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 Stage 1 Environmental Impact Assessment  
 Addendum**

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## **APPENDICES**

APPENDIX A - Copy of Public Notice and List of Posting Localities

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APPENDIX C - Copy of Press Advertisement

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APPENDIX E - Transcript of the Public presentation Q&A Session

APPENDIX F - Copies of Comments Sheets Received from the Public Presentation

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# 1. INTRODUCTION

## General Background

- 1.1. The Environmental Impact Assessment (EIA) for Stage 1 of the Port Antonio Water, Sewage and Drainage Project (PAWSDP) prepared by Kellogg Brown and Root (KBR) was submitted to the National Water Corporation (NWC) in April 2006, and subsequently to the National Environment and Planning Agency (NEPA).
- 1.2. In their approval of the EIA Terms of Reference in February 2006 NEPA had previously stated that a Public Presentation of the findings would be required in accordance with Principle 7 of United Nations Environment Programme<sup>1</sup>.
- 1.3. This Presentation was held on Tuesday 15th August 2006.
- 1.4. In the lead-up to the meeting, NWC made hard copies of the EIA available for public reference at the following locations:
  - Portland Parish Council, Port Antonio;
  - Port Antonio Public Library;
  - National Water Commission, Port Antonio; and,
  - Portland Environmental protection Authority, Port Antonio.

In addition, copies were available for downloading via the Internet from [www.neap.gov.jm](http://www.neap.gov.jm) and [www.nwcjamaica.com.jm](http://www.nwcjamaica.com.jm).

- 1.5. In accordance with NEPA Guidelines<sup>2</sup>, 21 days notice of the Presentation was publicised through:
  - Public Notices, drafted in accordance with Appendix 1 of the Guidelines, were posted by NWC on Tuesday 25th July 2006. A copy of the Notice is given in Appendix A together with the locations at which it was displayed;
  - Written invitations to the Presentation were distributed to members of the PAWSDP Advisory Monitoring Committee (AMC) and others as listed in Appendix B;
  - Press advertisement, a copy of which is given in Appendix C, in The Gleaner and The Observer on Wednesday 9th and Monday 14th August 2006; and,

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<sup>1</sup> *Goals and Principles of Environment Impact Assessment*. UNEP Decision 14/25, June 1987.

<sup>2</sup> *Guidelines for Conducting Environmental Impact Assessments*. NEPA, August 2005,

- Public Address via the Town Crier, advertised the Presentation within Port Antonio town on Monday August 14th at around 6pm, to catch residents making their way home after work, and on throughout the day of Tuesday 15th August, the day of the presentation, to inform the business and commercial community and shoppers.
- 1.6. Notice of the presentation was also broadcast on the Satcom Cable Television Network, Channel 12 covering most of East Portland and part of West Portland, from 8th to 15th August. Each day during this period it was shown 8 times between 1000-2200 hrs and was one of some 30 rolling adverts from 2200 to 1000 hrs. Satcom also filmed the whole proceedings to provide a video record and to enable it to be broadcast subsequent to the meeting.

## **2. PUBLIC PRESENTATION**

- 2.1. The Presentation was held in the Charles M. Robinson Assembly Hall of Port Antonio High School and commenced at 6.30 pm.
- 2.2. The meeting agenda followed the format suggested by Appendix 2 of the NEPA Guidelines. The Moderator was Mr. Colin Bell, Programme Director of Satcom Cable Television Network, Director of Portland Chamber of Commerce and Secretary of the Port Antonio Resort Board. After his welcome and introduction, which included an explanation of NEPA's EIA process, Mr. John Maziliauskas, Project Manager for KBR, NWC's PAWSDP Design and Construction Consultant, explained the scope and location of the proposed engineering works. Dr. John Davey, KBR's Environmental Consultant and Principal Preparer for the Stage 1 EIA, then presented the results of the EIA and the proposed Environmental Management Plan. Thereafter the meeting took on the style of an Open Forum for public comments and questions.
- 2.3. The meeting concluded at 21.15 hrs. There were 69 attendees, 56 of whom signed the registration sheet. The list of attendees that registered is given in Appendix D.

## **3. COMMENTS, QUESTIONS AND RESPONSES**

- 3.1. Attendees at the Public Presentation were given the opportunity to give their comments, air their concerns and ask questions both orally and in writing. Comments, questions and their responses given orally were recorded verbatim by a stenographer and are reproduced below with only grammatical errors amended to aid understanding. The original transcript is given in Appendix E. Those comments and questions presented in writing are also reproduced below, with the original comment sheets given in Appendix F.

- 3.2. The comments and questions are reported in italics and followed by the un-italicised response.

## Oral Comments and Questions

### 3.3. From Colin Bell

*How does the time period for Stage 1 affect the construction of the North Coast Highway Port Antonio?*

#### **Response from KBR**

With regards to the highway, we are communicating with the relevant authorities. The program for the road is independent of PAWSDP. Road construction finishes on the west side of Port Antonio and does not impact upon the PAWSDP works. If everything goes according to plan the earliest we could hope construction will start will be in six months. We are not sure how the highway construction ties in with that.

### 3.4. From the National Works Agency

*We are concerned about the drainage plan. The local NWA Portland team needs to be a part of it.*

*In regards to Cane side River, will you do any protective work?*

#### **Response from KBR**

The drainage plan is not finalized. When we have the meeting to sign off on the project the local NWA representatives will be invited.

When we remove the old bridge structure we will put in gabions to stabilize the bank. We have been talking to NWA in Kingston and I am surprised to hear you are not aware of the plans. You should ask your head office because we have been talking to them.

### 3.5. From Bent Khristensen

*I am concerned about the roads being dug up for long periods of time. There is no alternate route for traffic in regards to the main road leading to the Court House. We are asking that the Port Authority make their road, which runs alongside the Port Antonio Marina and Yacht Club to the public park, to the Village of St. George, available for use.*

#### **Response from KBR**

You raise important issues. On the more general issue, the contractors will not be allowed to dig long lengths of trench and leave them open for extended periods of time. Pipe laying and backfilling will have to follow excavation to ensure trenches are not kept open unnecessarily.

There will be a problem in terms of alternate route. The road by the marina is the obvious possible diversion. It is not up to KBR to determine where the diversion will take place. Port

Antonio is congested. The short term congestion will get worse but we will do our best to alleviate it.

3.6. **From Dr. Donald Rhodd**

*After desilting and removal of the bridge at Caneside River, will there still be a problem with flooding in areas such as Baforhole, about 400m away. This area has always been flooding and has always been a problem. Have your studies shown that desilting and removal of bridge will alleviate this problem?*

**Response from KBR**

We understand the concern. We are looking at the area by Caneside River. There are two problems there. The problem with flooding is not just associated with the collapse of the bridge. It has a lot to do with the area being low lying. A large volume of water is coming off the mountains to the flatter areas. We are intercepting the streams carrying this water with a culvert along Sommerstown Road. By virtue of doing this we will divert a large volume of the water that previously caused flooding.

3.7. **From the National Works Agency**

*You will be installing culverts. Will they be running through private properties? 25 feet from the main road is public property and beyond this is private property.*

**Response from KBR**

The culvert in Sommerstown Road will run beneath the road, within the public ownership corridor

3.8. **From Dr Donald Rhodd**

*There is a river close to this community, the Barnett River, which causes flooding of the Boundbrook community. The Parish Council use heavy equipment to desilt the river but there is still flooding at times.*

**Response from KBR**

We are following the Master Plan proposals. The river you mention is outside the present scope of works. You need to ask NWC if alleviation for the Boundbrook area can be included in the project.

*There is a projected expansion of the town. There are a number of housing projects, schools etc. planned How has this been injected into the plan?*

**Response from KBR**

The amount of water we will be providing covers the area from Rio Grande to Port Antonio and Fairy Hill. A number of developments have been planned and they are taken into account in our proposals. In terms of providing water, this project will provide high pressure mains to deliver water to the areas east and west of Port Antonio town centre.

*Is Stage 1 of the project only concerned with distribution and not water source?*

**Response from KBR**

Yes. But under Stage 1 we will provide high pressure to enhance flow to the areas to the west. Under Stage 2 a new main will be provided to enhance pressure to the east.

*I was previously told that the project will begin in November to December. I am now hearing that you will be starting in six months time. People are getting anxious and frustrated. Is this the final start up date? What is causing the delay?*

**Response from KBR**

If we take into account where we are, the time period for start up, the prequalification of contractors, getting tenders, tender evaluation, this will take a minimum 5-6 months.

**Response from NWC**

A number of things have caused delays. We were advised by NEPA that an EIA was not needed for Stage 1. Then they said we needed various permits. We stopped the project and started working on this. We will install 30 water meters in different locations to tell us where we are losing water. This will lead into leak detection and major construction. Work should start in November, and major construction in six months. The project is a collaboration between NWC, the Government, and the European Investment Bank. Before the Bank gives any money, the Government has to make a commitment. The Government has provided funding so far and the Bank is now ready to begin funding. We spoke to them last Thursday and they are satisfied with the commitment from the Government. The NWC is providing Chinese pipes. We are satisfied the funds are there to carry the project through. February to March will be the start.

