 752592.51E 654826.84N (2k)


Plate 43


Plate 44

Plates 43-44: Showing Taíno artefacts on the surface at Taíno site 4


Plate 45


Plate 46


Plate 47


Plate 48


Plate 49


Plate 50

Plates 45-50: Showing some of the dwellings and commercial building that would be directly affected by the proposed highway

Two cemeteries lie in the direct path of the proposed alignment (2l and 2l1).

Plate 51: Showing a cemetery at grid reference 752621.895E 654825.926N that would be in direct path of the proposed alignment (2l)

Plate 52: Showing a cemetery that would be in direct path of the proposed alignment (2l1)

Two pumping stations reference point 752396.637E 654851.488N (2m) and (2m1) and the historic pipeline reference point 752669.340E 654784.443N (2n) laid in 1872-1876 carrying water from the Tulloch Spring to the Corporate Area are in the path of the alignment.

Plates 53-54: Showing two pumping stations that will be affected by the proposed alignment

Plate 55: Showing a historic pipe line which will also be affected by the proposed alignment

A well defined path at reference point 752226.41E 654002.06N (2o) leads from the village to the fording at the dam. The alignment crosses this and the historic access roadthat led from the old Fording to Elrick.

Plate 56: Showing a path leading to dam

Vegetation cover consists of natural and domesticated plants such as acacia, ackee, almond (*Termindia catapa)*, castor oil (*Ricinus communis)*, banana, coconut, mango, naseberry and sugarcane.

Plate 57

Plate 58

Plates 57-58: Showing the vegetation of the area

Rio Cobre Dam

The proposed highway will cross just north of the Rio Cobre Dam. The path that leads to the fording lies on the eastern bank of the dam.

Plate 59

Plate 60

Plates 59-60: Showing view of the dam and residents from Content crossing the lower section to get to Angels

Zone 3

Crescent

The highway will traverse the district of Crescent. It cuts directly through the centre of the community. The present houses consist primarly of modern concrete wall dwellings (See Plates 63-66). Two Taíno sites were identified at reference points: Taíno Site 5 - 752004.8800E 655371.6200N and Taíno Site 6 - 751703.1000E 655604.0300respectively (3a and b). It is being speculated that these three sites may have been linked to create one large Taíno settlement.

According to the archival records the community is a historical place that had an animal mill located on the western banks of the Rio Cobre close to the current settlement (See Map 8). The cutting of the road and subsequent development seems to have obliterated the remains of the works although faint traces of what appears to be foundation was identified.

On the western bank of the Rio Cobre the archival record shows a lime kiln and pipeline. The pipeline is extant but the lime kiln needs to be positively identified.

Plate 61: Showing the location of Taíno Site 5

Plate 62: Showing Taíno bowl sherd on the surface at Taíno Site 5

Plates 63-64: Dwellings that will be directly impacted by the proposed highway

Plate 65: Showing the location of Taíno Site 6

Plate 66: Showing a small church that would be affected by the proposed highway

Dignum Mountain/ Mount Pleasant

A Taíno site was found in the vicinity of the satellite towers at reference point 750152.095E 657875.923N (3c). Dense vegetation cover and the rugged terrain impeded the field survey at this point. A fairly large settlement is at Dignum Mountain (See Plate 68). The highway crosses the railway line in this vicinity.

Plate 67: Showing the location of Taíno Site 7

Plate 68: Showing the view of Dignum Mountain settlement from Crescent some of these dwellings will be affected by the proposed highway alignment

Harker

The settlement of Harker lies between Gibraltar, Giblatore and Jew Pen and is situated in the proposed highway alignment. A number of houses are present at Harker reference point 748685.94000E 659959.60000N (3d) the majority of which are modern but from the archival record the community is a historical place. A few historical wooden structures and historical artefactual assemblage speaks to the historical integrity of the site (See Plates 70 and 71). Most of the people are unemployed and rely heavily on agriculture (See Plates 73 and 74). Crops grown include banana, cassava, okra and sorrel. Tree crops include ackee, cocoa (*Theobroma cacao L.)*, coconut, guava, jackfruit *(Artacarpus heterophyllus)*, mango and orange.

According to some community members the cultivation of cassava is a long standing staple crop of the area. Cassava was a staple crop of the indigenous Taíno and the cultivation of this crop shows continuity from the past to the present, especially in light of the fact that a huge Taíno site is located at reference point 748808.16200E 660188.13100N (3e) in the community.

Plate 69: Showing type of house found in the area

Plate 70: Showing wooden house

Plate 71: Showing Taíno artefacts *in situ*

Plate 72: Showing area where the artefacts were found

Plate 73

Plate 74

Plates 73-74: Showing small farms

The area has many low lying hills. Natural vegetation in the area includes Blue Mahoe *(Hibiscus elatus)*, Guinea Grass and Trumpet (*Cecropia pelltata)*.

Puss Gully Gibraltar

The proposed highway traverses large tracts of woodland passing through the historic Gibraltar plantation. The area is cultivated by people from the surrounding communities. Pieces of Taíno pottery sherds (See Plate 76) and European ceramics cut stone foundations and the section of a cut stone retaining wall were identified at reference point 749031.65E 659282.86N (3f).

Plate 75: Showing small cassava farm

Plate 76: Showing the location of assemblage of artefacts

Plate 77: Showing the clearing of a cut stone foundation

Plate 78: Showing the location a cut stone wall

There are well defined paths leading into the woodlands. The road will cross several defiles and valleys. Dense vegetation cover and the rugged terrain impeded the field survey but there remains the possiblity that other historical features may be in the bushes.

Plate 79 Showing the team walking along a path at Puss Gully

Plate 80: Showing the mountainous terrain, the road will cut through the valley

Zone 4

Wakefield

The proposed highway alignment will traverse the Wakefield property via a property road south of the Thomas River. At this juncture it passes through dense woodland with pockets of grasslands.

