

NEPA COMMENTS

1. Structure Survey along with a letter stating that this is proprietary information and should therefore not be made public.

Response

A letter was sent to NEPA on December 11th, 2012 (Attachment 1) stating information regarding the project was not to be made public.

2. Copy of the map acquired from the Urban Development Corporation (UDC) illustrating the highway and its proposed route through the Caymanas lands.

Response

A copy of the map was sent to NEPA on December 17th, 2012 (Ref: 2012/rb/2A/12/05)

3. An assessment of the sinkholes and wells to be affected by the proposed alignment of the highway. This assessment shall include but not be limited to a flora and fauna assessment of the sinkholes.

Response

This activity will be carried out as part of additional detailed studies of the project.

4. A copy of the guideline document with respect to sinkhole "treatment" during construction.

Response

See Attachments' 3-4; General guideline for Treatment of Sinkholes and Treatment of Sinkholes

5. The results of the bat survey that was conducted and additional assessments to identify the presence of any 'rare, endangered, endemic or threatened' species of bats.

Response

Presence / absence surveys were carried out for the presence of bats at the sample sites. The residence in the area which includes farmers and coal burners were interviewed about bat presence in caves, rock faces and trees in the area. A detail bat survey will be carried out with bat consultant within the caves and sinkholes in the area. In addition the survey will be carried out in the forest. The proposed methodology will be sent to NEPA for comments. The complete Fauna report can be found in Attachment 5

6. Information regarding the forest reserve that the proposed alignment of the highway currently affects.

Response

The Hampton Forest Management Area (FMA) was established by the Hampton Forest Management Declaration Order of 2005. The establishment of the FMA was in accordance with Section 5 of the Forest Act, 1996 and is consistent with the other applicable provisions found in the Forest Act, Forest Regulations, Forest Policy and the Strategic Forest Management Plan.

The FMA was primarily established to allow for the continued conservation of the water, wildlife and forest resources on the designated properties, through the facilitation of a public-private partnership between the landowner and the Department in relation to the maintenance of these values. To fulfil the statutory requirements under Sections 46 and 47 of the Forest Regulations, 2001 which stipulates that any private lands so declared, “shall be managed in accordance with a management plan”, the following Plan to manage the FMA has been developed.

The above mentioned is outlined in detail in the 2012 Draft ‘Local Forest Management Plan For Tulloch Estate and Hampton Forest Management Areas’ prepared by the Forestry Department (Attachment 6).

Hampton Estate FMA is a privately owned piece of land will be impacted by the proposed alignment. The alignment is expected to pass through a section along the northern boundary, which is already experiencing anthropogenic impacts; example agricultural farming (sugar cane), logging, and animal husbandry.

NEPA recommended for the Forest Estate area to be investigated and the possible impacts explored. Surveys will be conducted in the area now that the boundaries of the forest area have been acquired from the Forestry Department.

7. Outline Drainage Plan assessing the general drainage patterns and areas to be affected by the proposed alignment with the corresponding mitigation measures that would inform the detailed drainage design.

Response

The General Drainage Guidelines (Attachment 7) includes general design and mitigation guidelines as well as the approval process.

The proposed design will follow three (3) review/approval phases:

- 1. Outline design,*
- 2. For Approval Design, and*
- 3. Final Design*

Drawings and reports will be submitted to NROCC and NWA for approval before construction.

8. Details with respect to the outline design to detailed design process and expected deliverables.

Response

Expected Deliverables:

The following deliverables are expected, but are not limited to:

1. *Roadway and pavement design;*
2. *Drainage design;*
3. *Structures design (bridges, retaining walls, culverts, etc.)*
4. *Signing and pavement marking design*
5. *Maintenance of Traffic during construction;*
6. *Highway facilities design (toll gates, etc.);*
7. *Construction Method Statements and Specifications;*
8. *As-built*

Review/Approval process:

The proposed design will follow three (3) review/approval phases:

1. *Outline design,*
2. *For Approval Design, and*
3. *Final Design.*

Drawings and reports will be submitted to NROCC and NWA for approval before construction.

Preliminary Project Schedule:

The Project Schedule (Sections 1, 2 and 3) can be found in Attachment 8

9. Information with respect to the forest reserve.

Response

Details of the impact area and additional agreements with the owners of the Hampton FMA will be provided once all legal agreements and discussions with the land owners have been finalized (Attachment 9).

10. Further analysis by the Agency has also highlighted the fact that the current starting point of section one of the proposed highway at Caymanas would result in the loss of the large "Guango trees" on both sides of the existing highway. The Agency views this as unacceptable and hence you are being requested to adjust the alignment to avoid these stands mature trees which are to be retained undisturbed in perpetuity. Additionally, the consultants are hereby requested to do additional work in the areas of the alignment that traverses forests with a view to proposing mitigation measures to prevent the fragmentation of these habitats.

Response

Once the final alignment has been established a detailed outline of areas identified of high priority will be made. These areas will be assessed in detail by CL Environmental with any additional criteria/suggestions by the Agency.

NWA COMMENTS

1. Justification and mitigation for the removal of a number of sinkholes have been provided.

Reason: Filling a sinkhole results in a change of the drainage pattern of the area and will require some remedial action to address the loss of a storm water disposal site.

Response

The General Guidelines for Treatment of Sinkholes can be found in Attachments 3-4.

2. Design for the proposed drain and drainage system.

Response

The General Drainage Guidelines (Attachment 5) are given along with the proposed design will follow three (3) review/approval phases:

1. *Outline design,*
2. *For Approval Design, and*
3. *Final Design*

Drawings and reports will be submitted to NROCC and NWA for approval before construction.

3. The impact of the surface drainage/storm water runoff system on the Fresh River and Bridge that traverses the Mandela Highway within this section of the proposed Highway and the Caymanas Development Zone.

Response

Section 6.2.4 (page 307 - Runoff Impact) outline the potential impacts as it relates from runoff from the proposed highway. Table 6.4 – Runoff from proposed highway details the expected increase in runoff as a result of the proposed highway. It is expected that there will be an increase runoff of 1.33% compared with the existing condition.

A fresh water survey will be carried out in the Fresh River to get baseline information on the fresh water fauna if required

The Research Report on Flood Disaster Control Program of Caymanas Economic and Technological Development Zone, by CCCC, August 2012 and the Stormwater Management Guidelines can be seen in Attachments 10 and 11 respectively.

4. No mention is made of an instrument to monitor implementation of the sediment management system.

Response

Information regarding any monitoring activities, during construction activities will be outlined in the Environmental/Construction Monitoring Plan to be presented to the Agency once the Environmental Permit has been granted.

Monthly monitoring reports will be submitted to the Agency which will outline the level of compliance during construction, as outlined in the EIA (Section 10.2 page 337). Additional surrogate measurement of water quality (total suspended solids and turbidity) will also give an indication of the efficiency of the installed sediment management system.

5. No mention is made of the channel downstream the existing H2K ramp at Caymanas or measures to protect areas such as the Spanish Town By-pass Bridge, Existing H2K and main road bridges at Caymanas.

Response

The research Report on Flood Disaster Control Program of Caymanas Economic and Technological Development Zone, by CCCC, August 2012 (Attachment 10) gives the general approach to any issues concerning changes in flooding in the area.

6. No mention is made of the traffic impacts of the project, the safety features of its operation and road construction.

Response

a) A Traffic Assessment Report analysing existing and post-develop conditions will be done by the Developer/Contractor as part of the project design and before construction. This information will be submitted to NROCC, NWA and any other Agency that may require this information.

b) During the implementation of the project design Method Statements (MS) will be developed and submitted to NROCC and NWA for review and approval. These MS will cover safety features, operations during construction and operations after construction (maintenance, etc.).