**3.9. From Mr. Holgate**

*The problem is water. We have laid pipes all over. Even after the rains there is no water. Where is the water coming from? The storage capacity is only 9 million gallons.*

**Intervention by the Moderator**

This will be in Stage 2

*Five years ago pipes were laid in Fairy Hill*

**Response from NWC**

Those pipes were laid to the east. We are putting in something to support these pipes.

*Will they be in Stage 2?*

**Response from NWC**

They will be installed but will not be high pressure.

*My hotel is 450 feet above sea level. I have to be pumping water.*



**Response from NWC**

The problem is there is not enough water in the system. In Stage 2 the full service will come into effect. There is a leakage repair component to this. That 70% will be cut down to 50% or below. Increase will be seen in water supply.

*In San San everyone pumps water. After the high pressure installation do you think we will get water at 450 feet?*

**Response from NWC**

The source from Grants Level deals with this. There is sufficient water we will put in the system. The water feeds into the reservoir at West Retreat. If it is higher than West Retreat we will need booster pump to get it up the hill. You are above our level. West Retreat is 125m or 375 to 400 feet. You are at border line you might still have to pump.

*We have several communities above this level. Stony Hill can accommodate pumping for Rio Grande.*

**Response from NWC**

That's a different project.

**3.10. From an Unidentified Questioner**

*Will you work at nights?*

**Response from NWC**

We are not considering it.

**3.11. From the Portland Environmental Protection Association**

*Removal of mangrove in the Annotto River is not a good idea as this is the only mangrove site in Port Antonio. The funds that are allocated would be better spent on more sustainable measures.*

**Response from KBR**

Catchment management is a better way to deal with the problem. A lot has happened in the catchment in the short to medium term.

I do not have the figures, but the amount of money it takes to clear the river is less than any alternative measure, which are very long term or very expensive. We are cutting a new channel through the mangrove, not clearing them.

*The mangrove is acting as a filter for garbage. Visible solid waste is seen in the harbour. Do a little more investigation.*

**Response from KBR**

The cost does not justify further investigation. We are not removing the mangroves. We are cutting them back. We are reinstating channels, trimming them back. The problem of solid waste disposal, another organization or NGO will address.

**Comment from NEPA**

Jamaica is bound to certain conventions on how we relate to certain habitats under the Ramsar Convention. Jamaica is guided in terms of how we treat wetlands and mangroves. If certain areas are cut back, others have to be planted in suitable locations. You will not lose out on mangroves.

**Response from KBR**

We will not stop the ecosystem from functioning. We could propose replanting of mangroves. It is not always successful. A scheme could be devised where mangroves are replanted.

**3.12. From the Port Authority**

*I am concerned about Stage 1 without Stage 2. We do not want a situation where Stage 1 ends, and Stage 2 is years down the road. We need a timetable. We need a starting date. We need to know when it will finish.*

**Response from NWC**

That has to be a question for NWC. Originally, the project was divided because Stage 1 was acceptable without an EIA whereas Stage 2 needed an EIA. Then both stages needed one. We have in our books, on record, a design for the full project. There are concerns about the sewage treatment that we need to investigate further. We are not forgetting sewage treatment. If we proceed as we have, we are not going to delay Stage 1. It can run independently of Stage 2. Those concerns will be addressed and are still under review. As soon as we have come up with a satisfactory plan we will let people know the proposals for the water treatment plant at Grants Level. We do not want to make the same mistake as in Negril in terms of soil condition.

The project is a 38 month design to completion. We have allowed 1 year for design, which is almost complete. We are doing reviews. We are 2 months behind but we still intend to deliver in 38 months, which would be the middle of 2009

*What about the scope of the project?*

**Response from NWC**

We are advising the Parish Council in meetings of the Portland Development Committee. We were made aware of plans and made provisions.

*Sewage and water for Titchfield and Navy Island? We need one-to-one discussions with your team.*

**Response from KBR**

As far as we are aware, we have taken the plans for Titchfield and Navy Island into account but are happy to meet with the Port Authority to discuss specifics.

**3.13. From Silvia McCarthy**

*The quality of water we are consuming is not safe. What is being done to improve water quality? Months ago I asked the Health Department to check on water quality at my school. I have not had a report. It is very frightening with so many children drinking water. How many persons are purifying water? I am concerned about health of children.*

**Response from Mr. Panton, Public Health Inspector**

Water samples collected and sent to the lab showed that water quality is acceptable.

**Response from KBR**

I have to say I am very surprised of that question. Every time I have been to Port Antonio I drink the tap water and I have never had a problem. Water is chlorinated to stop any bacteria that might come into it. In institutions it is the problem with storage rather than the municipal water itself.

**Response from Mr. Panton**

There isn't the possibility of quality being compromised. There is enough chlorine even when there is infiltration. This chlorine kills bacteria. Everyday we take samples and test the water.

**3.14. From an Unidentified Questioner**

*There is little or no reference to the development of Portland. Is this project related to the development of Portland?*

**Response from NWC**

This project is part of a Master Plan for Portland. Others will come after it. This is a part of the Master Plan developed by the UDC in 1996.

*The committee is aware that there are planned developments for Portland. I haven't seen anyone from the parish council. They coordinate all developments. Were these plans taken into account? Is this the catalyst?*

**Response from NWC**

As I said, we are part of the plan. It is moving ahead. We are the catalyst. We are a part of the Portland Development Committee chaired by the office of the Prime Minister, and the Parish council.

**3.15. From Dexter Rowland**

*My concern is the dislocation of traffic when the project starts. The streets are narrow. I think we should not wait until a contractor is appointed. You should get the Chairman of traffic to look at alternate routes that bypass the town.*

**Response from KBR**

It is a concern. It is always difficult to install pipes and cables in urban areas. There is the potential for a lot of congestion. The traffic management plan will try to reduce this to a minimum. There will be additional congestion, this will be inevitable. We will have to put up with this in return for a permanent water supply system.

**3.16. From Colin Bell**

*I have a question to the Port Authority: Will the road through the marina be available for traffic?*

**Response from the Port Authority**

That road is an integral part of the development. It is not designed for that type of traffic.

*I can understand that on a day when there is a cruise ship it cannot be available.*

**Response from the Port Authority**

It is a question of design.

*Even though it is our money?*

**Response from the Port Authority**

Even if a request is made, it has to be assessed. It will affect a lot of things, it cannot be considered.

Management plans are required to be made. The consultant should start to prioritize that in recruitment of contractors. Contractors should be involved. I cannot say whether the authority reserves the right.

**Response from KBR**

We do have a lot of mitigation issues. We said what we expected to see and have actually started working on the plan. We cannot dictate in what order the contractor will work. When he has a work plan we will look and see how he will manage the traffic to complete the work plan. The contractor will turn it into a full traffic management plan.

**Written Comments and Questions****3.17. From Vivienne McLean**

*Presenters were professional - knew their craft and could explain in lay-man's terms their projections. However, I do hope this is not just another project that falls by the wayside. The*

*plan seems OK and we hope this is seen through to fruition for the betterment of the people of Port Antonio and people of Portland at large and eventually the whole island.*

**Response from KBR**

We are pleased Ms. McLean appears to have enjoyed the presentation. NWC and their consultants also hope to see the project through to fruition.

**3.18. From Dorothy Whyte**

*The presentations were helpful in most areas. However, I am concerned about the repairs to the roads after the drains are dug. If there is no ongoing collaboration with NWA there will be major problems. NWC has a reputation of digging but not repairing. Hopefully this will not be repeated in Port Antonio.*

**Response from KBR**

We appreciate Ms. Whyte's concerns about road reinstatement. The PAWSDP contractor will be responsible for backfilling pipeline trenches in accordance with internationally-accepted 'good practice', including resurfacing the area excavated. However, where the road was previously in bad condition, the overall surface quality may not be significantly improved, although it will certainly be no worse. We have suggested that on completion of the Stage 1 works NWA should arrange for resurfacing the full width of those roads along which work has been undertaken.

**3.19. From Winston Boothe**

*The Port Authority of Jamaica (PAJ) has a major development plan for the town of Port Antonio. The PAWSDP will therefore have major implications for the planning of our development. Here is therefore a need for consultation and coordination with the management of the Port Authority.*

*What is the construction timetable for the project, i.e. project start and completion?*

*Has the PAJ project been taken into account in the design forecast?*

**Response from KBR**

As given in response to a previous oral question, NWC have stated that construction work on Stage 1 could start in 6 months. The construction period for Stage 1 is expected to be 18 months.

A meeting between the KBR Design Team, NWC and Stephen Miller of PAJ was held in Kingston on 15th June 2005. The PAJ projects will benefit from the PAWSDP works. The details of these benefits are given in the response below.

### 3.20. From Robert Stephens

*Concerns re: scope of work:*

- *Stage 1 sewage can't work independent of Stage 2;*
- *Water and sewage does not seem to include provisions for the development of Navy Island, Titchfield Hill Hotel and Heritage Village, and expansion of the Marina.*

#### **Response by KBR**

Stage 1 provides for the collection of sewage flows while Stage 2 caters for its delivery to a treatment plant and safe disposal. Clearly the two project stages cannot work independently. PAJ's proposals for the expansion of the west harbour are not clearly defined, nonetheless a significant amount of water is allowed in the project for the marina which ties in with the request from early meetings with the PAJ. For Titchfield Hill Hotel and the Heritage Village resources to satisfy likely demand have been included in the assessment of water requirements. For sewerage, the network is sized to take the PAJ discharges but the Authority will need to connect to the trunk sewer in either George Street or Foreshore Road. Sewer lines into the Titchfield area are not being included in the Stage 1 works. The likely water resource necessary for Navy Island has been included in the Stage 1 calculations but a new connection across to the island will not be constructed under the scheme. There was no sewage allowance for Navy Island as it was expected at the time of discussions with PAJ that sewage treatment would be provided locally.