Plate 81

Plate 82

Plates 81-82: Showing where the proposed highway will traverse

Two areas of cultural activity were recorded in the Wakefield cane fields. At reference point 747395.26E 661202.41N (4a) Taíno pottery sherds were identified. At reference point 747165.83E 661219.20N (4b) in a newly planted cane field an assemblage of artefacts which included Taíno pottery sherds, smoking pipe stems, ceramic and a piece green glass bottle base were found (4b). Vegetation cover at this point included ackee and mango trees. The presence of such trees is an indication that the area at some point in time was occupied. The highway will cut through the Giblatore hills. It crosses the Thomas River and travel along and close to the existing road into

the district of Cambria. A large property house west of the road will be affected by the proposed alignment.

Plate 83: Showing where the road will cut through cane field which is also Taíno site 9

Plate 84: Showing an Archaeological Field Assistant retrieving artefacts from site

Plates 85-86: Showing artefacts on the surface including Taíno bowl sherd and smoking pipe stem

Cambria / Cambrian

At Cambria the proposed highway alignment will affect farm buildings at reference point 745675.94E 662471.18N (4c), sugar cane and orange fields, cattle pen and pastures and a few houses.


Plate 89


Plate 90

Plates 87-90: Showing Farm house, Pasture and fields that will be affected by the proposed highway

Heathfield

The proposed alignment will veer to the east at Heathfield. Though not exactly in the alignment The Mainland Chicken factory complex was noted .


Plate 91


Plate 92

Plates 91-92: The proposed highway will pass close to this section of Heathfield

Banbury

A number of buildings both residential and commercial will be affected located at reference point 745691.13E 665225.15N (4d). Another block of houses at reference point 745898.69E 665551N (4e) are sitting in the centre of the proposed alignment. The proposed alignment will also pass through a coconut farm.


Plate 93


Plate 94

Plates 93-94: Dwellings that will be directly impacted by the proposed highway

Vanity Fair/Linstead

Situated in the path of the alignment are a number of structures at Vanity Fair/ Linstead. At reference points 746318.87E 666255.36N (4f) and 7446339.12E 666128.79N (4g) are located the fire station, hardware store, other commercial buildings and residences. The rail way line will also be affected. This line is currently used by the bauxite company and is part of the government of Jamaica's railway rehabilitation project.

Plate 95: Showing the fire station, hardware and Small Park that will be affected by the proposed highway

Plate 96: Showing a conference centre and other business places that small park that will be affected by the proposed highway

Plate 97: Dwelling that will be directly impacted by the proposed highway

Plate 98: Showing the railway line that will be affected by the proposed highway

An orange grove and coconut farm adjoining a Nursing Home lies in the direct path of the alignment at reference point 746675.77E 666485.70N (4g). Several houses and commercial buildings in this locale are also in the path of the proposed highway.

Plate 99: Showing a nursing home that will be affected by proposed highway

Plate 100: Showing a garage that would be affected by the proposed highway

Widening of the existing alignment is proposed for this stretch of the highway. The highway will continue along the bypass with widening of the existing road until it joins the other leg of the highway at Byndloss. However, commercial enterprises abut the roadway at reference point 746776.856E and 666587.399N.

Plate 101: Showing a commercial building that will be affected by the proposed highway

Table 8: Coordinates of significant heritage sites along proposed route

SITE	DISTRICT	X_CORD	Y_CORD	ZONE
Taíno Site 1	Caymanas Estate	760541.9700	65321.9500	1 (1b)
Taíno Site 2	Cross Pen	754790.9600	653509.4800	2 (2c)
Taíno Site 3	Cross Pen	753855.6400	653790.8100	2 (2d)
Obama Heights Housing Development	Cross Pen	754260.5200	653723.8000	2 (2e)
House with cut stone foundation	Cross Pen	753288. 8100	654302.3700	2 (2f)
Abandoned factory	Cross Pen	754521.1500	653799.5400	2 (2g)
Quarry	Cross Pen	755231.2900	653286.0400	2 (2h)
NWC Pumping Stations	Cross Pen	753831.8800	653790.9600	2 (2i)
Great House Ruin and compound	Cross Pen	753831.8800	653705.9600	2 (j)
Taíno Site 4	Content	752592.5100E	654826.8400	2 (2k)

Cemetery	Content	752621.8900	654825.9200	2 (2l)
Pumping Stations	Content	752396.6300	654851.4800	2 (2m)
Pipeline	Content	752669.3400	654784.4400	2 (2n)
Path	Content	752226.4100	654002.0600	2 (2o)
Taíno Site 5	Crescent	752004.8800	655371.6200	3 (3a)
Taíno Site 6	Crescent	751703.1000	655604.0300	3 (3b)
Taíno Site 7	Dignum Mountain	750152.0900	657875.9200	3 (3c)
Dwellings	Harker	748685.94000	659959.6000	3 (3d)
Taíno Site 8	Harker	748808.1600	659959.6000	3 (3e)
Foundation, assemblage of artefacts including Taíno	Puss Gully	748968.6800	659215.9600	3 (3f)
Taíno Site 9	Wakefield	747395.2600	661202.4100	4 (4a)
Assemblage of artefacts including - Taíno sherds	Wakefield	747165.8300	661219.2000	4 (4b)
Farm buildings	Cambrian	745675.9400	662471.1800	4 (4c)
Dwellings, Shops	Banbury	745691.1300	665225.1500	4 (4d)
Dwellings	Banbury	745898.6900	665551.6800	4 (4e)
Dwellings, commercial buildings, fire station, railway line, road	Vanity Fair	746318.8700	666255.3600	4 (4f)
Nursing Home, houses, commercial buildings, orchard	Vanity Fair	7446339.1200	666128.7900	4 (4g)
Commercial buildings	Byndloss	746776.8500	666587.3900	4 (4h)

7. IMPACT IDENTIFICATION/ MITIGATION RECOMMENDATION

Caymanas

Development Impact

The proposed alignment will impact directly on

- The irrigation system
- Taíno site (1b)
- Canefields
- Palm trees and marsh; possible Governors/Government Spring, this site has not been identified on the ground (1c)

The Dawkins farm and stable will be indirectly impacted.