7. There is no mention of the management and possible adverse impact of the use of prime and tack coat application on the proposed highway.

Reason: Improper management of the use of these petroleum oil based products pose one of the major environmental threats for the project.

Response

The Developer/Contractor is obligated by the Concession Agreement to develop Method Statements and Specifications that will be submitted for review and approval to NROCC and NWA before construction begins. Part of this information will include the management, application, storage, and disposal of these materials in addition to containment of accidental spill and procedures. These Method Statements and Specifications shall be approved and in place before construction begins.

JET COMMENTS

1. Proper justification for the highway has not been established. Typically, large infrastructure projects such as this one require strong justification. According to the Federal Highway Administration (FHWA), “The purpose and need of a project is essential in establishing a basis for the development of the range of reasonable alternatives required in an EIS and assists with the identification and eventual selection of a preferred alternative” (FHWA 2012a). The purpose and need section should “provide justification of why the improvement must be implemented, be as comprehensive and specific as possible and should be re-examined and updated as appropriate throughout the project development process” (FHWA 2012a).

Response

The Highway 2000 North South Link from Caymanas to Ocho Rios is the product of several Jamaican government initiatives and studies that started in last 20 years to upgrade the country’s infrastructure and revitalize the Jamaican economy. Historically, it is well documented that in developing countries investment in transportation infrastructure generates economic benefits by reducing transportation costs for existing activities, providing access to new areas with economic development potential and creating investment activities. This proposed highway will meet international standards and requirements of projects of this nature and will alleviate the current traffic problems in the poorly built and insufficient roads infrastructure from Caymanas to Ocho Rios.

The following give an example of the generalized benefits/justification of the project which are given in Vision 2030

1. *Reduce traffic*
 2. *Reduce travel time*
 3. *Reduce accident potential for both vehicular and pedestrian traffic*
 4. *Stimulate economic growth*
 5. *Create jobs*
 6. *Alternative route to the North Coast*
 7. *Avoiding flood prone areas such as the Bogwalk Gorge*
2. The EIA for the proposed Highway 2000 alignment falls short in its ability to prove there is a sufficient need based on a lack of data provided in the report. When analysing the purpose and need section of the Highway 2000 EIA, several

inadequacies arise concerning the thoroughness of the data provided in the sections discussing current roadway and traffic deficiencies, current roadway capacities, and economic development along the proposed alignment.

Response

The construction of Highway 2000 will provide significant benefits to the Jamaican travelling public. The benefits have include travel time savings (possible increase productivity and lower transportation costs), vehicle operating cost savings, public safety savings (reduced accident costs), rehabilitation and maintenance cost savings on the existing highway network and savings related to other externalities (primarily air pollution related).

It is estimated that 36% of the total construction cost will be spent on Jamaican goods and services and 64% on foreign goods and services. Travel time savings and vehicle operation costs savings represent nearly 90% of total projected benefits (HIGHWAY 2000 PROJECT Preliminary Design Phase ECONOMIC COST-BENEFIT ANALYSIS, July 2000).

The North South Link of Highway 2000 forms a pillar of Jamaica's Vision 2030 Plan and more specifically the Transport Sector Plan.

*"This Sector Plan for Transport is one of the strategic priority areas of the **Vision 2030 Jamaica - National Development Plan**. It is one of thirty-one sector plans that form the foundation for Vision 2030 Jamaica – a 21-year plan based on a fundamental vision to make 'Jamaica the place of choice to live, work, raise families, and do business,' and on guiding principles which put the Jamaican people at the center of the nation's transformation.*

The plan was developed using the following processes:

- *Participation of Task Force Members¹ through Task Force Meetings² that were used to solicit ideas and views on transport issues and challenges facing Jamaica, as well as identifying a vision for transport in Jamaica, and determining key goals, objectives and strategies for the sector*
- *Sub-committees on land, air and maritime transport involving sector stakeholders*
- *Research on international best practices in transport that could be adopted in the Jamaican context*
- *Working group meetings between task force members and the PIOJ*
- *Development of a detailed Action Plan with responsible agencies and time-frames for implementation*

Extensive and high-quality infrastructure is considered a pillar of international competitiveness that;

- i. *Enables the efficient functioning of markets for goods, services and labor;*
- ii. *Increases the productivity of economic processes; and improves decision-making by entrepreneurs and other economic actors.*

The Transport Sector Plan for Vision 2030 Jamaica will ensure the development of world-class transport infrastructure and services that contribute to the competitiveness of our producers and improved quality of life for our people.

Transport and National Development

The transport sector – land, air and maritime - represents a critical component of any country in its impact on national development. One of the most fundamental attributes of the sector is the ability to move persons, goods and services between spatial locations at the local, regional and international levels. The efficient management of the sector can provide tremendous economic and social gains to a country through indirect and direct employment as well as induced development which ultimately leads to wealth creation and growth.

Studies have revealed that for every US\$1.0 billion investment in highways through the Federal-Aid Programme in the United States of America, approximately 41,000 full time jobs are created.

An efficient and effective transport sector is indispensable to economic progress. Other sectors such as mining, manufacturing, trade, tourism and agriculture, which are critical to a nation's growth and development, depend upon transportation. Without adequate infrastructure to facilitate the movement of people and goods, economic and social benefits will be limited.

During the period 2004-2008, Transport, Storage and Communication (TS&C) contributed on average 11.5% to Jamaica's Gross Domestic Product (GDP). In 2008, Transport (road, railway, water and air including services allied to transport) and Storage contributed 5.6% to total GDP. The overall transport sector (including land, sea and air transport) is the largest consumer of petroleum in the Jamaican economy, accounting for 37% of the total quantity of petroleum consumption in 2008.

Investment in infrastructure has been shown to have a significant effect on economic growth. The results of the Threshold 21 Jamaica (T21 Jamaica) model indicate that improvement in the physical economic infrastructure (such as roads, air and sea ports, and telecommunications networks) usually has higher payoffs in the form of higher rates of economic growth than equivalent investment in health and education over the time horizon to 2030. This is because such improvements have a faster impact on total factor productivity.

The returns to investment in physical infrastructure tend to be high in countries at Jamaica's income level, especially considering the relative underinvestment in physical infrastructure in recent decades. These higher growth rates eventually increase the size of the economy and the levels of funding available for other services such as health and education over the medium and long term. High-quality infrastructure contributes to social and environmental goals, by improving access to public services, reducing negative environmental impacts and supporting the sustainable use of natural resources.

Issues and Challenges

With a dense road network and limited alternatives for internal transport, Jamaica is highly dependent on road transport for personal and freight movement. The challenges of road transport, therefore, will be fundamental to the long-term economic development of the island, including the following considerations:

1. Funding:

Funding for road construction and maintenance will present a major challenge to the public sector, particularly given the budget constraints imposed by the requirements for debt service payments. Expenditure on road work programmes amounted to \$4.2 billion in 2008, compared with \$5.2 billion in 2007. It will be important therefore to explore further opportunities for private sector participation and cost recovery through user fees in the construction of new roads, based on the example provided by the first phase of Highway 2000.

2. Traffic Management

Traffic congestion may result from a number of causes including volumes of traffic too high for road capacity, road obstructions and inefficient traffic management systems, and is characterized by slower speeds, longer trip times, and increased queuing.

The negative effects of traffic congestion include the loss of productive time of motorists and passengers, increased air pollution and vehicular wear and tear, and interference with passage of emergency vehicles. Jamaica currently experiences significant traffic congestion particularly in a number of urban areas throughout the country. Over the medium and long term it will be necessary for Jamaica to consider a wide range of measures to improve traffic flows in its road transport system, including;

- i. Use of more efficient traffic management techniques; junction improvements; promotion of higher vehicle occupancy; parking restrictions; intelligent transportation systems; and flexible work and school hours to reduce peak traffic flows.*

3. Road Safety and Access

Road safety represents an important aspect of a sustainable land transport system. While the number of road fatalities has declined over the past decade, the number of admissions to accident and emergency units of public hospitals resulting from motor vehicle accidents increased from 11,940 in 2001 to 12,678 in 2005, and jumped to 13,142 for 2008.