### 3.21. From Margorie Moyston

*If there are breaches of the EMP (Environmental Management Plan) by the Contractor/NWC perceived by the community are there any structures in place for the community to have their concerns aired and dealt with?'*

*Is there any proposed mechanism in place to keep the public abreast of the progress/problems on the project?*

#### **Response from KBR**

There are a number of formal and informal mechanisms in place for the public to air their concerns about perceived breaches of the EMP and to be kept abreast of the progress/problems of the project. Primarily, there will be a formal procedure for documenting complaints, ensuring they are raised with the consultant and contractor, and appropriately dealt with. The Environmental Monitoring Plan includes provision for monitoring, for example, of air quality and noise, in response to complaints received. Notices in Port Antonio Library, Portland Parish Council offices and other locations will give 24-hour telephone numbers for the reporting of complaints.

A project Advisory and Monitoring Committee (AMC) has been established for some 2 years and has been kept abreast of design. Meetings, usually quarterly, will continue to be

held throughout the period of construction to disseminate information on progress and problems among the major community stakeholders.

The construction contract includes the provision of penalties, including fines, that NWC can levy upon the contractor should he repeatedly breach the requirements of the EMP. Less formally, the PAWSDP will attain a high profile in the town and the local Press and TV will certainly be reporting on the work as it proceeds.

### 3.22. From Wendy Forbes

*Since congestion is going to be a major problem are there going to be works carried out at night? I think this could reduce congestion drastically.*

#### **Response from KBR**

In accordance with international norms the PAWSDP sets limits on the hours the contractor may work at night, over weekends and on public holidays. Extended working hours are normally only permitted where a significant advantage to progress may accrue or where additional work is necessary to maintain public or worker's safety. For example, it would be normal for the contractor to complete pipeline road crossings, often a very disruptive operation, during two consecutive nights with no work during the intervening day.

Notwithstanding this, Ms. Forbes raises an issue that echoes discussions held with the PPC and others. Since Port Antonio town centre is substantially non-residential, extended working hours may not be such a problem as they are elsewhere. The Construction Manager will therefore have greater flexibility to permit extended hours where the contractor requests. However, the vast majority of pipe laying will still be undertaken during the day as night-only working would unacceptably extend the period of construction, and the period the community suffers disruption. More importantly, well documented Health and Safety at Work statistics show there is increased risk to worker's safety during the hours of darkness whatever level of site illumination, itself disruptive to adjacent residents, is provided.

### 3.23. From Noel Downer

*Presentation very general for those that know about water and sewer systems.*

- 1. Sewage system. Trunk lines. Requirements for manholes and vents to prevent the build up of gases.*
- 2. Pumping station. Will there be stand-by power?*
- 3. Will the treatment be at a lagoon or will we have secondary treatment of effluent?*
- 4. Laterals - Will there be a manhole at the property line with interceptor included? Note: Gases may enter several buildings which do not have proper trap seal and venting.*
- 5. Will there be inspection by qualified people?*
- 6. Will the sewer and water be installed in the same trench? So at what elevation will be the sewer and the water main?*
- 7. How do you guard against cross-connection?*

8. *Water - What is the maximum static pressure proposed? Note: Excess pressure can have a negative effect on HWT faucets (taps) and burst pressure on distribution pipes.*

9. *To safeguard against low pressure, why not have storage tanks that provide gravity feed?*

**Response from KBR**

We are sorry Mr. Downer found the presentation rather general but we were required under NEPA guidelines to make public meetings comprehensible to non-specialists.

1. The maximum distance between manholes will be 90 m. In most cases they will be considerably closer, at each change of direction etc. A separate exercise to investigate the potential for the generation of gases such as H<sub>2</sub>S was undertaken during design and found it not to be a problem.

2. No pumping stations will be constructed under PAWSDP Stage 1. Those built under Stage 2 will have 100% stand-by capacity, including stand-by power.

3. The treatment process to be adopted for Stage 2 construction remains under review.

4. The Stage 1 works will end with laterals at property boundaries. To connect onto the scheme individual householders will be responsible for constructing a manhole and connecting their household pipework.

5. International consultants KBR have been appointed as the Construction Manager and the KBR team will include qualified and experienced engineers and site inspectors.

6. Sewers and water pipes will be laid in the same trench, the sewer line generally at a lower level than the water pipe. The elevation of the sewer lines is dictated by the need to maintain gravity drainage and adequate pipeline gradient to achieve self-cleansing velocities. The minimum cover of sewers will be 1.2 m for sewers and 0.6 m for water pipes.

7. The water and sewage pipes will be vertically and horizontally separated; minimum 1.5 m horizontally, 1.0 m vertically. If for hydraulic reasons this spacing cannot be met the water pipe will be encased in concrete.

8. The maximum target water pressure for pipework in the town will be 3 bar (50 psi) at normal temperatures with pressure reducing valves provided for pressure management. High pressure mains transiting through town and feeding areas east (under Stage 2) and west will have a static pressure of approximately 10 bar.

9. The use of storage tanks to protect against low pressure is not an issue for Port Antonio if fed from West Retreat Reservoir. The provision of household tanks is the householder's responsibility.

**3.24. From Pauline Peters**

*My main problem is we can't get water most of the time at John's Town Road and even further up. As a matter of fact in the whole of John's Town there is no water in some people's pipes, none at all. The Water just come and have a good look at the road. We have no road at all. It's a shame to see the road. Man, it is more than bad. That is the two main problems; road and pipe trouble.*



**Response from KBR**

The new high pressure main feeding the area east of Port Antonio will pass along the bottom of John's Town Road and will increase water pressure and hence resource availability in the area. However, the benefits of this will not be obvious until implementation of the Stage 2 works.

**3.25. From Alec Dohaney**

*Can you confirm that the repaired road surface will not add to the existing road problems? Please return all surfaces to their normal state - not mounds of earth and rocks.*

**Response from KBR**

Again we appreciate the wide concern about road reinstatement. The PAWSDP contractor will be responsible for backfilling pipeline trenches in accordance with internationally-accepted 'good practice', including resurfacing the area excavated. However, where the road was previously in bad condition, the overall surface quality may not be significantly improved, although it will certainly be no worse. We have suggested that on completion of the Stage 1 works NWA should arrange for resurfacing the full width of those roads along which work has been undertaken.

**3.26. From Sylvia McKenzie**

*70% of water in Port Antonio is lost because of leaking pipes. The quality of the water we are consuming is poor. We are experiencing more water lock offs as a result of this. I would like to know what the NWC is doing about this serious problem.*

**Response from KBR**

The reduction in leakage from water pipes is one of the main objectives of the PAWSDP. A metering contract to monitor flows and identify the locations of leaks is expected to be let by NWC in the near future. As leakage is reduced through the repair and replacement of pipes under the Stage 1 works, additional quantities of water will be delivered to consumers' taps. Notwithstanding this, the benefit of additional water will not be fully appreciated until additional water resources to satisfy demand up to 2025 from the Grant's Level wellfield at Berrifield are developed during the Stage 2 works.

Although the water currently put into supply is generally of acceptable quality and is chlorinated at source to maintain this through to consumers' taps, the Stage 2 works will include new disinfection facilities and water quality control measures to ensure quality is maintained throughout the life of the completed installations.

**3.27. From Machel Donegan, PEPA**

*Please find attached the comments from PEPA, JET and ELAW: (Reproduced below)*

*Flood control in the Annotto River is necessary and a long-term problem requiring a watershed-wide approach to be effective. The main problem in the watershed is the high amount of fine sediment entering the stream from upland areas and bank encroachment in the lower reach. The flood mitigation plan addresses neither. Removing mangroves, essentially the only current functioning part of this watershed, further adds to sedimentation in the lower reach, nutrient overloading in the bay, and greater infill requiring more frequent dredging. That mangrove site is the only mangrove site in Port Antonio and is used for schools as a teaching resource. We recommend that a number of alternative interventions take place in Annotto River including bank stabilisation, erosion control, reopening backwater channels, and even reclaiming former mangrove areas.*

*As the EIA acknowledges, the most contentious issues are related to the removal of a portion of mangroves and silt accumulated in the Annotto River between West Street and Port Antonio Marina. The EIA states the removal of c.3,500 m<sup>2</sup> of mangrove and 2,000 m<sup>3</sup> of silt would be necessary because parts of the town are below sea level and prone to flooding due to inadequacy of the drainage system. Apparently, hydraulic modelling has shown this to be a major constraint to the passage of flood flows, and a major cause of flooding.*

*Despite the relevance of the potential environmental impacts of the mangrove removal, the analysis of alternatives for the removal of mangroves in the Annotto River lacks sufficient technical analysis. Section 9.15 and 9.16 discuss some mitigation measures, and alternatives such as compensatory planting of mangrove at Turtle Crawle and/or an alternative site to prevent a reduction in the overall mangrove coverage in the Port Antonio area, and construction of overflow, diversion pipelines and alternative routes.*

*We suggest requesting more extensive assessment of alternatives and the cost analysis of the Annotto River drainage options. In addition we are sceptical of the mangrove replanting, as while this has been required under many other permits, there has been no analysis of the success of this mitigation measure. It is quite likely that the mangroves will be removed but never replanted.*

*Other weaknesses of the EIA are:*

*Lacks information of all temporary drainage discharge points during construction.*

*Needs a more comprehensive waste management plan, for instance the EIA should contain more detailed information about:*

- Management and final disposal of unwanted spoil and aggregate materials;*
- Sewage from the construction camps (Section 6.19);*
- Waste oil, grease, used tyres, and fluids of heavy equipment and construction machinery.*

#### **Response from KBR**

PEPA raises important issues but overall we are pleased their foreign advisers, whose comments are understandably somewhat academic since they do not know the particular situation in Port Antonio, find so few areas of concern in the Stage 1 EIA.