Plate 102: Showing Stables that will be indirectly impacted

Mitigation Action

- Acquisition of land
- Due to the fact that Taíno and historic artefacts found in the area monitoring is to be conducted during clearing and excavation stage.
- Further evaluation to ascertain the magnitude of the Taíno site
- In constructing the proposed highway plans should be put in place to ensure the preservation of the historic water canal. A bridge should be built over the canal.

- Take measures to reduce dust and noise pollution.
- Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction

Mount Gotham

Development Impact

The proposed alignment will run through Mt. Gotham.

Mitigation Action

- Due to the fact that an historic site is indicated for the area monitoring is to be conducted during clearing and excavation stage.

Waterloo Valley

Development Impact

The proposed alignment will traverse Waterloo Valley.

Mitigation Action

- Due to the fact that a historic site is indicated in the area monitoring is to be conducted during clearing and excavation stage.
- Construct bridges or under passes to allow for access where community is separated by highway

Cross Pen

Development Impact

The proposed alignment will impact directly on approximately twenty- seven structures that lie in the direct path of the proposed alignment including, the historic Great House compound, the two Taíno sites and the quarry. The pumping stations and other houses will also be indirectly affected.


Plate 103


Plate 104

Plates 103-104: Dwellings that will be directly impacted by the proposed highway

Mitigation Action

- Due to the fact that Taíno and historic artefacts were found in the area monitoring is to be conducted during clearing and excavation stage.
- Further evaluation to ascertain the magnitude of the Taíno sites
- Acquisition of land
- Relocate affected persons.
- Take measures to reduce dust and noise pollution.
- Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction
- Construct bridges or under passes to allow for access where community is separated by highway

Alternative

Shift proposed alignment to the north thus avoiding community and agricultural fields.

Content

Development Impact

The proposed highway alignment goes straight through the community and as such will result in the destruction of the Taíno site, houses, commerical buildings, the historic pipeline and 2 cemeteries possible historical sites. It will definitely impact negatively on agriculture which is the primary means of livelihood for the community. The path leading to the Ford will be impacted by the proposed alignment. The pumping stations will also be directly affected.


Plate 105


Plate 106

Plates 105-106: Structures that will be directly impacted by the proposed highway

Mitigation Action

- Due to the fact that Taíno and historic artefacts were found in the area monitoring is to be conducted during clearing and excavation stage.
- Further evaluation to ascertain the magnitude of the Taíno sites
- Acquisition of land
    - Relocate affected persons.
    - Take measures to reduce dust and noise pollution.
    - Relocate cemeteries
    - Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction
    - Construct bridges or under passes to allow for access where community is separated by highway

Alternative

Shift proposed alignment to the north thus avoiding community and agricultural fields

Rio Cobre Dam

Development Impact

The highway will not directly impact the dam. However, care must be taken to minimize pollution of the water of the Rio Cobre.

Crescent

Development Impact

The highway alignment goes straight through the community and as such will result in the destruction of houses, pre historical and possible historical sites. It will definitely impact negatively on fruit bearing trees which play an important economic role for the people of the community.

Plate 107: Showing the location of Taíno Site 5

Plate 108: Dwellings that will be directly impacted by the proposed highway

Mitigation Action

- Due to the fact that Taíno and historic artefacts were found in the area further archaeological evaluation should be carried out before construction and carry out rescue operation during excavation
- Further evaluation to ascertain the magnitude of the Taíno sites
- Acquisition of land
    - Relocate affected persons.
    - Take measures to reduce dust and noise pollution.
    - Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction
    - Construct bridges or under passes to allow for access where community is separated by highway

Alternative

Shift centre alignment to the north thus avoiding community

Community response to proposed development

Interview with community members have shown an overwhelming support for the development providing they are treated fairly.

Dignum Mountain/ Mount Pleasant

Development Impact

The highway alignment goes straight through a section of the community and as such will result in the destruction of houses, pre historical and possible historical sites. It will cross the train line The proposed alignment will impact on the Taíno site found at reference point750152.0900E and 657875.9200N

Mitigation Action

- Due to the fact that Taíno and historic artefacts were found in the area monitoring is to be conducted during clearing and excavation stage.
- Further evaluation to ascertain the magnitude of the Taíno sites
- Acquisition of land
    - Relocate affected persons.
    - Take measures to reduce dust and noise pollution.
    - Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction
    - Construct bridges or under passes to allow for access where community is separated by highway

Harker

Development Impact

1. Destruction of houses and fields
2. Destruction of access road

3. Will also destroy a significant portion of the Harker Taíno site
4. Impact directly on the historical integrity of Harker.

Plate 109: Dwelling that will be directly impacted by the proposed highway

Plate 110: Taíno sherds collected at Harker

Mitigation Action

Acquisition of land and relocation of affected residents

Carry out further archaeological evaluation before construction and carry out rescue operation during excavation

- Take measures to reduce dust and noise pollution.
- Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction
- Construct bridges or under passes to allow for access where community is separated by highway

Alternative

Shift proposed alignment approximately 400 metres to the east of reference point 748685.94000E 659959.60000N.

Community response to proposed development

When asked about their views on the proposed alignment citizens were in favour of the development as they explained that this would open up the area to further development, job creation and better quality road and infrastructure. Some were apprehensive about their property and how this would be treated.