The Road Safety Unit of the Ministry of Transport and Works (MTW) is involved in Public Information Campaigns and an Education in Schools Programme to promote safe use of roads island-wide. Longterm reduction in accident and casualty rates will require effective implementation of the key approaches of the National Road Safety Policy, including; engineering and traffic management; education and information; enforcement and legislation; emergency response; and evaluation.

Access to land transport is also an issue as the existing public transport system presents access problems for a number of social groups, including the elderly and the disabled.

4. Sustainable Transport

The overarching concept of sustainable transport involves moving people, goods and information in ways that reduce the impact on the environment, the economy, and society,

Transport Sector Vision

The long-term development of the Transport Sector in Jamaica is guided by the following Vision taken from the draft National Transport Policy (2007):

“Sustainable, competitive, safe, accessible and environmentally friendly transport network providing world-class Air, Land, Rail, and Marine facilities contributing to a vibrant import, export and transshipment trade for Jamaica and the world”

Sub-Sector Visions

The Transport Sector Plan also contains Visions for Land, Air and Maritime Transport in Jamaica. The Vision for Land is presented below.

Land Transport

“A safe, efficient and sustainable system of land transport that facilitates economic and social development through the movement of people, goods and services throughout Jamaica” (derived from the draft National Transport Policy 2007).

Strategic Vision

The strategic vision for the transport sector in Jamaica has two (2) main components:

- i. Improvement of the domestic transport system for movement of persons, goods and services within and around Jamaica; and*
- ii. Development of Jamaica as a regional, hemispheric and global transport and logistics hub or junction.*

The two components of the strategic vision are linked, as the effective operation of a major transport and logistics hub requires the support of smoothly functioning internal transport systems, while the capacities of a major transport and logistics hub greatly expand the transport opportunities available to domestic, economic and social sectors.

The strategic framework presented below contains the main goals, objectives and strategies required to achieve both components of the strategic vision for the transport sector in Jamaica over the planning horizon to 2030.

Strategic Planning Framework Strategic Approach

Strategic planning for Jamaica's Transport sector is based on the premise that transport infrastructure and services will be central to the growth and development of the Jamaican economy and society throughout the timeframe covered by Vision 2030 Jamaica. The Plan seeks to expand and modernize the transport sector to support the development of value-added production in a range of economic sectors and industries where competitive advantages already exist or may be built in the future, and to enhance access to domestic, regional and international markets.

Domestic Transport System

The first responsibility of the nation's transport system is to meet the needs of the economy and society for the movement of persons, goods and services within and around Jamaica. The land, air and maritime transport system can make a significant contribution to economic development by facilitating efficient transportation of goods and services, by reducing transport costs in production and distribution, and by expanding the geographic range of distribution routes and markets. The transport system also can greatly increase social well-being by improving access to social and recreational services, facilitating community development and contributing to the exercise of individual rights such as freedom of movement and association.

The strategic vision seeks to achieve dramatic improvement of the domestic transport system and increase its contribution to economic and social development. This is to be done by building on the existing strengths of the land, air and maritime transport systems, and by addressing the main constraints to long-term expansion, upgrading and maintenance. The strategic vision also includes enhancement of the environmental sustainability of the domestic transport system. The development of a modernized public transport system will be a priority.

Goals and Outcomes

The seven (7) main goals and associated outcomes of the Transport Sector Plan are presented below. These goals represent the ultimate desired state of the Transport Sector through which we realize the Sector Vision. The Sector Outcomes represent the desired results which we seek to achieve under each goal. A range of indicators and targets aligned to the Sector Outcomes provide quantitative milestones against which progress in implementing the Transport Sector Plan over time may be measured (Table 1).

Table 1 Transport Sector Goals and Outcomes

GOALS	OUTCOMES
1.0:-A sustainable road transport system that serves the economic and social needs of the country	<i>1.1:-Properly constructed and maintained road network</i>
	<i>1.2:-A public transportation system that facilitates the movement of people, goods and services throughout Jamaica in a safe and efficient manner</i>
	<i>1.3:-Improved management of traffic on the</i>

	<i>road</i>
	<i>network</i>
	<i>1.4:-A road transport system which accommodates</i>
	<i>non-motorized transport</i>
	<i>1.5:-Increased provision and efficiency of road</i>
	<i>transport services</i>

Excerpt from the Vision 2030 Sector Plan 2009 – 2030 – Final Draft

Integration with the National Development Plan Under Vision 2030 Jamaica, each Sector Plan is integrated with the strategic framework of the National Development Plan. The Transport Sector Plan is aligned with the National Development Plan under the following National Goal and National Outcome:

*National Goal #3: Jamaica's Economy is Prosperous
National Outcome #9: Strong Economic Infrastructure*

There are five (5) National Strategies under this National Outcome that are relevant to the Transport Sector Plan:

- *National Strategy 9-1: Expand and rationalize land transport infrastructure and services.*
- *National Strategy 9-2: Develop a modernized public transport system*
- *National Strategy 9-3: Expand domestic and international air transport infrastructure and services.*
- *National Strategy 9-4: Expand and diversify maritime infrastructure and services*
- *National Strategy 9-5: Develop Jamaica as a regional logistics hub with multimodal transport linkages*

Consequently the implementation of the Transport Sector Plan will contribute primarily to the achievement of National Goal #3 and National Outcome #9 of the National Development Plan.

Additional data on the socio-economic investigations and economic cost-benefit analysis can be found in Attachment 12; Highway 2000, Preliminary Design Phase Economic Cost-Benefit Analysis

This was presented to Development Bank of Jamaica Limited, by Dessau Soprin, July 2000.

- a. Part of the FHWA Environmental Toolkit that assesses whether an EIA's purpose and need section is sufficient states that "data should be presented on such factors as reduction in vehicle hours of travel, improvements in travel speeds on the system, reduction in traffic accidents, injuries and fatalities, savings in cost to the traveling public, enhanced economic development potential, improved access to public facilities, etc." (FHWA 2012a). The roughly one-page traffic section (4.5.8 of the EIA) fails to provide detailed data concerning any of the aforementioned traffic factors and lacks in-depth analysis of current traffic issues and how the highway will improve the current conditions. The traffic section should provide an analysis of the current traffic congestion hot spots and provide some type of model to demonstrate how the proposed highway would improve existing conditions. Furthermore the traffic section goes on to state problems that will arise concerning the geometry of the current design of the Caymanas section of the highway alignment: "Along the H2K Caymanas alignment, there exist a number of access points including

road intersections, vehicular accesses and pedestrian accesses. Residential and commercial properties are attributable to these high numbers of access points. These access points are generally of poor geometry and pose challenges within the design of the highway. The implementation of the alignment divides some communities from their respective main towns, which poses grave problems. Furthermore, the road widening and road structures (ramps, bridges) at specific chainages along the highway increase the inconvenience of affected communities...pedestrians who are less concerned about the rapid transit of the highways, may be directly and permanently inconvenienced by the “uncrossable” barrier of the roadway, making (their) journeys subsequently longer.” (EIA, p. 254).