Flood alleviation from the Annotto River was always considered to be the most contentious issue of the Stage 1 proposals, and so it has transpired. As PEPA state, *the main problem in the watershed is the high amount of fine sediment entering the stream from upland areas* (primarily due to the clearance of forest for agriculture) *and bank encroachment in the lower reach* (due to habitation and other development). The sustainable solution to these problems is to return agricultural land to forest and to reinstate the natural catchment to be devoid, or almost so, of development. As PEPA also state, *the flood mitigation plan addresses neither*. Neither of these options is feasible and would only offer long-term solutions to the ongoing problems of flooding, and the associated disruption, risk to health and financial loss regularly suffered by the victims. Whilst the alternatives proposed by PEPA would, if achievable to the extent necessary, offer some long-term protection, they do nothing to address the present problems. Their objection to the Stage 1 proposals only commits flood victims to repeated suffering for the foreseeable future. Responsibility for 'catchment management' solutions is rather poorly defined in Jamaica and we doubt the availability of political will to tackle the problems in the way they propose.

However, we fully accept that the solutions PEPA suggest are, at least in theory, 'sustainable' whereas the Stage 1 proposals are 'non-sustainable' in the sense that silt will continue to accumulate and the mangroves will grow back, necessitating repeated clearance and cutting at intervals in the future.

We therefore suggest the Stage 1 proposals be approved in order to provide short and medium-term relief of human misery, but that PEPA continue to pursue their longer term alternatives with those responsible, which do not include the PAWSDP Proponent. Should they be successful, they could at some future date request NWA to cease cutting the encroaching mangroves and allow them to grow back.

Continuing to respond to PEPA's comments, alternatives such as diversion pipelines and culverts have received little technical analysis. They have certainly been considered but because of the technical difficulties they pose and their excessive cost, it has not been possible to justify fuller analysis.

We understand PEPA's scepticism regarding compensatory planting. Certainly this has been required under previous permits but never undertaken. But also certainly, there are projects on which mangrove replanting has been successful. As to whether this will be done on PAWSDP we would ask PEPA to give NWC the benefit of doubt on the basis that with an international Construction Manager and perhaps an international contractor, the conditions and requirements of the contract, including compliance with the Environmental Management Plan, will be honoured and mangrove replanting will be achieved. PEPA suggestions as to where this replanting will be most beneficial will be welcomed. The 3,500 m<sup>2</sup> to be cleared, as given in the EIA, is a maximum figure and recent site inspections suggest it may be substantially less than this.

In respect of PEPA's perceived *other weaknesses of the EIA*, these are either specifically or inherently criticism of the policy to be implemented and outside the scope of engineering design. The details regarding temporary drainage discharge points and waste management plan necessarily await proposals from the contractor, all of which will be approved by NWC,

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the Construction Manager and others, e.g. NEPA, NWA, NSWMA, before work on site commences.

## 4. CONCERNS AND COMMENTS FROM NEPA

- 4.1. The written comments of NEPA took time to collate and were only received on 7th February 2007 under letter reference 03EA25002.39/349. A copy of these comments is given in Appendix G and responses presented below.

### General Comment

- 4.2. The Environmental Impact Assessment (EIA) Report outlines a fairly comprehensive study of the proposed project.

#### Response from KBR

We thank NEPA for their comments and are pleased they found the EIA comprehensive.

### Sewage Conveyance

- 4.3. Lift stations should be equipped with standby power generation equipment and standby pumps. The location and construction of any lift station should be approved by the Local Planning Authority.

#### Response from KBR

This comment relates to Stage 2 of the project which is the subject of another EIA study. There are no pumping stations on Stage 1. Notwithstanding this, all sewage pumping stations will be equipped with 100% standby capability for both pumps and power generation.

### Flooding and Drainage

- 4.4. A comprehensive Surface Drainage/Storm Water Plan should be developed for the review and approval of the National Works Agency (NWA).

#### Response from KBR

Comprehensive detailed design plans and specifications of the proposed drainage works have been prepared based on design reports previously submitted to the NWA. These detailed plans will be submitted, in support of previously submitted documents, to NWA

prior to project implementation. A formal Drainage Plan for construction will be presented and approved by NWC, NWA and the Construction Manager, via the Project Implementation Unit (PIU), within which NWA are represented, before work on site is allowed to commence.

*It is recommended that a detailed Flood Impact Assessment of the Turtle Crawle River be conducted and presented to the Water Resources Authority and the National Works Agency for review and comment. This assessment should include the evaluation of the impact of flood levels associated with normal and extreme rainfall events on aspects of the proposed project.*

**Response from KBR**

Construction in the vicinity of Turtle Crawle River is not included in the proposed PAWSDP Stage 1 works, but in Stage 2 works, which is subject to a separate EIA, in which the impact on flood recurrence intervals in Turtle Crawle valley will be assessed and discussed.

## Water Supply

- 4.5. *There is a proposal to increase abstraction from the Grants Level wellfield, however investigations to confirm the availability of the additional water are to be done.*

**Response from KBR**

Additional resources development to increase water supply to Port Antonio are not included in the PAWSDP Stage 1 works but in Stage 2, and will be fully discussed in the Stage 2 EIA.

Notwithstanding this, a separate report covering this issues; *Port Antonio Water, Sewerage and Drainage Project: Grant's Level Aquifer Production Study* (KBR Ref: XU0396/100/W/0002), completed in February 2006, shows the additional resources to be available, subject to confirmatory test pumping following well construction.

## Groundwater and Springs

- 4.6. Again, this is an issue specific to Stage 2 of the project rather than Stage 1. Nevertheless, provisional responses are given to the NEPA comments below, pending their full discussion in the Stage 2 EIA, which is subject to review.

*Is it normal to use the annual minimum 30-day discharge as a flow index for assessing the sufficiency of domestic surface water supplies? In allocating surface water resources the WRA has been using the  $Q_{90}$  (or flow that is equalled or exceeded 90% of the time as determined from a flow duration analysis) as the reliable yield of the river. This flow, less*

*the 7Q<sub>10</sub> (annual minimum 30-day discharge from a 1 in 10 year return period) was the basis for allocation.*

*The Water Resources Development Master Plan (WRDMP) now under revision has suggested the continued use of the Q<sub>90</sub> for reliable surface flow determination. The reference in this section to an “annual minimum 30-day discharge from a 1 in 10 year flood event” suggests some misunderstanding of the low flow probability concept.*

**Response from KBR**

Reference to “flood event” is misplaced and has been used in error. The sufficiency of surface water sources for domestic supplies from the Rio Grande has been determined and shown to be adequate to meet increased production needs by assessing the annual minimum daily discharge for a 10-year return period (which is equivalent to the daily flow that is equalled or exceeded 90% of the time). This is more exacting than the annual minimum 30-day discharge from a 1 in 10 year return period and it can therefore be concluded that supplies are sufficient to meet increased production requirements.

*The reason given for using Rio Grande at Alligator Church data instead of Fellowship data to determine statistically the reliable yield of the river at Fellowship has no merit. Any dependence, randomness, trends, etc observed in time series should be similar for the next, as we are talking about 2 stations on the same river.*

**Response from KBR**

Although it would have been preferable to use data from Fellowship this was shown to have inconsistencies that may have compromised the quality of the data, and hence the analysis. Since Fellowship and Alligator Church are 2 stations on the same river and the data at Alligator Church withstands statistical acceptance for dependence, randomness, trends etc then it is prudent to only use Alligator Church data for frequency analysis.

*The environmental flow that is proposed in the WRA revised 2<sup>nd</sup> draft of the Water Resource Master Plan is 60% of the 7Q<sub>10</sub> (annual 7-day minimum mean flow with a 10 year return period) and not 40% of the annual minimum daily discharge with a 10-year return period as stated. The 7Q<sub>10</sub> for the Rio Grande at fellowship is 1.81m<sup>3</sup>/s hence the environmental flow would be 1.1m<sup>3</sup>/s which in this case would be greater than the residual flow of 0.938m<sup>3</sup>/s projected.*

*NB. The actual flow may have been greater if the Fellowship data and not the data generated using Alligator Church data were used.*

**Response from KBR**

The residual flow in the river after abstraction at Grants Level would be 0.938m<sup>3</sup>/s. If 60% (instead of 40%) of the annual minimum daily discharge for a 10-year return period is the criteria this will equate to 0.81m<sup>3</sup>/s which is still lower than the expected residual flow. The residual flow is therefore acceptable.