Puss Gully/ Gibraltar/Harker

Development Impact

1. Destruction of cultivated fields
2. Destruction of cut stone foundation and wall
3. Destruction of cultural area with assemblage of artefacts

Mitigation Action

Carry out further archaeological evaluation before construction and carry out rescue operation during excavation

Plate 111: Showing cut stone foundation

Plate 112: Showing artefacts *in situ*

Wakefield

Development Impact

1. Destruction of cultivated fields
2. Destruction of Taíno site

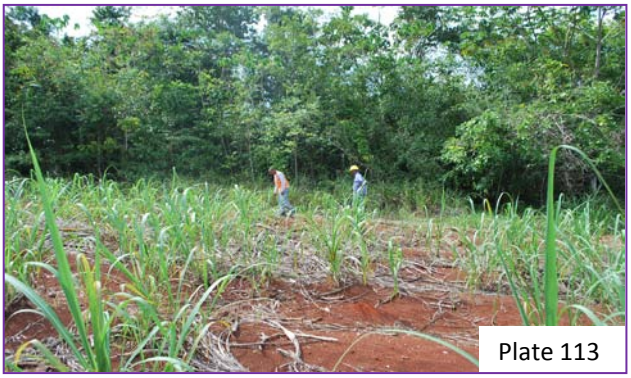


Plate 113

Plate 114

Plates 113-114: Showing location of Taíno site and Taíno artefact *in situ*

Plate 115: Showing where proposed highway alignment will follow current road

Mitigation Action

- Acquisition of land
- Conduct further archaeological evaluation before construction to ascertain the magnitude of the Taíno sites and find out of any historic remains are in the area
- Monitoring is to be conducted during clearing and excavation stage.
- Carry out rescue operation during excavation

Cambrian

Development Impact

1. Destruction of farm buildings
2. Destruction of fields and pastures

Mitigation Action

- Acquisition of land and the relocation of affected residents
    - Take measures to reduce dust and noise pollution.
    - Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction
    - Construct bridges or under passes to allow for access where community is separated by highway

Heathfield

Development Impact

No significant archaeological impact was detected. However because the area is documented to be part of a historical estate undetected features maybe present.

Mitigation Action

- Acquisition of land
- Monitoring of the area is to be conducted during clearing and excavation stages.
    - Take measures to reduce dust and noise pollution.
    - Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction
    - Construct bridges or under passes to allow for access where community is separated by highway

Banbury

Development Impact

The proposed highway alignment goes straight through the community and as such will result in the destruction of houses and commerical buildings.

Mitigation Action

- Acquisition of land
- Relocation of affected residents
- Steps to be taken to reduce air, noise and water pollution
- Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction
- Construct bridges or under passes to allow for access where community is separated by highway
- Construct bridges over Black River and access roads

Community response to proposed development

Interview with community members show that some were apprehensive about their property and how this would be treated.

Vanity Fair/Linstead

Development Impact

The proposed highway alignment goes straight through the community and as such will result in the destruction of houses, commerical buildings, the fire station, railway lines, roads and orchards.


Plate 116


Plate 117

Plates 116-117: Showing fire station and dwelling that will be impacted by proposed highway

Mitigation Action

- Acquisition of land and relocation of affected residents
- Rebuild fire station
- Construct bridges over the railway line and the Linstead to Vanity Fair and Rose Hall main road.
- Steps to be taken to reduce air, noise and water pollution
- Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction
- Construct bridges or under passes to allow for access where community is separated by highway

Byndloss

Development Impact

The proposed reconstruction on existing alignment will require the destruction of several extant structures that abut the existing alignment.

Plate 118: Showing commercial businesses that will be affected by proposed highway

Mitigation Action

- Acquisition of land and relocation of affected residents
- Steps to be taken to reduce air, noise and water pollution
- Drainage to be addressed so as to avoid flooding of areas as a result of increased surface run off due to road construction

Community response to proposed development

Interview with community members have shown that some were apprehensive about their property and how this would be treated.

Table 9: Summary of Potential Impacts due to Proposed Project

No.	Impact	Negative		Positive		No Impact
		Short Term	Long Term	Short Term	Long Term	
A	**Project Setting**					
I.	Displacement of People				√	
II.	Change of land use				√	
III.	Loss of trees/vegetation		√			
IV.	Shifting of utilities				√	
V.	Impact on archaeological property		√			
B	**Construction Phase (including pre-construction activities)**					
I.	Pressure on local infrastructure	√				
II.	Impact on water quality	√				
III.	Impact on air quality (including dust generation)	√				
IV.	Noise pollution	√				
V.	Traffic congestion	√				
VI.	Staking and disposal of construction material	√				
VII.	Public health and safety	√				
VIII.	Social impact	√		√		
C	**Operational Phase**					
I.	Change in ambient air quality		√			
II.	Increase in noise levels		√			
III.	Induced infrastructure development				√	
IV.	Quality of life				√	

8. Study Evaluations

The methods of survey techniques employed in this project was dictated by the nature of the topography, vegetation cover, accessibility and time allowed for the survey. It is believed that these techniques provided us with the best possible coverage and accuracy of the results. The techniques brought us in direct contact with the sites and the people who will be affected by the highway. The background information on the various communities was derived from primary documentary sources, oral traditions and supported by secondary narratives.

The methodology used in the assessment of the project area and the results derived fully met the stated objectives.

Based on the inaccessibility of some areas especially in the karst limestone central zone of the highway alignment the survey team was unable to ascertain the level of impact in these areas. However, satellite image survey and documentary evidence show the absence of cultural habitations in most areas.

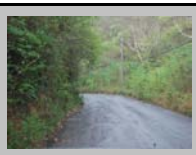
This impact assessment not only provides information in terms of new historical and archaeological sites but gives an insight into the cultural context which paves the way for future study especially in the newly discovered Taíno sites.
The survey was conducted by the JNHT and the composition of the assessment team was made up of archaeologist specialists from the Archaeology Division.