Response

The comment selectively left out sections of the paragraph. Also stated in the paragraph (EIA page 254); “The design of the alignment should consider the preservation of vehicular access at current intersections and roundabouts.” It also goes on to state; The legally protected right of local residents is essentially a concept of a social right-of-way which protects the public rights if the proposed roadway conflicts with the right of the public to move freely along a particular route. Therefore, wherever the highway crosses existing roadways the underpasses or overpasses will be done. These are listed in Section 2.2.2; Table 2.1 – Types and Locations of Crossings and Structures along Section 1; page 31.

The horizontal alignment shown in the EIA report is the conceptual/preliminary route of the proposed highway. During the development of the project design, all these local roads issues (maintenance of existing traffic, etc,) will be taken in consideration and feasible and practical solutions will be provided. The design of the highway is underway and it will be reviewed and optimized to avoid and to minimize any potential disturbance to the existing roads and existing traffic conditions.

- b. The report does little to provide alternatives to improve the problems listed above or to present sufficient data to suggest that the highway will improve traffic conditions. The only “data” provided to substantiate the claim that the highway would reduce traffic was listed under the benefits of the Caymanas to Linstead section of the proposed highway. “It was predicted that the reduction of traffic will vary from 30 to 35 percent entering Spanish Town from this route” (EIA, p. 254).

CL Response

The information was obtained from a 2008 traffic study conducted by Steer Davis Gleave Limited. This was quoted on in Section 4.5.8; page 254

Additionally, a comprehensive Traffic Impact Assessment and Analysis of existing and post-develop conditions will be done as part of the subsequent

documents. These documents will be reviewed and approved by the appropriate agencies before construction begins.

3. The main objective stated in the EIA regarding the purpose of the proposed highway is “to stimulate economic and social development and increase employment and thereby reduce poverty in Jamaica” (EIA, p. 2). The report provides a list of potential benefits the highway will have in regards to stimulating the economy but nowhere in the assessment does it provide data to substantiate these claims. Tellingly, the benefit appears to be primarily in “reducing production costs” (EIA, p. 4) a change that benefits the companies doing business but not necessarily the Jamaicans living in the area where the highway is planned.

The economic benefits sections of the report lists eight ways the proposed highway would act as a ‘catalyst’ for Jamaica’s economy but makes no effort to support these claims with any additional studies or data. Additionally, the first line of the economic benefits section states, “It is well documented that investment in transportation infrastructure generates substantial economic benefits by reducing transportation costs for existing activities, providing access to new areas with economic development potential and triggering investment activities” (EIA, p. 3). The EIA provides no additional documentation to justify this statement and it is not clear how the highway will broadly improve the socioeconomic status of the residents of Jamaica. Employment figures are provided in reference to data from the U.S. Department of Transportation and the Federal Highway Administration citing that there are approximately 2.5 indirect jobs and 1.8 induced jobs created for every direct job created (EIA, p. 4). The report does not, however, supply any monetary figures of what the highway project would contribute to the economy.

Response

Additional data on the socio-economic investigations and economic cost-benefit analysis can be found in Attachment 12; Highway 2000, Preliminary Design Phase Economic Cost-Benefit Analysis

This was presented to Development Bank of Jamaica Limited, by Dessau Soprin, July 2000.

4. It has been reported in the media that there will be some sort of commercial or industrial development also constructed in proximity to this highway. JET does not know if this is accurate, but the EIA makes no mention of where this might be located and what the environmental impacts of such a development will be. We remain concerned that these matters are dealt with in a piecemeal way – the highway is constructed and then it becomes clear that there will be an additional development, dependent on the highway, which is simply a done deal. We request the National Environment and Planning Agency (NEPA) to advise us of the details of this associated development.

Response

One of the many goals and expectations of the proposed highway is that while in operation, it will bring and generate future development projects along the proximity of the highway. These locations (commercial, industrial or residential developments) have not been identified yet. When the time comes and these areas are identified with the adequate planning these development projects shall comply with all established environmental permits and requirements by local and regional Government Agencies.

5. A final comment on the feasibility and economic justification of the highway is that one of the justifications offered is that agricultural activity will be enhanced because tracts of land will be opened for agricultural development (EIA, p. 3). But agricultural land will also be destroyed and or negatively impacted by the highway project (EIA, p. 192).

Response

The areas of affected agricultural lands (≈ 227.82 ha of the 3,102.01ha) a total of 7%, is a relatively small area. The benefits brought to the remaining agricultural lands are anticipated to out-weigh the loss of land. A net positive result to the agricultural industry is expected with the improved infrastructure brought by the project.

6. The project jeopardizes human health through increased; on-going air pollution The EIA does not include a health assessment review for nearby communities. The PM2.5 and PM10 standards are mentioned (EIA, p. 12) but the data are baseline values (i.e., pre-construction and operation), which makes them useless in assessing the potential impact of the project on human respiratory health. Indeed, the EIA acknowledges the higher particulate values associated with being near to a “busy commercial district and thoroughfare in the Linstead area (EIA, p 157). The other air pollutants, sulfur dioxide (SO₂) and nitrogen oxides (NO_x), were measured in areas “similar to” but not at the highway location itself (EIA, p. 159) for reasons which are not outlined. The EIA also states that “A report shall be prepared by a Contracted Party three months after operation of the Highway and then annually thereafter. The report will summarize the results of ambient air quality monitoring. This report will provide information relative to SO₂, NO_x, PM2.5 and PM10 concentrations in the project area” (EIA, p. 343). It is not clear how emissions discovered to be in excess of safe levels/standards found after the highway has been built can be reduced.

Response

Section 11.2 Air Emissions (EIA, p.343 – 344) clearly states that the data will be evaluated and professional opinion of the impact of the highway. It also goes on to say investigations and corrective actions will be taken.

To give the exact corrective actions at this stage is not possible. It will be based on the investigation. What if the exceedance of air emissions is a result of charcoal burning or other processes not related to the highway operation?

There are steps that can be taken if the operation of the highway causes the air emissions standards to be exceeded. These include;

1. *Public education of the dangers and other steps that can be taken.*
2. *Planting vegetation (trees) along the verges to reduce the spatial range of air emissions especially particulates.*
3. *Or last case relocation.*

We are confident that it won't arise to these measures as the volume of the vehicles expected along this highway alignment will be 5,000 per day or less (not a major highway). Another point to note is that this highway is not introducing additional (new) vehicles to the route but instead will be sharing the existing vehicular traffic heading towards the north coast. We anticipate that approximately 40% of the existing traffic to the north coast will use the highway.

- a. *It is possible, even likely, that vehicular emissions from this project could negatively affect air quality to an extent where human respiratory health may also be negatively affected. An epidemiological study in California found that normal lung development was substantially impaired for children living within 0.5 km of a freeway. Children tested at older ages had similarly compromised lung health. Since lung growth is essentially complete by age 18, these children began their adult lives with weakened lung capacity that would never improve (Gauderman et al., 2007).*

Response

It is possible but not probable or likely that vehicular emissions from this project could negatively affect air quality to an extent where human respiratory health may also be negatively impacted.

Whilst quoting a study and selecting sections that apparently strengthens this point, the author failed to give the setting (environment urban vs rural) and the vehicular traffic within the study area(s). That is when the above mentioned study is place in the Jamaican environment, it is not truly applicable.

The study was conducted in urban areas of the Los Angeles basin. These urban areas have high population densities/buildings. This is of note as there is a large volume of local vehicular traffic within these areas therefore one cannot attribute the highway as the main source of air pollution. It is also important to note that when a vehicle starts up in the morning (cold start) is when the emissions are highest. This is because the first few minutes of driving generate higher emissions because the emissions-control equipment has not yet reached its optimal operating temperature (U.S. Environmental Protection Agency). This could potentially be adding to the exposure of persons/children living near the highways in the study. This effect would be largely reduced in rural areas that would not have a high concentration of local traffic. Also emissions rates are higher during stop-and-go, congested traffic conditions than free flow conditions operating at the same average speed.