It is agreed that if Fellowship data was acceptable it may indicate a slightly different flow than that obtained by correlating Alligator Church with Fellowship data.

## Hydraulic Model of Turtle Crawle

- 4.7. *The report on the hydraulic modelling conducted of the Turtle Crawle area for a 1 in 100 year storm event should be included in the EIA report and submitted to the Water Resources Authority for review.*

### **Response from KBR**

Hydraulic modelling has been undertaken in the vicinity of Turtle Crawle as part of the Stage 2 design studies. The results will therefore be included as appropriate in the Stage 2 EIA.

## Flooding at the Annotto River

- 4.8. *The flood mitigation plan has not addressed the mitigation of the high levels of sediment entering the River. The potential for interventions such as bank stabilization, reopening backwater channels and the reclamation of former mangrove areas may be explored.*

*Every effort should be made to avoid the removal of existing mangroves or ensure the removal of only minimal amounts. The removal of mangroves could add further to sedimentation in the lower reaches of the Annotto River and increased nutrient loading in the bay.*

### **Response of KBR**

We would refer to the comment and response given in 3.27 above on essentially the same topic. The problem to which we have been asked to address is the frequent inundation of properties from flooding of the Annotto River. Having run hydraulic models of river flows to assess the extent of the problem, we have concluded that unless the silting and overgrowth below West Street is cleared to the extent necessary to reopen the natural channel, capacity to cater for flood flows cannot be provided and homes will continue to flood.

Viable alternative solutions centre on the construction of a flood alleviation channel to divert water from the river at the rear of West Street homes to a new outfall in the harbour. Having looked at several potential routes for such a channel, it became obvious that this option necessitated difficult engineering, extensive land-take, and unjustifiably high construction costs.

As previously stated, KBR accept that the trimming back of the existing mangroves and removal of sediment is 'unsustainable' in so much as the exercise will need to be repeated at intervals. While a major cause of flooding might be inappropriate development (urban expansion, clearance for agriculture, backwater infilling, etc) the suggestion that 50-100 years of such activities are going to be alleviated through improved 'catchment management' is unrealistic. While an ideal and wholly honourable aim, the lack of both political will to see reverse development and the clear identification of catchment

management responsibility within Jamaica, will ensure flood victims continue to suffer for years to come.

Notwithstanding this, we wholly endorse NEPA's comment that mangrove removal should be avoided or minimised. We therefore echo an earlier compromise proposal that the present PAWSDP Stage 1 proposal be allowed to proceed to alleviate a serious flood problem, but with approval time limited, perhaps, for example, permitting annual cutting with re-approval every 5 years. If in the interim, catchment management measures that provide adequate flood alleviation can be put in place, NEPA could consider not renewing the mangrove-cutting permit.

In respect of sedimentation, a consequence of poor catchment management, this will be partly alleviated by the PAWSDP proposal, as the finer particles will flow on out to sea beyond the mangroves (as it would have always done naturally), while coarser particles settle out in the areas cleared of earlier sediment, which with increased holding capacity will not increase the risk of flooding.

While sediment going into the bay raises nutrient loading, this is because the sediment is charged with sewage effluent, farmyard runoff, etc. It is well documented that the currently high nutrient content in the bay is the result of uncontrolled sewage discharge to drainage channels and septic tank seepage, i.e. the lack of an integrated sewerage system; the alleviation of which is one of NWC's overall objectives in promoting the PAWSDP proposals.

## 5. DISCUSSION

### General

- 5.1. Both the PAWSDP Stage 1 EIA and the public presentation appear to have been well received and elicited a number of interesting comments. Most people appear to accept there will be additional noise, dust and disruption to traffic during construction but, assuming adequate impact management can be provided, still seem to wish the scheme proceed sooner rather than later.
- 5.2. Leaving aside those comments relating to PAWSDP Stage 2, the proposals for which are currently under review and will be subject to a separate EIA and public presentation, the Stage 1 comments centre on the following issues:



| Engineering Design              | Implementation           |
|---------------------------------|--------------------------|
| Drainage                        | Delays in Implementation |
| Sewerage                        | Traffic Congestion       |
| Water Distribution              | Night Working            |
| Annotto River Flood Alleviation | Breaches of the EMP      |
|                                 | Restoration              |

## Drainage

- 5.3. Residents have been eager to relate problems of flooding at locations beyond the present project area. Once the present proposals have been successfully implemented, NWC may then consider options for subsequent projects.
- 5.4. Despite NWC's and KBR's best efforts at ensuring all drainage proposals are prepared in accordance with NWA requirements, there appears to have been a lack in communications between NWA in Kingston and their local offices in Port Antonio.
- 5.5. Detailed design drawings will be submitted to NWA prior to implementation based preliminary designs previously reviewed. Temporary drainage diversions and over-pumping, during the period of construction, to permit work to be undertaken on existing channels, will be covered by the Contractor's Drainage Plan, approved by NWC, NWA and the Construction Manager prior to the commencement of work via the PIU. The primary mitigation measures are listed in table 10.2 of the Stage 1 EIA under *Drainage, Erosion, Turbidity and Sediment Load*, and discussed in Sections 10.20 - 10.23.

## Sewerage

- 5.6. While KBR allayed concerns that PAWSDP proposals may not provide capacity for planned future projects, opportunities for extending the area covered by the initial sewage collection network have been highlighted in the comments received.
- 5.7. Concerns that the sewerage and other systems may not have been designed in accordance with internationally-accepted standards were also allayed. That the Stage 1 collector sewers cannot be connected to houses and made operational until the completion of the Stage 2 trunk delivery mains, lift stations and treatment plant perhaps came as a surprise to some but was generally accepted. Community pressure groups and local pressure groups will no doubt press for NWC to be given the resources to enable the Stage 2 works to be completed in a timely manner.

## **Water Distribution**

- 5.8. The provision of water supply pipelines under PAWSDP Stage 1 also has limited scope and leaves substantial opportunity for future expansion beyond the main urban area. Again, the Stage 1 and Stage 2 works are inexorably linked; with the new pipelines laid under Stage 1 giving only limited improvements in service through reduced leakage until additional resources and increased pressure are introduced under Stage 2.
- 5.9. While the quality of water delivered to consumers' taps is apparently a cause for concern, fears appear largely unfounded since the supply is both chlorinated prior to distribution and tested by NWC each day. Under Stage 2, new chlorination facilities will be up-rated to cater for the increase in water pumped to distribution.
- 5.10. The problems raised with water quality at particular establishments are likely to result from poor storage tanks. Although beyond the scope of the PAWSDP works, NWC, given the necessary resources, might ask the contractor to check individual building storage prior to completing connection to the new network.

## **Annotto River Flood Alleviation**

- 5.11. As had been expected prior to Public Presentation, the trimming of the Annotto River mangroves between West Street and the Marina proved to be the most controversial of the PAWSDP Stage 1 proposals. While improved catchment management over the last 50-100 years may have prevented the recurrent flooding of homes, any measures introduced now will at best provide long-term benefit and have almost no impact on flooding in the short-medium term.
- 5.12. NWC remains eager to alleviate the suffering of residents as soon as possible and has suggested herein that the Stage 1 proposals be allowed to stand, with the provision that NEPA approval for this aspect of their work be time-limited, the permit to be valid until improved catchment management has been shown to be effective in reducing the risk of flooding.

## **Implementation Programme and Coordination**

- 5.13. Several comments, oral and written, raised the issue of coordination between implementation of PAWSDP and other projects such as the North Coast highway, the Portland Development Plan, and the potential for delay or postponement of Stage 2

construction. The present proposals are beyond the eastern extremity of the North Coast Highway, and are an integral part of the Portland Development Plan.

5.14. Both PAWSDP Stage 1 and Stage 2 works have been designed. In addition to technical problems with Stage 2, NEPA's environmental assessment procedures have, as they are intended to, identified a number of potential concerns in respect of sewage treatment and disposal. A more acceptable solution has been proposed and is currently subject to detailed design and further environmental assessment prior to formal submission.

5.15. This and other issues have led to delays in PASWD implementation, but with completion of the Public Presentation, tender documents for construction can be finalised and tenders for the Stage 1 works sought from contractors.

### **Traffic Congestion**

5.16. All construction projects within urban areas result in increased traffic congestion. In Port Antonio, which already suffers severe congestion, the impact will be substantial. However, most residents seem willing to some additional nuisance in return for the benefits afforded by PAWSDP.

5.17. Measures to ease congestion will be implemented and the contractor will submit a Traffic Management Plan for approval by NWC, PPC, Jamaican Constabulary and the Construction Manager prior to commencement of work. Mitigation measures will include that trench excavation must be quickly followed by pipe-laying, backfilling and temporary reinstatement, with long lengths of open trench not being left for significant periods of time.

5.18. Section 10.6, 10.11, 10.14 and Table 10.2 of the Stage 1 EIA provide more details of traffic management. The resistance of the Port Authority to use the inner marina road as a temporary diversion will only exacerbate the situation and needs to be resolved.