9. APPENDICES

APPENDIX 1

North–South Leg Highway 2000 Heritage Inventory

#	Name of site	Location	Grid Reference	Description	Cultural Provenance	Impact	Mitigation/ Recommendations	Source of Research	Photo
	Caymanas (Dawkins and Taylor)	St Catherine	760541.0400E 653211.9500N	Pre Historic Taíno Site 1 Historic Historic Historic Sugar Cane	Taíno Anglo-Jamaican Anglo-Jamaican Anglo Jamaican	Destruction of Taíno Site 1 Will indirectly affect the horse stable and historic buildings Canals and locks will be affected	Monitoring to be conducted during clearing and excavation stages. Further evaluation to ascertain magnitude of site. Preservation of the historic water canal. A bridge should be built over the canal Fields will be destroyed	List of Sugar Estates 1739 Jamaica Almanack 1811, 1832, 1840, 1845 Return of Properties 1882 List of Properties 1912 Handbook 1879, 1880, 1887, 1898, 1900, 1919, 1944 Higman 1988 Craskell and Simpson Map 1763 Robertson Map 1804 Harrison Map 1882 St. Catherine 1915 St. C 271 & 275 St. C 306 St.C 684 A & B St.C. 688	   
	Mount Gotham /Taylors Mountain	St Catherine	757864.94E 653876.68N	Historic Archival sources show structures in the area	Anglo Jamaican	The alignment will be passing in the vicinity of the high tension wire	Further evaluation during clearing	Jamaica Almanack 1810, 1832, 1845 List of Properties 1912, 1930 Robertson Map 1804 Harrison Map 1882 St Catherine 1915	

								St. C 271 & 275	
	Waterloo Valley	St Catherine	756827.1400E 653357.2700N	Historic Historic Pen Archival sources show Great House in area	Anglo Jamaican	The alignment will cross road to Sligoville then into Mt. Gotham	Evaluation during clearing and excavation. Build bridge over road	Jamaica Almanack 1832, 1840,1845 List of Properties 1912, 1930 St. C 179	
	Cross Pen	St Catherine	754790.965E 653509.481N 753855.64E 653790.81N 754260.52E 653723.80N 755231.29E 653286.04N 754521.15E 653799.54N	Pre historic Taíno site 2 Taíno Site 3 Housing Development Stone Quarry Abandoned factory Water	Taíno Jamaican Jamaican Jamaican	Destruction of Taíno site 2 and Taíno Site 3 Goes straight through the Obama Heights Housing Development Destruction of Quarry Cold storage	Monitoring to be conducted during clearing and excavation stages. Further evaluation to ascertain magnitude of sites. Carry out further archaeological evaluation Acquire land and relocate affected residents. Shift centre alignment to the north thus avoiding community and agricultural fields. Carry out evaluation before construction and carry out rescue operation during construction	Jamaica Almanack 1840 Return of Properties 1882 List of Properties 1912 Extract Harrison's Map 1882 St.C 274 Craskell and Simpson Map 1763 Robertson Map 1804 Harrison Map 1882 1:12,500 Sheet 95C	   

				pumping Station 'W 'operated by National Water Commission	Jamaican	NWC pump will be affected by the alignment	Carry out further archaeological evaluation		
			753288.81E 654302.37N	House on brick foundation	Jamaican Anglo Jamaican	The alignment of the road will affect this house			
			753831.88E 653705.96N	Great House Ruin and Compound	Anglo Jamaican				
	Content	St. Catherine	752592.51E 654826.84N	Pre Historic Taíno site 4	Taíno	Destruction of the Taíno site	Carry out further archaeological evaluation before construction and carry out rescue operation during construction	Jamaica Almanack 1840, 1845 St. C 170 St.C 274	
				Residential area	Jamaican	The alignment will be going through the community and dwellings will be destroyed	Acquire land and relocate affected residents. Shift centre alignment to the north thus avoiding community and agricultural fields.	Harrison Map 1882 1:12,500 Sheet 95C	
			752621.895E 654825.926N	Cemetery (Yard}	Jamaican	Destruction of two cemeteries	Relocation of cemeteries		
			752396.637E		Jamaican				

			654851.488N	NWC Pumping Station		Disruption of the water supply			
	Content	St Catherine	752669.340E 654784.443N 752226.41E 654002.06N	Historic pipe line Path	Anglo Jamaican	Disruption of water supply			 
	Crescent	St Catherine		Pre Historic Pre Historic Taíno Sites 5 & 6 Residential Area	Taíno Jamaican	Highway will pass through Prehistoric site Goes straight the community- destruction of houses	Monitoring to be conducted during clearing and excavation stages. Further evaluation to ascertain magnitude of site Acquire land and relocate affected residents. Shift centre alignment to the north thus avoiding community	Jamaica Almanack 1840 Craskell and Simpson Map 1763 Bowen Map 1747 Robertson Map 1804 Harrison Map 1882 1:12,500 Sheet 95C St.C 286 St.C 285 St.C 274 Plummer	  
	Dignum Mountain	St Catherine	750152.095E 657875.923N	Pre Historic Taíno site 7 Dwellings	Taíno Jamaican	Highway will pass through the site Will go through the	Monitoring to be conducted during clearing and excavation stages. Further evaluation to ascertain	Jamaica Almanack 1840 Return of Properties 1882 List of Properties	