Secondly, the number of vehicles using the highway per day is another factor. As per Figure 1 below the highest concentrations of children with asthma were found in proximity of roads >25,001 Annual Average Daily Traffic (AADT). We anticipate

that the AADT for this leg be approximately <5,000 which is approximately one fifth of the traffic in the Gauderman study.

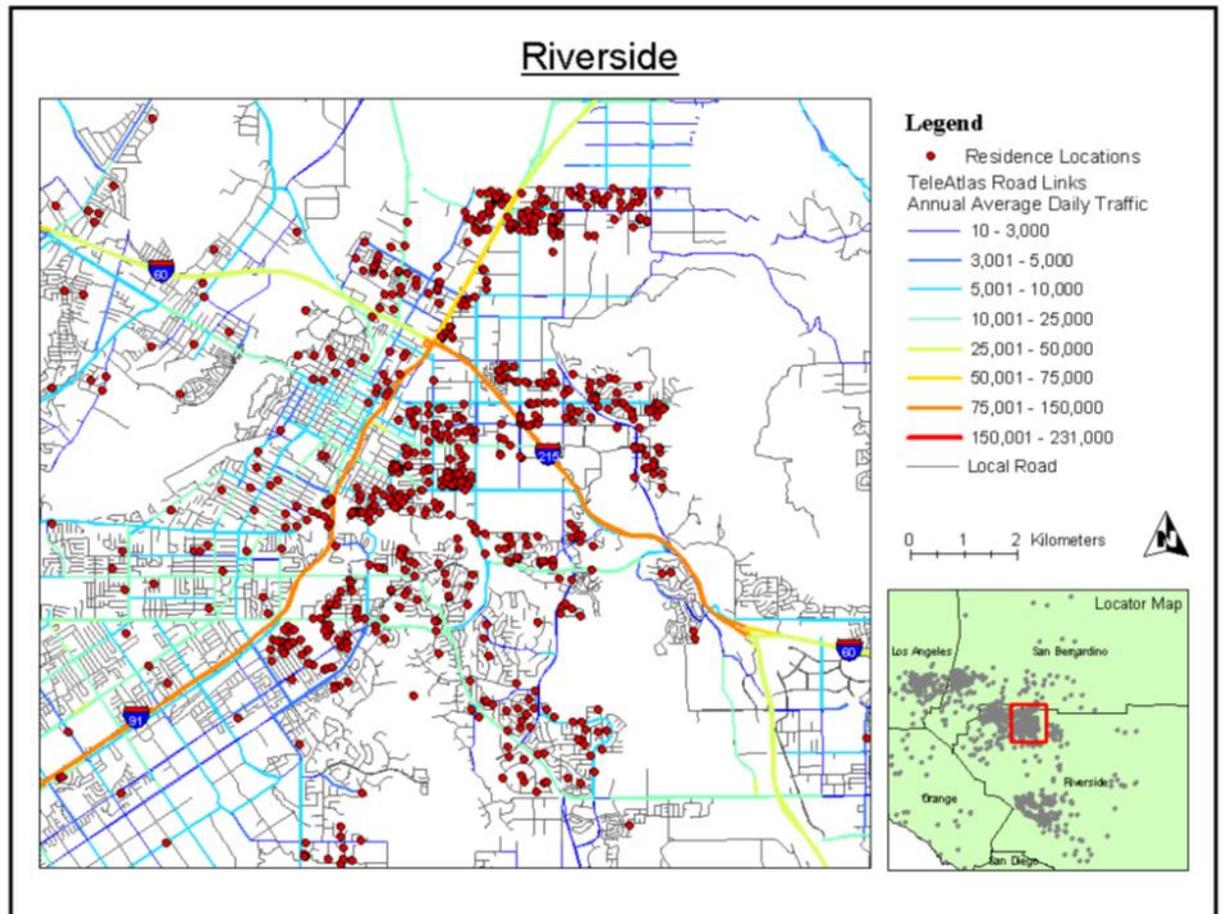


Figure 1 Showing asthma distribution around roads with varying AADT (adapted from Gauderman et.al, 2007)

- b. A proper health assessment of nearby communities would at least assess these risks and inform community members of the dangers.

Response

A health impact assessment of these communities is outside of the scope of this EIA, that is, it was not a requirement in the Terms of Reference.

However, as stated above, using the literature cited, the possible air pollution impacts from the proposed highway along with the expected or resultant vehicular trips (traffic) of the project will not result in the pollution/hazard values expounded in the literature. Therefore the potential risks that are being highlighted are very low.

7. The project may endanger the public drinking water supply. Fresh water contamination is likely to occur with this project. Sedimentation from erosion combined with sheet flow runoff from excavation and construction in the short term

and increased percentage of impervious surfaces in the long term will impact water quality. The runoff from the added impervious surfaces and all the accompanying toxics (e.g., metals, PAHs, salts) that inevitably increase when a road is put in is also likely to cause flooding, further heightening the potential for contamination. In Chapter 4 of the EIA, the “common highway impacts on the local ecology” are listed (EIA, p. 191). Pollution from increased runoff is not listed among these impacts.

Response

*The runoff levels from the highway have been assessed using the 100year return period. From Table 6.4 within the EIA, Runoff from proposed highway, an increase of 0.7 – 1.95% was calculated for the catchment areas within the alignment area. The potential increase of sedimentation and debris flow to the environment was noted and several mitigation practises have been suggested. During construction, practises to help offset sedimentation such as covering materials and installation of silt fences have been discussed in Section 9.1.2. To address localized flooding in flood prone areas, culverts and bridges have been suggested to mitigate this problem with the inclusion of detention ponds (Section 6.2 and Section 9.2.1.2). **Error! Reference source not found.**3 outlines the Sediment Management Guildelines.*

Possible contaminants to the environment from runoff even though not stated explicitly have been included in Section 9.1.3 along with mitigatory factors. Salts were mentioned as a contaminant; however, this is not used on roads in Jamaica. Steps have been included in both the construction and operational phase of the Highway to minimize contaminants.

In addition the Water Resource Risk Management study is being conducted, which will provide additional insight and recommendations for the prevention of any potential contamination

8. The hydrology section of the report identifies eleven wells that are owned and operated by private and government entities. The proposed highway will “easily cover these wells and furthermore may lead to their destruction and/or contamination” (EIA, p. 10). No information is provided about how many people this loss will affect. Much of the project area is on limestone and karst soils, through which water penetrates rapidly without filtration. These conditions result in a greater potential for contamination.

Response

The horizontal alignment shown in the EIA report is the conceptual/preliminary route of the proposed highway. The EIA correctly identifies all the wells that are located in the vicinity of the conceptual layout. The developer/contractor will take in consideration all the existing wells among some other constrains to develop and optimize the design in a way to avoid and minimize any impact to vital existing facilities. The Water Resource Risk Management Plan being developed will address the issues mentioned.

9. There is surprisingly little detail in the mitigation plans offered in the EIA and it is concerning that much of the critical information needed to make good decisions about the project has yet to be collected. For example, the mitigation for water resources includes, “a dedicated mapping exercise” that “should be undertaken to identify all vulnerable sink holes” (EIA, p. 322). It is remarkable that the project proponents have not yet conducted this study. How is it possible to assess risk to a critical public good (clean water) and to public safety (ground stability) without knowing where all the vulnerable sinkholes are? And if this survey has yet to be conducted, on what are the proponents basing their figure of 28 sinkholes in the project area (EIA, p. 10)?

Response

The highway alignment is still in the outline phase and realignment of the route is being done so as to minimize the number of wells and sinkholes directly affected. For any wells that might be unavoidable, certain measures along with WRA recommendations will be implemented and will be covered in the Water Resources Risk Management Plan.