### **Night Working**

5.19. Perhaps surprisingly, there appears to be little resistance to night working within the urban area because much of it is non-residential. However, the benefits of night working to the contractor and the project, in terms of enhanced progress, are limited. Night shifts always achieve less progress and result in more accidents than day shifts. Nevertheless, the contractor and Construction manager will consider night working where it significantly reduces impact and/or the overall time frame for completion.

### **Breaches of the EMP**

5.20. Concerns about the EMP are already addressed by the provisions for construction management and the ongoing involvement of the public through the AMC and the complaints procedure.

5.21. Section 11.11, 11.18 and Table 11.3 give more details of the ways in which breaches of the EIA and the measures for complaints will be handled.

## Restoration

5.22. NWC are responsible for reinstatement and their contractor will accordingly resurface the proportion of roads he excavates. However, given the already poor state of many roads, conditions may not significantly improve on completion of the PAWSD Stage 1 works. It is therefore recommended NWA be asked to undertake a major resurfacing contract throughout all the roads affected by the project.

## 6. PROPOSED AMENDMENTS TO THE EIA

6.1. On the basis of the concerns expressed at the Public Presentation, orally and in writing, together with the written comments submitted through and by NEPA, no significant amendment to the PAWSDP Stage 1 EIA submitted in April 2006 is justified.

6.2. The two issues of most concern and highlighted through the public consultation exercise were construction management and Annotto River flood alleviation. It is therefore prudent in this, the last section of the EIA, to re-emphasise and perhaps strengthen the circumstances that will surround their implementation.

6.3. Construction management, including environmental monitoring and EMP implementation, was a concern of many at the presentation, even though discussed in some detail in the EIA, particularly:

- Construction Management: Sections 10.5-10.47, with sample impact mitigation contract clauses in Appendix B;
- Environmental monitoring: Sections 11.6-11.11 and Table 11.3; and,
- EMP implementation: Section 12.3-12.9.

6.4. Although various Management Plans are referred to, it is now recognised that the absence of a specific listing of these is, with hindsight, a weakness. These Plans, to be prepared by the Contractor and approved by NWC, the Construction Manager and other authorities, such as NWA, as appropriate, will include the following:

- Traffic Management Plan, to minimise congestion and disruption;
- Drainage Management Plan, to ensure construction neither disrupts normal flow or increases sediment discharged to the bay;
- Solid Waste Management Plan, to ensure waste materials are disposed of in accordance with NSWMA requirements;
- Water Supply Management Plan, to ensure supplies to consumers suffer minimal disruption during the laying of new distribution pipes;
- Construction Camp Management Plan, to ensure all aspects of any camp facilities, e.g. vehicular access, fuel storage, sewage disposal, stack emissions, etc., conform to 'good practice' or NEPA Environmental Quality Standards; and,
- Health and Safety Management Plan; detailing the measures to be taken to ensure workers and public safety, and the emergency procedures to be followed in case of accident.

6.5. In addition, the Contractor will of course be subject to the Environmental Management Plan that comprises Sections 10, 11 and 12 of the EIA.

6.6. In respect of flood alleviation in the Annotto River, predominantly the concern of one particular respondent, the choice is essentially between channel clearance, including trimming back the existing mangroves, which is seen by the Project Proponent and the Design Consultant as the only viable solution to the recurrent flooding of homes, and improved catchment management, a longer term solution, acceptably more sustainable, but considered to be almost infeasible in the present economic and political climate.

6.7. In order to resolve the apparent impasse, it is now suggested that the present PAWSDP proposal be allowed to stand but be time limited, thereby giving NEPA the opportunity to prevent further mangrove trimming beyond such time as catchment management measures can be shown to have adequately alleviated the risk of further flooding.

**APPENDIX A**  
**Copy of Public Notice and List of Posting Localities**

**ATTENTION ALL**  
**PORT ANTONIO RESIDENTS**

**THE NATIONAL WATER COMMISSION  
(NWC)**

**is pleased to announce there will be a**

**PUBLIC PRESENTATION**

**of the**

**ENVIRONMENTAL IMPACT ASSESSMENT  
REPORT**

**for the**

**PORT ANTONIO WATER, SEWAGE AND  
DRAINAGE PROJECT (PAWSDP) Stage 1**

**on**

**TUESDAY, AUGUST 15, 2006 AT 6 P.M.**

**at the**

**PORT ANTONIO COMPREHENSIVE HIGH SCHOOL**



*The public is invited to attend.  
Questions relating to the proposed project will be answered*

**List of Locations where the Public Notice was Posted**

Port Antonio Comprehensive High;  
NWC Commercial offices;  
Scotia Bank;  
National Commercial Bank;  
Port Antonio Public Library;  
Port Antonio Post Office;  
Portland Parish Council offices;  
Central supermarket; and,  
KFC.



**APPENDIX B**  
**List of Recipients of Written Invitations**

Written invitations to the Public presentation were dispatched to the following recipients on Tuesday 8th August, with reminders sent on Thursday 10th August.

Dennis Wright - JLP Caretaker  
Honourable Errol Ennis - Member of Parliament  
Honourable Dr. Donald Rhodd - Member of Parliament  
Errol Panton - Advisory Monitoring Committee (AMC)  
Ms. Samuels - AMC  
M. Donegan - AMC  
Daphne Armstrong - AMC  
Nadine Simpson - Social Development Commission (SDC)  
S. Bailey - AMC  
Ralph Falloon - SDC  
D. Rowland - AMC  
Wayne McKenzie - AMC  
Rose-Marie Morris - AMC  
Vassell Brown - AMC  
Nellie Walker - Portland Development Committee (PDC)  
Gloria Silvera - Caretaker  
Barbara Walker - AMC  
Colin Bell - Master of Ceremonies  
Rhonda Grey - AMC  
Boyd Lewis - Portland Chamber of Commerce (PCC)  
Linnette Patterson - AMC  
Ethlyn Douglas - Portland Parish Council (PPC)  
Bent Kristensen - PCC  
P. Perry - Jamaica Tourist Board  
Rupert Kelly - Mayor of Port Antonio  
Mr. Harris - Principal, Port Antonio Comprehensive High School  
Garth Davis - Gleaner Correspondent  
Marguerite Gauron - RJR Correspondent  
The local cable station  
The Jamaica Information Service

**APPENDIX C**  
**Copy of Press Advertisement**

NATIONAL  
WATER  
COMMISSION

**PUBLIC PRESENTATION**  
of the  
**ENVIRONMENTAL IMPACT  
ASSESSMENT REPORT**  
for the  
**PORT ANTONIO WATER, SEWERAGE  
AND DRAINAGE PROJECT**

On  
**TUESDAY, AUGUST 15, 2006**  
**AT 6 P.M.**  
at the  
**PORT ANTONIO COMPREHENSIVE  
HIGH SCHOOL**

*(not at the Ken Wright Pier as previously advertised)*

*The Public is invited to participate in the presentation by way of asking questions relating to the proposed project.*

*Copies of the Environment Impact Assessment Report are available for consultation:-*

- Via the internet at [www.nepa.gov.jm](http://www.nepa.gov.jm) or [www.nwcjamaica.com.jm](http://www.nwcjamaica.com.jm)*
- At the Portland Parish Library in Port Antonio*
- At the Port Antonio offices of Portland Parish Council*
- At the Port Antonio offices of the National Water Commission, &*
- At the Port Antonio offices of the Portland Environmental Protection Authority (PEPA)*

**APPENDIX D**  
**List of Registered Attendees**

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**List of Registered Attendees**

|                       |  |
|-----------------------|--|
| Derron Wood           | Portland Parish Council                |
| David Lee             | KBR PAWSDP Local Environmentalist      |
| John Maziliauskas     | KBR PAWSDP Project Manager (Speaker)   |
| John Davey            | KBR Environmental Consultant (Speaker) |
| Colin Bell            | Satcom Satellite TV (Moderator)        |
| Randy Maxwell         | NWC PAWSDP project Manager             |
| Bridget Lawrence      | NWC Environmentalist                   |
| L. Don Streete        | NWC                                    |
| Karen Clacken         | NWC                                    |
| Bent Kristensen       | Portland Development Corporation/WBS   |
| Nilka Herron          | Norwich Provident Society and GBS      |
| Nadine Simpson-McLean | Social Development Corporation         |
| Errol Panton          | Portland Health Department             |
| Marcus Barrett        | Resident                               |
| Joseph McCarthy       | NEPA                                   |
| Nellie Walker         | Chairman, Portland Resort Board        |
| Sydney Massod         | Port Antonio Design and Training       |
| Carl xxx              | Jamaica Information Service            |
| Everard Owen          | The Observer                           |
| Noel Downer           | Resident                               |
| Florette Downer       | Resident                               |
| Charles Thomas        | Resident                               |
| Melvin Davis          | Resident                               |
| Canute Thompson       | Resident                               |
| Warren Campbell       | Jamaica Fire Brigade                   |
| xxx Brown             | Resident                               |