				Railway line	Jamaican	community destroying the houses	magnitude of site Acquire land and relocate affected residents. Shift centre alignment to the north thus avoiding community Build bridge over line	1912, 1930 Harrison Map 1882	
	Harker	St Catherine	748685.94000 E 659959.60000 N 748808.16200 E 660188.13100 N	Dwellings Pre Historic Taíno site 8	Jamaican Taíno	House will be affected by the alignment Will destroy a significant portion of the Harker Taíno site	Acquire land and relocate affected residents Carry out further archaeological evaluation	Sheet 85B St.C 921 Jamaica Almanack 1844	 
	Puss Gully /Gibraltar	St Catherine	748968.6800E 659215.9600N 749031.6500E 659282.8600N	Pre Historic Anglo Jamaican Cut stone foundation	Taíno Anglo Jamaican	Will destroy foundation and wall also assemblage of artefacts- including Taíno sherds, destruction of cultivated fields	Carry out further archaeological evaluation Monitoring to be conducted during clearing and excavation stages	Jamaica Almanack 1811, 1840, 1844, 1882, 1930 Return of Properties 1882 List of Properties 1918-1919 Harrison Map 1882 St.C 934 Sheet 85B St C 984 St.C 921 St. C. 974	  

	Wakefield	St Catherine	747395.2600E 661202.4100N 747165.8300E 661219.2000N	Pre Historic Taíno Site 9 Taíno Site 10 European and African Jamaican artefacts	Taíno Taíno European African Jamaican	Will destroy significant sites	Carry out further archaeological evaluation Monitoring to be conducted during clearing and excavation stages.	List of Sugar Estates 1739 Jamaica Almanack 1811, 1832, 1840, 1845 Return of Properties 1944 List of Properties 1912, 1918 Handbook 1879, 1880, 1888 Craskell and Simpson Map 1763 Robertson Map 1804 Harrison Map 1882 1:12,500 Sheet 85B St. C 1182,1044, 899, 1137, 1123, 221	
	Cambrian	St Catherine	745675.9400E 662471.1800N	Property	Jamaican Historic	Impact on farm buidings	Acquire property or shift alignment	Harrison Map 1882 1:12,500 Sheet 85B Return of Properties 1882 List of Properties 1912, 1930 Handbook 1919	

	Banbury	St Catherine	745691.1300E 665225.1500N 745898.6900E 66551.6800N	Dwellings Commercial buildings Dwellings	Jamaican Historic	Impact on several dwellings, commercial buildings	Relocate affected persons	Jamaica Almanack 1811, 1840, 1845, Return of Properties 1882 List of Properties 1912, 1930 Harrison Map 1882 1:12,500 Sheet 85B St. C 1025,1075,1033, 1030, 1029, 1028 1027,1026,1025, 1023, 1019, 1016, 1014, 1010, 1004, 1000A & B, 997, 992, 991, 990 a, b, c, 989 a, b, c, d, 988, 986, 985, 947	
	Vanity Fair	St Catherine	746318.87E 666255.36N 746675.77E 66485.70N	Dwellings commercial buildings, fire station, railway line, road Nursing Home, dwellings, commercial buildings, orchard	Jamaican Jamaican	Impact on several dwellings, commercial buildings, fire station, railway line, road	Relocate affected persons, rebuild fire station	(Linstead/ Rodney Hall) Jamaica Almanack 1811, 1840,1845 Harrison Map 1882 1:12,500	  

	Byndloss	St Catherine	746776.856E 666587.399N	Commercial buildings	Jamaican Historic	Will destroy buildings	Relocate affected persons	Jamaica Almanack 1811, 1832, 1840, 1845 Return of Properties 1882 Craskell and Simpson Map 1763 Robertson Map 1804 Harrison Map 1882	

APPENDIX 2

Artefacts Report for South North Corridor Highway 2000

Artefacts are important analytical tools used by the archaeologists in a variety of ways. When found in context they can tell of the occupants' lifestyle. For example, animal bones can reveal consumption pattern, and butchering practices; ceramics, glass and smoking pipes are used as dating tools as well as providing other information. Shells can indicate type of food sourced by the occupants of a site. Ceramics and glass tell of storage and consumption patterns and can also indicate trading patterns. Smoking pipes are indicative of recreational activities. It should be noted that some cultural items made of perishable material for example; calabashes, baskets and clothing do not survive in humid conditions hence their absence from the archaeological record. It should also be noted that artefacts are mostly recovered as sherds.

A three and a half day field walk was conducted on the South-North corridor of Highway 2000. During the field walk artefacts were collected from the surface of the following sites: Caymanas Estate, Cross Pen, Content, Crescent, Dignum Mountain, Harker, and Wakefield.

The time period of the artefacts ranges from 650 AD to the 20thCentury. A large number of the artefacts were Taíno earthenware, it can be concluded that these are Taíno sites which were later occupied by the Spanish, English, Enslaved Africans and Jamaicans.

Caymanas Estate: 99 pieces of artefacts were retrieved from this site

Plate119: Showing a horse shoe. 1655-1840 AD

Plate 120: Showing white clay smoking pipe bowls and stems -17th and 18th Century AD

Cross Pen: 10 pieces of artefacts were retrieved in this area

Plate 121: Bowl -Taíno Earthenware sherds 650 -1500 AD

Plate 122: Hand painted pearlware bowl sherd 1780-1820 AD

Content: 47 pieces of artefacts were retrieved

Plate 123: Showing African Jamaican earthenware bowl sherds 1655-1840 AD

Crescent- 15 pieces

Plate 124: Showing Taíno bowl sherds 650-1500 AD

Plate 125: Showing porcelain cup rim sherd 1660-1880 AD

Dignum Mountain: 14 pieces

Plate 126: Showing African Jamaican Earthenware bowl sherd 1655- 1840 AD

HARKER 53 pieces of artefacts were retrieved N.B- these were collected during Phase 1 of project (same alignment)

TAÍNO ARTIFACTS

Plate 127: Thirty five pieces of Taíno earthenware sherds have been identified as bowls - 3 rims and 32 body sherds; the minimum number vessels are 5. Date range 650- 1500AD