The sinkholes in the study are determined based on contours however part of the Water Resources Risk Management Plan entails ground-truthing.

10. At the public meeting the EIA consultant advised that a Water Resources Risk Management Plan would be developed concurrently with the permitting process. JET would like to know whether this plan has since been developed. What is going to happen if the risks to ground or surface water prove to be unacceptably high? Surely the decision to proceed with this road should await the completion of the Water Resources Risk Management Plan?

Response

The number of wells present in the area had been obtained from a database (compilation from WRA, NWC). These wells are presently being assessed by a team to determine their status, that is, if they are active, abandoned or exploratory. This will aid in the development of the Water Resources Risk Management Plan which is presently being developed. As stated above, the alignment is still in the outline phase and realignment is still possible.

11. The route for the road includes unstable areas prone to landslides. Both soil and ground stability in the region where the highway is planned are major concerns for this project. As reported in the EIA, 13 of 14 soils are prone to erosion. One of these soils—Bonygate Stony Loam—is “the most predominant soil group within the middle third of the alignment” and is extremely susceptible to erosion (EIA, p. 9). Excessive erosion can result in instability where the soil is lost and contamination (as noted above) in areas where the soil is deposited.
- a. Concomitant with the erosion risk, part of this route is planned to cross steep mountainsides that are prone to landslides (EIA, pp. 11-12). The route covers

limestone areas that are extremely friable as well as fault zones with “extensive brecciation,” including the Bog Walk Fault Zone (EIA, p. 9). Brecciation results in serious soil and slope instability (Sibson 1986). The EIA states that “the proximity of the highway alignment just east of the Cretaceous units (in the Gibratore area) should be noted as these units are most likely to be much more susceptible to erosion and slope failure” (EIA, p. 10).

- b. Indeed, the lead “Hazard” for this project, listed in the Executive Summary of the EIA is the following:
 - i. “The Bog Walk Fault zone consists of a broad belt of mainly limestones that have been extensively brecciated. The brecciation will result in potentially unstable slopes being exposed during and after construction of the highway, so the potential for landslides is high. If the highway route also intersects slivers of volcanoclastic rocks (Cretaceous units), presently just west of the proposed route in the Gibratore area this potential will become even higher. Active landslides have been encountered along, or in the vicinity of, the proposed highway route” (EIA, p. 11).

Response

The final highway alignment will consider both the location of fault zones as well as other potential stability issues. Where the highway crosses a fault zone, there are several engineering procedures that can mitigate any potential hazards where realignment is not the preferred option. It must be pointed out that the highway must cross this Bog Walk Fault Zone no matter what alignment is used.

The geotechnical studies are currently being done; this will guide the engineering solutions that will be used to prevent land slippages and breakaways, along the highway corridor.

- ii. Further, on Page 131, the EIA says: “The road network which was examined included all the major and minor roads throughout the island of Jamaica. The conclusion was formed that some landslide types appear to correlate strongly with distance to roads. It was observed that as the proximity to the roads (buffer area) increased, there was a sharp decrease in landslide frequencies. Almost 30% of all existing landslides occurred exactly at locations where roads were cut regardless of any other present factors. This gives a basis for developing a relationship between the events of landslides and road locations. In comparison to faults, over one hundred (100) more landslides had transpired within proximity to roads than fault lines.”

Response

This was used as a basis for modelling the landslide susceptibility for the entire island as stated on pages 133 – 134.

The geotechnical studies are currently being done, which will guide the engineering solutions that will be used to prevent land slippages and breakaways, along the highway corridor.

- c. It seems that planning a major highway through areas with fault zones, landslides and steep and eroding mountainsides presents a potentially a serious risk to public safety. In Chapter 2 of the EIA, which describes the project, almost no detail is provided about how much cutting through mountainsides, bulldozing, and clearing is needed. At this stage in the process, project designers should have a much clearer understanding of exactly what precautions will be taken at each section of the road and how many acres they will be bulldozing. The construction details are too vague and invite concern that the project will not be conducted in a safe or environmentally sensitive way.

Response

The Highway alignment is still in the outline phase and realignment of the route is still being done to minimize impacts.

The geotechnical studies are currently being done; which will guide the engineering solutions that will be used to prevent land slippages and breakaways, along the highway corridor.

12. The project is highly likely to increase flooding in the area. The hydrology section states that “four rivers cross the area of the proposed highway within a 4 km radius of Linstead town while a fifth (Rio Cobre) traverses the alignment in the Angels area. These rivers are known to have large flood plains and tend to swell rapidly and overtop their banks during extreme weather” (EIA, p. 11).

Response

Flood plain mapping from historic data and flood plain analysis will be conducted to identify existing flood prone areas for the five rivers. Section 9.2.1.2 describes suitable drainage mitigation measures that can be used to ensure that the alignment does not exacerbate existing conditions for the 100 year return period.

The increased flows (runoff) as a result of the proposed highway were calculated in Section 6.2.4 (page 307 - Runoff Impact). Table 6.4 – Runoff from proposed highway details the expected increase in runoff as a result of the proposed highway. The highest increase post highway construction is expected to be 1.95%. Therefore the increase runoff from the highway itself is not large.

What is of importance is the potential impact on the highway infrastructure from existing water bodies overtopping their banks during extreme weather.

13. Much of the alignment for the highway is built in a flood plain and it is hard to imagine that increased flooding will not occur as a result of increased impervious surfaces and structures where water used to flow and percolate freely. The project proponents have identified that rainfall is increasing in Jamaica (they attribute the changes to climate change) and they suggest that extreme events are going to be more likely. Given this reasoning, it is surprising that the specific information needed to assess flood concerns has not yet been collected. In the mitigation chapter, the proponents state that, “flood plain mapping from previous storms and flood plain analysis should be conducted to identify the existing areas which are prone to flooding for all five major rivers” (EIA, p. 328). The mitigation chapter also includes a call for a “hydraulic report that meets and exceeds the requirements of the National Works Agency” (EIA, p. 329). The proponents did interview a number of longtime residents, all of whom recalled major flooding events. Given these insufficient data, it is remarkable that the proponents conclude that storm water and drainage issues are considered to be “minor, local, local, small” impacts (EIA, Table 6.1, p. 292).

Response

As stated above the calculated increase runoff as a result of the highway is small. However, the main way in which the construction of the highway would increase flooding would be the restriction of the existing flow path way (creating a barrier) thereby, causing ponding/flooding. It is therefore important that these flows continue unimpeded under the highway and that was why a hydraulic assessment was recommended to ensure that the bridges, culverts etc. are adequately sized so that the flows are not restricted. Attachment 10 and 11

14. The biological and habitat impacts have not been sufficiently addressed
- a. The surveys done on the animal species in the area were inadequate. The EIA states that avifauna and invertebrates were studied (EIA, p. 219); it is not clear why mammals were not included in the surveys. Additionally, snails are referred to as arthropods but they are from the phylum Mollusca. The EIA states, “The Arthropod fauna is also improvised, with a maximum of 13 land snails and 10 arthropod species recorded for any area” (EIA, p. 219). It is not advisable to “improvise” any survey data for a project of this magnitude.

Response

JET was correct in making the point that “The surveys done on the animal species in the area were inadequate”. Unfortunately only one of three fauna assessment reports which was carried out throughout the area for the proposed highway project was placed in the final report. The full faunal reports are attached as Appendices A to D (Attachment 5), and will be added to the second draft of the EIA report.

*The comments made about the assessment of mammals were also addressed will be addressed in the second draft of the EIA document. It should be noted that the vertebrate surveys carried out in the area include presence/ absence surveys for the Jamaican Coney (*Geocapromys brownii*), wild pigs, bats and*

mongooses. All the information on the vertebrate assessments will be placed in the second draft of the EIA report.