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|                   |  |
|-------------------|--|
| Pauline Peters    | Resident                               |
| Vassel Brown      | Portland Chamber of<br>Commerce        |
| Robert xxx        | Portland Chamber of<br>Commerce        |
| Winston R. Palmer | NWA/Sunshine Taxi                      |
| Sean Long         | NWC                                    |
| Kim Chin          | NWC                                    |
| Richard Williams  | NWC                                    |
| Clifton Barrows   | NWC                                    |
| Anthony Carby     | NWC                                    |
| Pat Hendricks     | Resident                               |
| Sylvia McKenzie   | President, Port Antonio Rotary<br>Club |
| Esmine Lawrence   | Port Antonio Rotary Club               |
| Andrea Collins    | R M Court                              |
| Marjorie Moyston  | R M Court                              |
| Eva Slugent       | Resident                               |
| Machel Donegan    | PEPA                                   |
| Winston Boothe    | Port Authority of Jamaica              |
| Robert Stephens   | Port Authority of Jamaica              |
| Wendy Forbes      | MP Constituency office                 |
| Charles Buchanan  | NWC                                    |
| Noel Whyte        | Noel Whyte and<br>Associates/KBR       |
| Boyd Lewis        | Portland Chamber of<br>Commerce        |
| Viola Blake       | PEPA                                   |
| Alec Dehaney      | Portland Chamber of<br>Commerce        |
| Dorothy Whyte     | Cabinet Office                         |
| Vivienne McLean   | Portland Diaspora                      |
| Howard Pinnock    | Norwich Provident Society              |
| Benny White       | Mayor, Port Antonio Parish<br>Council, |
| xxx Rowland       | People's National Party                |
| Donald Rhodd      | MP, East Portland                      |

**APPENDIX E**

**Transcript of the Public presentation Q&A Session**



# PORT ANTONIO WATER SEWAGE AND DRAINAGE PROJECT PROJECT STAGE 1

## ENVIRONMENTAL IMPACT ASSESSMENT

### PUBLIC CONSULTATION 15<sup>th</sup> August 2006 Port Antonio High School

#### Questions and Answers

1. **Colin Bell:** How does the time period, in terms of phase 1, affect the construction of the north coast highway to the town of Port Antonio?

**Response:** With regards to the highway, we are communicating with the relevant authorities. The program for that is independent of the Port Antonio Water Sewerage and Drainage Project. The highway work presently under construction finishes on the west side of Port Antonio, it does not affect the work we have looked at. If everything goes according to plan then the earliest construction will start will be six months for stage 1. We are not sure how construction on the highway ties in with that.

2. **NWA representative:** We are concerned about the drainage plan. The local Portland team needs to be a part of it.

**Response:** The drainage plan is not finalized. When we have the meeting to sign off on the project the local NWA team will be invited.

3. **NWA representative:** With regards to Cane side River, will you do any protective work?

**Response:** There will be a removal of the structure. When this structure is removed we will put in gabions to stabilize the bank. Just to say, we have been we have been talking to NWA and I am surprised to hear that you are not abreast of the plans. You should ask your head office because we have been talking to them. Are you aware that there are plans drawn up through Port Antonio?

4. **Mr. Christensen (Business Operator)** I am concerned about the roads being dug up for long periods of time. There is no alternate route for traffic in regards to the main road leading to the court house. We are asking that the Port Authority make that road which runs alongside the Port Antonio Marina and Yacht Club, to the public park, to the Village of St. George, available for use.

**Response:** You raised a couple of important issues. On the general issue, the contractors will not be allowed to dig large trenches and leave them open for long periods of time. The Contractor will have to come up with a traffic management plan that is acceptable but during work along West Street the use of the Marina road would seem the most obvious alternative route but it is not up to us at this time to determine where the diversions will take place. Port Antonio is congested anyway and the short term congestion will get worse during construction, however, we will do our best to alleviate traffic congestion.

5. **Dr. Donald Rhodd MP:** After desilting and removal of the bridge at Cane side River, will there still be a problem with flooding in areas such as Baforhole, about 400m away. This area has always been flooding and has always been a problem. Have your studies shown that desilting and removal of bridge will alleviate this problem?

**Response:** I understand the concern. We are looking at the area by Cane side River where the bridge is. There are two problems there; the area is low lying and there is a large volume is coming off the mountains to the flat areas. To solve this problem we are intercepting and diverting runoff from the hills which contribute to this area and by virtue of doing this we alleviate a large amount of flooding. Flows will be intercepted by new culverts at Sommerstown Road and conveyed to the sea by a new route. Essentially, the problem with flooding is not just associated with the removal of the bridge and there will be no desilting works in Caneside River.

**6. NWA:** You will be installing culverts. Will they be running through private properties? 25 feet from main road is public property beyond this is private property.

**Response:** All of the culverts will be placed in the road and hence will not be in private property.

**7. Dr Donald Rhodd:** There is a river close to this community, the Barnett River, which causes flooding of the Boundbrook community. The parish council use heavy equipment to desilt the river, but there is still flooding at times.

**Response:** We will follow the master plan. Anything outside this boundary is not a part of this project. [Rhodd] The river is after the gas station. **Response:** It is therefore outside the project boundaries. We are happy to include any extra work but this will be up to the NWC if they wish us to undertake it.

**8. Dr. Donald Rhodd:** There is a projected expansion of the town. There are a number of housing projects planned, schools etc. How has this been included into the project?

**Response:** That comes into Stage 2, we are not discussing in detail here tonight, however, to answers your question briefly, the amount of water we will be providing under Stage 2 covers an area from Rio Grande through Port Antonio to Fairy Hill. A number of developments have been planned and they are taken into account in terms of water volume. In terms of providing water to these areas, this project will provide high pressure main through the town to enhance pressures to developments in the west and, under Stage 2, another high pressure main to provide water to the east.

**9. Dr Donald Rhodd:** Is this Stage 1 only concerned with distribution and not improving the source?

**Response:** Correct. We provide high pressure to enhance flow to the areas to the west and east to improve system. This has been taken into account.

**10. Dr. Donald Rhodd:** I was previously told that the project will begin in November to December 2006. I am now hearing that you will be starting in six months time. People are getting anxious and frustrated. Is this the final start up date? What is causing the delay?

**Response:** If we take into account where we are, time period of start up, prequalification of contractors, getting tender, tender evaluation, and contractor mobilization, this is five to six months from programming point of view. However, there are other factors, such as finance which will determine the actual start date.

**Response:** NWC; A number of things have caused delays. We were advised from NEPA that this Stage 1 project did not need an EIA. Now they have said we needed various permits. We therefore stopped the project and started working on this and this EIA is the result of this work.

We will install 30meters in different locations to tell us where we are losing water. This will lead into leak detection and major construction. Work should start in November, and major construction in six months.

The project is in collaboration with NWC, the Government, and the European Investment Bank. Before the bank gives any money, the government has to make a commitment. The government has provided funding so far and the bank is now ready to begin funding. I spoke to them last Thursday and they are satisfied with the commitment from the government. The funds are here to carry the project through with a start in February to March next year.

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Comment from Mr McCarthy (NEPA). The ToR for the project changed from the original scope which indicated mains renewal and expansion rather than mains repair. Mains repair do not require a permit.

**11. Mr. Holgate:** The problem is water. We have laid pipes all over. Even after the rains there is no water. Where is the water coming from? The storage capacity is only one million gallons.

**Response:** (Colin Bell) This will be in Stage 2

**12. Mr. Holgate:** Five years ago pipes were laid in Fairy Hill

**Response:** Those pipes were laid to the east. We are providing high pressure main to feed these pipes but they will not deliver the full flow until the completion of Stage 2 as there is insufficient water resources at present.

**13. Mr. Holgate:** My hotel is 450 feet above sea level. Will I have to be pumping water.

**Response:** The problem is there isn't enough water in the system at present but under Stage 2 the full service will come into effect. There is a leakage repair work to complement this. That 70% losses will be cut down to 50% or lower. This will also result in an increase in water supply.

**14. Mr. Holgate:** In San San everyone pumps water. After the high pressure installation do think we will get water at 450 feet?

**Response:** The source from Grants Level deals with this. There will be sufficient water put in the system under Stage 2, however, the water feeds into the reservoir at West Retreat. If the location to be fed is higher than West Retreat a booster pump will be needed to get it up the hill. Since you are above our level, West Retreat is 125m or 375 to 400 feet, you are at border line you might still have to pump.

**15. Mr. Holgate:** We have several communities above this level. Stony Hill can accommodate pumping for Rio Grande.

**Response:** That's a different project.

**16. Mr. Holgate:** Will you work at nights?

**Response:** We are not considering it.

**17. Portland Environmental Protection Association (PEPA) -** Clearing of channel of Annotto River Removal of mangrove is not a good idea as this is the only mangrove site in Port Antonio and is used as a teaching site for schools. It is requested that funds that are allocated so that more sustainable measures are put in place.

**Response:** Management of catchments is a better way to deal with the problem. A lot has happened in catchments certainly in the short to medium term. I do not have the figures, but the amount of money it takes to clear the river is cheaper than any other alternative measures. They are very long term or very expensive. We are not cutting a new channel through the mangrove we are reinstating the existing channel what it was like before it become overgrown. [PEPA] The mangrove is acting as a filter and intercepting garbage which would otherwise end up in the harbour. All I am asking is for a little more investigation into the possible alternatives. Response: The cost of alternatives does not justify further investigation. We are not removing the mangroves, we are cutting them back. We are reinstating channels, trimming them back and there will be lots of mangrove remaining. The problem of solid waste disposal is not the responsibility of NWC and another organization or NGO will address that issue.