EUROPEAN ARTIFACTS

Plate 128: Bowl sherd, Cream ware - Date range 1720-1840 AD

Plate 129: Jar, Salt glazed stoneware sherd, Date range 1690-1775 AD

Plate 130: Bowl, earthenware with glazed inside Date range 1750-1800 AD

Puss Gully- Harker- 14 pieces were retrieved in this area

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Plate 131: Showing Earthenware bowl sherd with brown slip- Date range 18th Century

Plate 132: Showing Pearlware feather edged plate sherd

Wakefield: 37 pieces were retrieved in this area

Plate 133: Showing red clay smoking pipe stem -Date range 1660-1738

Table 10: List of Artefacts found

Site	Artefact Type /ware	Date	Total pieces
Caymanas Estate	Cooking pot sherd – iron	1655-1840	1 piece
Caymanas Estate	Horse shoe- Iron	1655-1840	1 piece
Caymanas Estate	Roof Tiles	1655-1830	11 pieces
Caymanas Estate	Pot sherds Taíno Earthenware	650-1500	34 pieces
Caymanas Estate	Bowl sherds African – Jamaican Earthenware	1655-1840	5 pieces
Caymanas Estate	Brick – Earthenware	1655-1840	1 piece
Caymanas Estate	White clay smoking pipe stem and body	17th -18th Century	9 pieces
Caymanas Estate	Bowl sherds cream ware	1762-1840	20 pieces
Caymanas Estate	Bowl sherds - combed slipware	1670-1795	2 pieces
Caymanas Estate	Plate rim -sherd cream ware	1762-1820	1 piece
Caymanas Estate	Soda water bottle – pale green glass	17th -19th century	1 piece
Caymanas Estate	Cylindrical Wine bottle body sherds	1740-1820	9 pieces
Caymanas Estate	Bowl sherds pearlware	1780-1840	4 pieces
Caymanas Estate	Bowl sherd- slipware	1670-1795	1 piece
Cross Pen	Cylindrical wine Bottle sherds	1740-1830	1 piece
Cross Pen	Bowl sherds – hand painted pearlware	1780-1820	1 piece
Cross Pen	Bowl sherds – Taíno earthenware	650-1500	8 pieces
Content	Cylindrical wine bottle base sherds	1740-1830	12 pieces
Content	Bowl sherds- African Jamaican Earthenware	1655-1840	24 pieces
Content	Concrete	20th Century	4 pieces
Content	Bowl sherds Taíno earthenware	600-1500	6 pieces
Content	Bowl sherd- porcelain	1745-1775	1 piece
Crescent	Bowl rim hand painted pearlware	1790-1890	1piece
Crescent	Plate base sherd – Transferprint pearlware	1795-1840	1piece
Crescent	Bowl body sherd –hand painted pearlware	1795-1840	1 piece
Crescent	Bowl sherd African-Jamaican earthenware	1655-1840	1 piece
Crescent	Plate rim sherd pearlware sponge decoration	1780-1840	1 piece
Crescent	Cup rim sherd –porcelain	1660-1880	1 piece
Crescent	Bowl sherds African	1655-1840	7 pieces

	Jamaican earthenware		
Crescent	Bowl –body sherd – pearlware	1780-1840	1 piece
Crescent	Plate base sherd -cream ware	1762-1820	1 piece
Dignum Mountain	Bowl sherds – African Jamaican Earthenware	1655-1840	7 pieces
Dignum Mountain	Bowl sherds – Taíno Earthenware	650-1500	4 pieces
Dignum Mountain	Cylindrical wine Bottle sherd	1740-1830	2 pieces
Dignum Mountain	Shell	-	1 piece
Pus Gully/ Harker	Plate sherd – featheredge pearlware	1775-1830	2 pieces
Pus Gully/ Harker	Mug rim sherd – Cream ware	1762-1820	1 piece
Pus Gully/ Harker	Plate base sherd – Cream ware	1762-1820	1 piece
Pus Gully/ Harker	Bowl – sherd – Earthenware with brown slip	18th Century	1 piece
Pus Gully/ Harker	Bowl rim sherd – African Jamaica earthenware	1655-1840	1 piece
Pus Gully/ Harker	Bowl rim sherd – Earthenware with Annular Decoration	18th century	2 pieces
Pus Gully/ Harker	Bowl sherds Taíno earthenware	650-1500	4 pieces
Pus Gully/ Harker	Bowl sherds African Jamaica	1655-1840	2 pieces
Wakefield	Bowl sherds – Taíno Earthenware	650 1500	29 pieces
Wakefield	White clay Smoking Pipe Stem	17th -18th Century	1 piece
Wakefield	Bowl sherd – African Jamaican Earthenware	1655-1840	2 pieces
Wakefield	Bowl sherds- cream ware	1720-1840	2 pieces
Wakefield	Red clay smoking pipe stems	1660-1738	2 pieces
Wakefield	Bowl sherd – African Jamaican Earthenware	1655-1840	1 piece

APPENDIX 3

PLACE-NAMES

Place-names reflect the nature and history of a country and its inhabitants and cannot be ignored when reconstructing the historic landscape. Place-names may contribute to the reconstruction of patterns of settlement by groups of people such as the Spanish (Angels –*Los Angelos*, *Crescente*-Crescent*),* Giblatore and Gibraltar. They can refer to topographic features, soil type and vegetation, for examples, mountain Dignum Mountain, Mount Gotham, spring Governors Spring and gully-Puss Gully. Place-names can indicate present or past activities as reflected in the following –Cross Pen and Crescent Pen- cattle rearing.

Some names reflect a state of mind such as Mount Pleasant and Content.

Place-names are subject to change and this can occur for various reasons such as new settlers inhabiting a region or new activities occurring at the locations. Just as place-names are subject to change so also the status of the places bearing the names may themselves also alter as at no time has man's exploitation of his environment remained totally static. Woods have been felled and so have contracted in size or disappeared altogether; marshland has been drained settlements have expanded, contracted or been abandoned completely; and specialized sites have changed their purpose. Many of the names in the study region are transfer names and may be reflective of nostalgic yearning of earlier owners of previous homelands for example Banbury, Cambrian and Heathfield. Many names denote ownership, for example, Dawkins, Ellis and Taylor Caymanas, Byndloss and Harker. Names can become corrupted over time such as Crescente to Crescent.