- b. With regard to the highland areas, the satellite photos presented seem to show healthy forest. The EIA describes this forest as “disturbed lowland/sub montane seasonal evergreen rainforest. Here, the forest floor was quite rocky in most areas associated with approximately 45-60 degree slopes. These factors appeared to result in little to no accumulation of soil or detritus at these locales. Access to the vegetation existed mainly in the form of overgrown tracks and pathways... asphalted surfaces were virtually non existent in higher elevations...”

Response

The Flora survey team has stated that ‘Uncharacterised satellite imagery may show areas as possessing "healthy" green vegetation but proper imagery interpretation followed by ground-truthing is key’. What was found on-site were disturbed forest communities as stated within the EIA.

Tree density in the forested areas were given and as such the potential area of forest to be removed may be determined from deriving the area of the proposed highway footprint.

Indeed the highland areas surveyed appeared less disturbed than lowland areas; however, evidence of anthropogenic influence was quite clear (pp. 194 - 197). What was found on-site were disturbed forest communities (pp.194 – 197) namely, disturbed dry limestone forests (p. 204); disturbed thorn thickets (pp. 205 & 207); subsistence agriculture (pp. 207 & 209); and disturbed mesic limestone forests (pp. 211 – 214).

Uncharacterised satellite imagery may show areas as possessing healthy, undisturbed vegetation. However, those images may be misleading without proper interpretation and ground-truthing.

- i. What is going to happen to these forested areas? How much forest will be directly removed and how much will be lost indirectly, once roads are opened up to an area which now is only accessible via “overgrown tracks and pathways.” The identification of potential impacts matrix rates the significance of “vegetation” removal as “minor” and “small” and is dismissed in the EIA with a paragraph (p, 297): “The construction of the road creates a potential for a negative impact on the forest. The road might create easy access to sections of the forest which was not accessible (sic). This will cause degradation of the forest, which will have an indirect effect on forest specialist (sic). However, there is a significant amount of forest in the area and forest specialists can migrate to the adjoining forest.” There is no mention of

the extremely well documented “edge effects” of forest removal on birds and plants.

Response

Tree densities in the forested areas of the western highlands were given (pp.207 – 215) and as such the potential area of forest to be removed may be determined by deriving the area of the proposed highway footprint. This activity will be carried out in the additional studies component of the project.

The impact of vegetation clearing would vary from locale to locale but overall should be of major magnitude and large significance especially for forested highland areas.

Excerpt quoted (in section 14.b.i. above) does not demonstrate the ‘dismissal’ of the impacts to forest vegetation by the flora team: rather quite the contrary.

- c. Habitat fragmentation caused by road construction has severe and permanent impacts on a multitude of plant and animal species (Trombulak & Frissell 2000). Behavior is altered (e.g., some species avoid the noisy and bright roads, others are drawn to them when scavenging for food or seeking heat) and wildlife collisions will increase with the addition of the highway. Despite these certain impacts, the EIA states that there will be no impact because the species at risk are common (population numbers not in jeopardy) and the avifauna and forest specialists will simply migrate elsewhere (EIA, p. 297). These kinds of justifications are not based in scientific fact. Population density plays a critical role in species’ health and survival; reduced habitat can cause crowding if the animals manage to migrate successfully, and existing food and water resources may be depleted. It is also possible that microhabitat differences and other unforeseen barriers will prevent migration. This eventuality is not included in the EIA. In fact, the project proponents state that for freshwater bodies near the project site, “it is fully expected that the community will return to its current composition within a few months of the cessation of construction activities” (EIA, p. 298).

Response

The paper JET reference in their document is a good review of the effects of Highways on the environment in the North America. JET had failed to mention that most of the examples in the paper look at large vertebrates such as Moose, Bears, and Mountain Lions that are not found in Jamaica. It should be noted that Jamaica only has a few large vertebrate’s species such as Yellow Snake and the Jamaica Cony that the highway would have an effect on in terms of road kills. Both animals were not seen at the sample sites in the study; however they could be presence in the area.

The construction of the highway will have an effect on several invertebrate species in terms of fragmenting the habitat. However, detail arthropod surveys were carried out in the area to acquire baseline information on the arthropods present in the area.

Edge-effect, forest fragmentation and related mitigative recommendations are referred to and discussed throughout the Consultants' report (pp. 19, 191, 295 & 323).

- d. It is unlikely that there will be no impact on freshwater habitats and wetland areas. According to Section 4 of the U.S. Clean Water Act, wetlands are “areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.” The EIA for the proposed Highway 2000 project does not indicate that the highway will pass through, fragment or destroy any wetland ecosystems. However, a map showcasing the different land uses in the surrounding area does indicate that Herbaceous Wetland ecosystems do occur in the surrounding area (EIA, Fig. 4-28, p. 115). In the United States the Hydrogeomorphic method is the approach used for the functional assessment of a wetland under Section 404 of the Clean Water Act and the USDA wetland programs and is recognized by the ACE, EPA, FWS, USDA and Federal Highway Administration. Wetland delineation is done by the U.S. Army Corp of Engineers and a permitting process is required for the mitigation of wetlands.

Response

No wetlands will be impacted by the alignment of the proposed alignment. Figure 4-28, p 115 as quoted above was based on the Land use map generated by TNC. This was achieved by using image analysis (satellite classification) using a software. This is a quick way of doing large areas using pixel signature to determine the classification. However, this needs to be ground truthed. We actually did the ground truthing and areas that are classified as wetlands are in fact cane lands (Caymanas and Bogwalk area).

This information was used in hydrological modelling of the catchment area. For the purposes of the modelling the cane fields act similarly to wetlands therefore it was not necessary for any adjustments to be made and therefore would not affect the results of the modelling.

*‘Traditional’ marine wetlands were not encountered by the flora team in their surveys of the road-footprint. However, an area of inland water-inundation was realised in the “south-eastern lowland areas” (Location B, p. 202; plate 4-36; and fig. 4-92) where waterlogged areas containing *Typha domingensis* are described. This location was severely disturbed, located adjacent to sugarcane cultivation and fallow lands nearby dwellings (plate 4-36). The only other area with wetland potential was at Dam Head (Location J, p. 207); yet vegetation similar to Location B was not encountered.*

- e. The mitigation section of the EIA does not take into account the possibility of having to mitigate wetland losses surrounding the proposed highway. Water quality issues and standards provided in the EIA state that several wells

located near the alignment already fall short of NEPA standards for pH and Total Dissolved Solids, “TDS values for WQ1, WQ4, and WQ7 were non-compliant with the NEPA freshwater standard” (EIA, p. 149). The sensitivity of the watershed areas of the proposed highway alignment requires greater protection of the freshwater resources.

Response

Not necessary as no wetlands will be impacted/removed by the construction of the proposed highway (see explanation above). The area of inland water-inundation located in the “south-eastern lowland areas” (Location B, p. 202; plate 4-36; and fig. 4-92) was described as severely disturbed. The only wetland-typical flora found (i.e. Typha sp.) was restricted to an overgrown, unmaintained, man-made canal.

- f. JET questions the entire Identification of Potential Impacts matrix (EIA, p 291). Virtually all the significant impacts to forests, wildlife habitat, water, land use, the risks of flooding and landslides are rated as “minor” and “small.” The only impacts which are rated as having a large effect are employment, community fragmentation, air pollution, and almost all of the socioeconomic parameters. This major highway project is basically rated as having negligible environmental impacts, despite clear descriptions of a range of risks in other parts of the document. We simply do not find this to be credible and NEPA should refuse to accept it.