#### **Response from NEPA**

Jamaica is bound to certain conventions on how we relate to certain habitats under the RAMSAR agreement. Jamaica is guided in terms of how we treat wetlands and mangroves. If certain areas are cut back, those will have to be planted in suitable locations. You will not lose out on mangroves.

**Response:** We will not stop the ecosystem from functioning. We propose replanting of mangroves but it is not always successful. A scheme could be devised where mangroves are replanted.

**18. Robert Stevenson (Port Authority):** I am concerned about Stage 1 without Stage 2. We do not want a situation where Stage 1 ends and Stage 2 is years down the road. We need a timetable, a starting date and we need to know when it will finish so that we can plan when we can make our connections to the sewerage system. Was development of Titchfield Hill and Navy Island taken into account in the system design as it is waiting a timetable of when it can be plugged into the system.

**Response:** In terms of a timetable, we have a design for the full Stage 1 and Stage 2 project, however, there are concerns about the sewage aspect of it which we need to investigate further. We are not forgetting sewage treatment. If we proceed as we have we are not going to delay Stage 1 and it can run independently of Stage 2. Those concerns will be addressed and are still under review. As soon as we have come up with a satisfactory plan we will let people know the solution. We do not want to make the same mistake as in Negril in terms of soil condition.

The project is a 38 month design to completion. We have allowed 1 year for design, which is almost complete. We are doing reviews. We are 2 months behind but we still intend to deliver in 38 months, which would be the middle of 2009

With regards the scope of the project, we are advising parish council in meetings at Portland Development Committee. We were made aware of plans and made provisions for that system.

**19. Roberts Stevenson (Port Authority):** Have sewage and water for Titchfield and Navy Island been taken into account; we need one-to-one discussion with your team.

**Response:** As far as we are aware we have taken into account plans for Titchfield and Navy Island.

**20. Silvia Mckenzie (Citizen):** The quality of water we are consuming is not safe. What is being done to improve water quality? Months ago I asked the Health Department to check on water quality at my school. I have not got a report. It is very frightening with so many children drinking water. How many persons are purifying water? I am concerned about health of children.

**Response: Mr. Panton (Public Health Inspector):** Water samples collected and sent to the lab showed that water quality is acceptable.

**Response:** I have to say I am very surprised of that question. Every time I have been to Port Antonio I drink tap water and I have never had a problem. Water is chlorinated to stop any bacteria that might come into it. In institutions it is the problem with storage rather than the municipal water itself.

**NWC Water Quality Manager:** Although there is the possibility of quality being compromised by infiltration, there is however enough chlorine even when there is infiltration to kill any bacteria. Everyday we take samples and test them before it is consumed.

**21. Mr Forman :** There is little or no reference made to development of Portland. Is this project related to the development of Portland.

**Response:** I do know that this project is part of a master plan for development of Portland. Others will come after it. This is a part of the 1996 UDC Development Masterplan.

**22. Mr Forman :** The committee is aware that there are planned developments for Portland. I haven't seen anyone from the parish council. They coordinate all developments. Were these plans taken into account? Is this the catalyst?

**Response:** As I said, we are part of the plan. It is moving ahead. We may be the catalyst. We are a part of the Portland Development Committee chaired by the office of the Prime Minister and the parish council too.

**23. Dexter Rowland (PNP):** My concern is the dislocation of traffic when the project starts. The streets are narrow. I think we should not wait until a contractor is appointed. You should get chairman of traffic to look at alternate routes that bypass the town.

**Response:** It is a concern. It is always difficult to install pipes and cables in urban areas. There is the potential for a lot of congestion. The traffic management plan will try to reduce this to a minimum. There will be additional congestion, this will be inevitable. We will have to put up with this in return for a permanent water supply and sewerage system. The contractor must manage the traffic via the traffic management plan which will need to approved by the police and NWA.

**24. Colin Bell:** Question to the port authority; Will the road through the marina be available for traffic?

**Response:** Robert Stevenson (Port Authority): That road is an integral part of the development. It is not designed for the type of traffic on normal urban roads.

**Colin Bell:** I can understand that on a day when there is a cruise ship it cannot be available but what about the rest of the time.

**Robert Stevenson (Port Authority):** It is a question of design.

**Colin Bell:** Even though it is our money?

**Robert Stevenson (Port authority):** Even if a request is made, it has to assessed by the board as it will affect a lot of things. At this point in time I would say that I do not think it can be considered.

**25. Mr McCarthy:** I am interested that the management of traffic is of such concern. We believe management plans are required to be made and the consultant should start to prioritize that in recruitment of contractors. It may be required before a permit is issued. Contractors should be involved I can say that the authority reserves the right to approve the traffic management plan prior to issue of the permit.

**Response:** We do have a lot of mitigation issues. We said what we expect to see in a plan by defining rules and standards. We cannot dictate in what order the contractor will work. When he has a work plan he will look and see how he will manage the traffic to complete the work plan. The contractor will turn it into a full traffic management plan.

## **APPENDIX F**

### **Copies of Comments Sheets Received from the Public Presentation**

**APPENDIX G**  
**NEPA Comments**

Ref. No. 03EA2002 39/349

February 6, 2007

Mr. Randy Maxwell  
Project Manager  
National Water Commission  
28-48 Barbados Avenue  
P. O. Box 65  
Kingston 5

Dear Mr. Maxwell:

**Re: Comments on the Environmental Impact Assessment (EIA) Report for the proposed Port Antonio Water, Sewerage and Drainage Project by National Water Commission**

The National Environment and Planning Agency (NEPA) has reviewed the captioned Environmental Impact Assessment Report and the comments are attached for your attention.

Please address these comments and submit response, in writing, to NEPA, along with an electronic copy to facilitate expeditious circulation and review.

Do not hesitate to contact us for clarification on any matter.

Yours sincerely

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Joseph McCarthy  
for Chief Executive Officer

cc: Frances Blair - Manager, Applications Secretariat



**COMMENTS ON ENVIRONMENTAL IMPACT ASSESSMENT (EIA)**  
**FOR THE PORT ANTONIO WATER, SEWAGE AND DRAINAGE**  
**PROJECT– STAGE 1 BY NATIONAL WATER COMMISSION (NWC)**

## **GENERAL COMMENTS**

The Environmental Impact Assessment (EIA) Report outlines a fairly comprehensive study of the proposed project.

### **Sewage Conveyance**

Lift stations should be equipped with standby power generation equipment and standby pumps. The location and construction of any lift station should be approved by the Local Planning Authority.

### **Flooding and Drainage**

A comprehensive Surface Drainage/Storm Water Plan should be developed for the review and approval of the National Works Agency (NWA).

It is recommended that a detailed Flood Impact Assessment of the Turtle Crawle River be conducted and presented to the Water Resources Authority and the National Works Agency for review and comment. This assessment should include the evaluation of the impact of flood levels associated with normal and extreme rainfall events on aspects of the proposed project.

## **SPECIFIC COMMENTS**

### **Water Supply**

Page 4-12, Groundwater and Springs, Sections 4-25 to 4-39

There is a proposal to increase abstraction from the Grants Level wellfield, however investigations to confirm the availability of the additional water are to be done.

### **Groundwater and Springs**

Is it normal to use the annual minimum 30-day discharge as a flow index for assessing the sufficiency of domestic surface water supplies? In allocating surface water resources the WRA has been using the  $Q_{90}$  (or flow that is equaled or exceeded 90% of the time as

determined from a flow duration analysis) as the reliable yield of the river. This flow, less the  $7Q_{10}$  (annual minimum 30-day discharge from a 1 in 10 year return period) was the basis for allocation.

The Water Resources Development Master Plan (WRDMP), now under revision, has suggested the continued use of the  $Q_{90}$  for reliable surface flow determination. The reference in this section to an “annual minimum 30-day discharge from a 1 in 10 year flood event” suggests some misunderstanding of the low flow probability concept.

The reason given for using Rio Grande at Alligator Church data instead of Fellowship data to determine statistically the reliable yield of the river at Fellowship has no merit. Any dependence, randomness, trends, etc observed in time series should be similar for the next, as we are talking about 2 stations on the same river.

The environmental flow that is proposed in the WRA revised 2<sup>nd</sup> draft of the Water Resource Master Plan is 60% of the  $7Q_{10}$  (annual 7-day minimum mean flow with a 10 year return period) and not 40% of the annual minimum daily discharge with a 10-year return period as stated. The  $7Q_{10}$  for the Rio Grande at fellowship is  $1.81\text{m}^3/\text{s}$  hence the environmental flow would be  $1.1\text{m}^3/\text{s}$  which in this case would be greater than the residual flow of  $0.938\text{m}^3/\text{s}$  projected.

NB. The actual flow may have been greater if the Fellowship data and not the data generated using Alligator Church data were used.

### **Hydraulic Model of Turtle Crawle**

The report on the hydraulic modelling conducted of the Turtle Crawle area for a 1 in 100 year storm event should be included in the EIA report and submitted to the Water Resources Authority for review.

### **Flooding at the Annotto River**

The flood mitigation plan has not addressed the mitigation of the high levels of sediment entering the River. The potential for interventions such as bank stabilization, reopening backwater channels and the reclamation of former mangrove areas may be explored.

Every effort should be made to avoid the removal of existing mangroves or ensure the removal of only minimal amounts. The removal of mangroves could add further to sedimentation in the lower reaches of the Annotto River and increased nutrient loading in the bay.