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Arc View GIS 3.2

Ikonos Imagery

Table 11: Estates Maps and Plans - St. Catherine

Name of Site	Plan #	Information
Caymanas	684 A & B	A plan showing the estates of Ellis' Caymanas owned by Howard Dewalden , Taylors Caymanas owned by James Ewing, Dawkins Caymanas owned by Henry Dawkins, Marches Bog, and Farm Pen owned by Lord Carrington. Surveyed by Thomas Harrison.
	306	Plan showing boundary between Caymanas and the Farm, 1800.
	St. C 271 & 275 St. C 306 St.C 684 A & B St.C. 688	
Mount Gotham	St. C 271 & 275	
Waterloo	179	Plan of small lots of waterloo in the parish of St. Catherine, by J. H. Dodd. 1877.
Cross Pen	St.C 274	
Content	St. C 170 St.C 274	
Crescent	St. C 285 St.C 286 St.C 285 St.C 274	Plan of Crescent Pen containing four hundred and forty acres, by Thomas Harrison, 1872.
Gibraltar Pen and Douglas Castle/ Puss Gully	St.C. 974 St.C 984 St.C. 921	Choppin, John Gibraltar Pen and Douglas Castle The diagram shows the lines of Gibraltar Pen and Douglas Castle in the parish of St. John. The area circumscribed in red represents 65 acres of land in dispute. They also show the transfer of parcels of land between different owners such as; Phillip Redwood to John Choppin, Alger Pestell to Edith Loth... Surveyed 1861.
Wakefield	1182 1044 899	The red lines represent Wakefield and part of Palmer Hut Old Sugar Estate in St. Catherine containing 1982 acres. The parcel marked A is the unnamed portion of Wakefield Estate with 692 acres. B shaded red, part of Palmer Hut Estate to be attached to Wakefield contains 290 acres and is intended to be conveyed by Jose Castulo Balbona et al to L. Casanova and M. Estrada for whom this survey is being made. Surveyed by Sinclair and Mossman April 6, 1874.

	1137 1123 221	Diagram represents several parcels of land and estates in the parish of St. Thomas- in- the- Vale including Wakefield Pen, Palmer Hut, Charlton, Jericho Plantation, Stirling Castle Estate, Mayfield Pen, Treadways Estate, Razamount Plantation, and Mickleton Plantation... Surveyed 1860(?). Diagram represents sundry traverses made in order to ascertain the bounds and Quantities of Wakefield Estate in the parish of St. Thomas and St. Catherine which are shaded green. The parcels A and B containing together 29 acres would become part of Wakefield if Smith and Keislar plots were fixed. Surveyed 1788. A plan showing lands belonging to William Mathews and Wakefield Estate. A plan of part of Wakefield owned by Francis Parker bounded on the east by lands owned by Peter Peck, Daniel Broadbelt and W. Cuntis. Plan of Wakefield Pen.
Banbury	1000 A, B 997 992	Diagram shaded red represents 20 acres of land in the parish of St. Thomas in- the- vale, part of Banbury Plantation intended to be conveyed by Messrs Edbury and Roach to Henry Cooper. It is butted and bounded westerly and northerly on the Rio Cobre, southerly on land sold to Mary McCatty and John West, easterly on Edward Jackson. Surveyed 1838.
	991 990 a, b, c	Diagram represents 10 acres of land, part of Banbury Plantation in the parish St. Thomas in- the- Vale intended to be conveyed by Thomas Edbury Esq. to John Hay Little. Surveyed 1837.
	989 a, b, c, d	Diagram represents 3 acres of land part of Banbury Plantation in the parish of St. Thomas-in-the-Vale to be conveyed by Mr. Edbury & Roach to George Taylor. Surveyed 1839.
	988 986	The diagram represents 4 acres of land part of Banbury Plantation in the parish of St. Thomas-in-the-Vale about to be conveyed by Mr. Edbury & Roach to William Francis and Thomas McDermott. Butted and bounded on one side by the Rio Cobre, North and North -easterly by same land, Westerly on John McInnis, and Southerly on George Taylor. Surveyed 1839.

	Diagrams represents several parcels of land parts of Banbury Plantation in the parish of St. Thomas-in-the-vale belonging to Mr. Edbury and Roach to be conveyed to new owners including Thomas Henry , Ino Welsh, James Richards. Surveyed 1839 - 40.
	The diagrams represent several parcels of land belonging to Banbury Plantation in the parish of St. Thomas-in-the-Vale. Intended to be conveyed by Mr. Edbury & Roach to different persons including Mr. Loraine & John Macinnis….. Surveyed 1839-1840.
	The diagram represents four acres of land part Banbury Plantation in the parish of St. Thomas-in-the-Vale intended to be conveyed by Miss Edbury and Roach to Robert. Surveyed 1838.
	The Diagram represents 5 acres of land, circumscribed in red; part of Banbury Plantation intended to be conveyed by Mrs. Edbury & Roach to Ms. Mary McCartty. It is butted and bounded to the North and Northwest by H. Cooper, Westerly and Southerly by John West and North-easterly and Southeasterly by the same land and a section of the Rio Cobre. Surveyed 1838.
985 947	Diagram represents one acre of land part of Banbury. Thomas Edbury Esquire to be conveyed to Duncan McBean. In the parish of St. Thomas-in-the-Vale. Surveyed 1840.
	The diagram represents the track of a new road by a bridge across the Black to intersect the road leading to Banbury and being 10 1/2 chains in the parish of St. Thomas- in- the- Vale. Surveyed 1859.