Response

We are prepared to reassess the Impact Matrix. See response to 14.b.i, above

UDC COMMENTS

1. Hydrology a 50m buffer was established along the proposed alignment due to the occurrence of numerous sinkholes and various depressions; this resulted in wells being impacted which are proposed for abstraction within the CEDA. However, these wells are not named within the document, and in fact it was noted that some of the names presented are not wells within the purview of the proposed highway alignment. This needs to be addressed.

Response

The wells named in the EIA are from a database set, however a more in depth survey of the wells and sinkholes in the area is being carried along with WRA recommendations for the development of a Water Resources Risk Management Plan

2. The alignment is said to end at the Fresh River/Mandela crossing by Ferry. While not crossing the river, a section of the highway is within the Fresh/Duhaney River catchment. The impact on the catchment on the proposed highway cannot be

underestimated and a detailed analysis should be undertaken. A Strategic Environmental Assessment conducted on behalf of the UDC suggests that the area proximal and south of Moses Lake would be impacted by 100 Annual.

Response

The EIA for the proposed highway took into considerations what potential impact on the catchment in the Fresh/Duhaney River catchment. Section 6.2.4; page 307, Table 6.4 – Runoff from proposed highway and Figure 6-2 Proposed culvert openings and bridges along the alignment deals with the potential impacts.

The proposed culverts in the Fresh/Duhaney River catchment are in similar locations to that proposed in Strategic Environmental Assessment conducted on behalf of the UDC for the CEDA.

3. Flooding In addition to the above, the area of connection from Mandela Highway into Cayman as Estate is noted as being a flood prone site by the ODPEM. However, the EIA states that flooding is not likely to be a major problem at Caymanas due to the slope of relatively permeable alluvial fan deposits, toward the northern edge of the estate. It further states that this is not a floodplain.
 - a. However, this statement will need to be evaluated, especially with regards to where this 'non -flood prone' area is. The Caymanas site is known for its high water table and flooding potential across the site especially in areas toward which the land drains.

Response

The statement was made based on the calculated runoff from the highway and the proposed placing of culverts.

4. Impact of developing the highway over sinkholes must be carefully analysed to ensure that there are no negative impacts on the existing drainage system and the aquifer which may be fed by some of these sinkholes.

Response

That is being done Water Resources Risk Management Plan which is currently being carried out.

5. Wells
 - a. No mention was made of the several wells located within Caymanas, although 4-17 shows two being impacted by the alignment.

Response

The two wells that were not listed in Table 4.5 (pg 85 of the EIA) are Mount Gotham CH 1 and Caymanas Bay (Grass Piece) but are shown in Figure 4-17 (pg 88 of the EIA). The general mitigation guidelines apply to these also.

6. Quarries

The EIA states that Black Brothers quarry (which is adjacent to the UDC owned quarry) generates weak limestone which is not suitable for road construction. However, there are two locations noted on the site map given, and it is possible the UDC quarry was not accounted for. The UDC has 12 lots at Ferry earmarked for quarry development.

Response

Both NROCC and CL Environmental have separately requested from the UDC; the plans for the Caymans Estate Development Area (CEDA). In fact NROCC has had meetings with the UDC discussing the proposed highway project and at no time were CL Environmental or NROCC supplied with the proposal and or any other documentation regarding the CEDA. Therefore the proposal regarding 12 Lots earmarked for quarry development would not have been known. For the study the database of licence quarries from the Mines and Geology Department was queried, these are listed in the EIA (Table 4.14, Page 119-120). NROCC will gladly consider all viable and approved quarries for use within the project.

7. Ambient Particulates and Ambient Noise Climate

In all the samples and measurements taken at the Caymanas Bay station (this is the area within the CEDA through which the H2K will traverse -that in fact has the highest propensity to have noise and/or air pollution) it was noted that there was compliance with the NEPA ambient standards.

- a. Table 6.5 provides a comparison of predicted noise levels. It was noted that no reading was done for Caymanas Bay due to the community being 800m away. To compensate for that, a reading should have been done from the Caymanas Village which is much closer. Additionally, while supporting the development of the Highway, New Era Homes indicated that their concern was impact of noise to be generated from the highway on their Caymanas Country Club Estate development; therefore why wasn't an alternate site chosen?

Response

Noise readings (baseline) were in fact taken for Caymanas Bay (Section 4.1.10.2; pg. 164). Comparisons were done for the baseline noise data with NEPA day and night guidelines (Table 4.36; pg. 183) and the Federal Highway Administration noise standard used for planning (Figure 4-79; pg. 184).

What was not done was to report the predicted noise level at Caymanas Bay as at that distance the noise that would be generated (38.2 dBA daytime & 36.7 dBA night time) a difference of more than 10 dBA with the baseline levels (53. dBA – day and 45.4 dBA – night), hence having no impact on the existing daytime noise climate and minimal impact of half a decibel (45.9 dBA) in the night time noise climate at Caymanas Bay. Persons do not detect changes in noise less than 3 dBA.

Figure 6-4; pg. 313 illustrates the noise levels expected based on the noise model.

Furthermore, no compensation was needed as the noise model can predict the noise generated by the operation of the highway at any point.

The noise that is expected to be generated by the operation of the highway can easily be dealt with by using noise walls; therefore the changing of the alignment (curves, speeds, etc.) is not necessary.

8. The EIA needs to recognise that there are two (2) other communities that need to be noted in Caymanas Estate; these being the existing Caymanas Estate Village and Caymanas Glade. Refer to Page: 227 and Table 4.41.

Response

As stated above the noise model can provide predicted noise levels from the highway at any point. Therefore to list every settlement or town was not necessary.

9. Future Developments

- a. More information could be presented on the plans of the UDC to develop Caymanas Estates through a summary of the proposals. Not recognising, the proposals for this area may impact the analysis under section 4.5 Socio-Economics. Of significance to the UDC is the current residential development being carried out by New Era Homes 2000 Limited and the proposed high income residential development slated for lands surrounding the Caymanas Golf and Country Club. The highway, from construction through operations, will have some impact on these developments. Additionally, the UDC development proposals must be analysed to address the overall hydrological impact.

Response

Additional hydrological information can be seen in the Research Report on Flood Disaster Control Program of Caymanas Economic and Technological Development Zone, by CCCC, August 2012 (Attachment 10)

10. Community Perception It is noted that none of the Caymanas communities were included in the interviews, even though these persons will be directly affected by the highway, particularly during the construction phase.

Response

We note your concern. However it should be pointed out that that the closest community is more than half a kilometre south of the proposed highway alignment and Caymanas Bay approximately 800 m north of the proposed highway alignment therefore would not be directly affected.

When construction is to commence, adequate notices and meetings will be held to inform the communities and adequate mechanisms will be put in place to minimize any dislocation where it crosses the Caymanas Bay main road.

11. Water Resources Risk Management Plan There is support for the undertaking of the water resources risk management plan especially since the wells within the Caymanas Estate are critical to the provision of the utility to the develop men area and beyond.

Response

The Water Resources Risk Management Plan is currently being carried out.

List of Attachments

Attachment #	Description
Attachment 1	NEPA Letter December x 2012
Attachment 2	NEPA Letter December 17, 2012
Attachment 3	Generalised Guidelines for the Treatment of Sinkholes
Attachment 4	Treatment of Sinkholes
Attachment 5	Additional Faunal Surveys
Attachment 6	Forestry Management Draft Management Plan
Attachment 7	General Drainage Guidelines
Attachment 8	Preliminary Project Schedule
Attachment 9	Letter addressing the acquisition of Hampton Estate lands
Attachment 10	Flood and Disaster control management plan for Caymans Estates
Attachment 11	Storm Water Management Statement
Attachment 12	Highway 2000, Preliminary Design Phase-Project Economic Cost-Benefit Analysis
Attachment 13	Sediment Management Plan