

Comments on the Environmental Impact Assessment (EIA) for the Proposed Soapberry Wastewater Treatment Plant in St. Catherine

General Comments

The EIA Report prepared for the proposed Soapberry Wastewater Treatment Plant is relatively limited for such a major project. The report was lacking in critical technical design and operational matters.

Additionally, several significant environmental issues were not adequately addressed.

Traditionally, sewage treatment by waste stabilization ponds utilizes a series of ponds specifically designed for different functions. Frequently, anaerobic ponds are the first followed by a series of facultative ponds ending with the maturation ponds. No differentiation of these different pond systems was provided in the EIA.

Specific Comments

Section 5.4.8 - Water Quality

The EIA lacks an analysis of how the discharge of effluent from the proposed Wastewater Treatment Plant (WTP) would impact local water quality

Section 5.4.8 of the EIA states: “Impact on water quality are anticipated as being only positive impacts as treated sewage effluent will significantly reduce pollutant loading to the harbour.”

The proposed WTP would discharge its effluent into a discrete location - the Rio Cobre and the Hunt’s Bay. It is essential to understand how the proposed WTP would impact water quality in the Rio Cobre and Hunts Bay. A proper quantitative analysis should therefore be undertaken.

A model for the type of analysis to be undertaken to determine how the proposed Soapberry WTP would impact water quality in the Rio Cobre and Hunts Bay is provided at <ftp://dnr.metrokc.gov/WTD/carnation/eis/docs/DEIS/ch06.pdf>

Section 7 - Development of an Environmental Management and Monitoring Plan

The EIA lacks information about how the Construction and Operation Phases of the project (including effluent and water quality) will be monitored.

The Environmental Management and Monitoring Plan will cover Construction and Operation Phases of the project. It is important therefore, that this Plan be submitted to the Agency and approved prior to the commencement of any construction activities.

Section 8 - Consideration of Alternatives

The EIA fails to adequately justify the choice to build a WTP based on an oxidation lagoon system design rather than a waste-activated system design

The Proponents justify the choice of Oxidation Lagoon System based on the lower capital and operating costs and other advantages of an oxidation lagoon system even though a waste-activated system achieves better removal of organic pollutants and nutrients and requires less land. However, there is no quantitative analysis of this choice in the EIA. Additionally, despite the stated low capability of the preferred option to remove nutrients, no other treatment option was analysed, for example the use of Constructed Wetland Systems, chemical removal of Phosphorus, etc.

The preferred option should be capable of treating to generate an effluent of quality to meet the NRCA Sewage Effluent Standards.

Flood Plain analysis

A project of this size should be subject to flood plain analysis. Such analysis should consider pre and post project scenarios with special attention to the possibilities of increased flooding of nearby communities. Clear flood plain maps should be presented for the scenarios.

Assessment of the Risk of Failure of Ground Conditions

An assessment of the vulnerability of the site to earthquake tremors should be conducted and the findings used to guide the plant design to minimize the risk of failure of the site. Previously reported drilling results in the area have indicated the presence of relatively continuous layers of peat and saturated soils (i.e. water table at or above ground level) within the alluvium sequence. In the event of a significant earthquake, the peat may act as a lubricant and the saturated soils become fluidized resulting in the loss of soil strength and the disintegration of the structures of the plant.

Ground Subsidence

The EIA Report needs to give consideration to the potential for ground subsidence given the likelihood of there being significant peat in the alluvium sequence underlying the Soapberry site. The bearing strength of peat is very low as indicated by the significant post commissioning subsidence at the site of the Negril wastewater treatment site, which is located in similar ground conditions as the Soapberry site. Also, given that peat is 90% water, the necessity to artificially lower the water table by drainage is likely to result in additional ground subsidence. This raises further doubt about the suitability of the site that needs to be address by its structural design.

Potential Flooding of the Soapberry Site

It is not clear that the EIA report has considered the aspects of flood control/drainage at the site. The water table in this area is known to be essentially at or above ground level. Therefore, rainfall on the site will remain on the surface i.e. not infiltrate into the

subsurface. Also, there is evidence of the subsurface movement of bank infiltration arising from the Rio Cobre flowing through the alluvium to discharge into the Duhaney River. The proposed drainage of the site has implications for continuing subsidence, possibly with ground surface elevation falling below mean sea level with the implication for pumped drainage.

Improvement in the water quality of the Harbour

Section 2, Pg 13 - Project Description

“The population already connected to the city system will be served by the first module at Stage 1.....”

The EIA needs to place the existing proposal in its proper context as Phase 1 of the proposed system cannot accommodate the flows from the existing Western and Greenwich Sewage Treatment Plants in Kingston and St. Andrew. The Sewage Master Plan for Kingston envisaged the long term generation of 250,000 m³/d (55 migd) of sewage. Presently, in excess of 90,000 m³/d (20 migd) of inadequately treated sewage is being discharged into Kingston Harbour. Phase 1 of the Soapberry plant proposes to treat only 75,000 m³/d (16.5 migd). The touted rehabilitation of the Kingston Harbour would therefore not be realized.

Reuse of the treated effluent

The proposed disposal of the treated effluent into Hunts Bay represents an un-necessary waste of a potential water resource. Whereas, direct re-use of the treated effluent for irrigation on an aquifer (the Rio Cobre alluvium) being used as a source of domestic water supply is not advisable, it could be artificially recharged into the saline section of the Rio Cobre limestone aquifer which underlies the Rio Cobre alluvium aquifer to create a freshwater lens that may be recovered as irrigation well water. The domestic water supply to Kingston and Southeast St. Catherine having expanded at the expense of irrigation water, it seems only fair that it should pay for the return of the treated effluent to the Agricultural Sector.

Additional operational information on the radial flow recirculation oxidation lagoon.

At the Public Presentation of the project it was said that this was not a new technology but was already implemented in countries such as New Zealand and Israel. The Designing Engineers should present literature review, data from these countries and contact information of regulators and other agencies for us to verify design claims. The information submitted should include mitigation measures for problems encountered.

Maintenance of mechanical equipment

The EIA identifies the lack of maintenance of mechanical equipment as one of the reasons why existing sewage treatment systems do not operate properly. With this in mind the concept of installing sand filters with the incumbent backwash pumps, instrumentation and controls appears contrary to the rational for using natural system such as waste stabilization ponds and constructed wetlands.

Septage Handling and Treatment

At the Public Presentation of the project it was stated that the treatment facility will be accepting septage generated in the Greater Kingston and surrounding areas. The volume of septage to be accepted should therefore be clearly stated, as well as the specific equipment to hold and introduce septage in a controlled manner.

Sludge Management

The arrangements for handling sludge was glossed over, although it was stated that sludge from the plant is to be disposed of at the nearby Riverton Waste Shed. No estimate of the sludge volume, the potential hazard and environmental impact was cited. Secondly, the EIA does not speak of an agreement with the National Solid Waste Management Authority on this matter.

Clay Supply

Reference is made to in situ clay for liner, however, projections of how much is present at the site is not discussed. Explanation on this is needed to determine sufficiency of the resource for the entire project. In addition, in situ clay as liner require proper checks be done to verify the quality of the clay

Load Bearing Capacity

Measures to deal with the low load bearing capacity of the subsoil, as described in the soil investigation report, were not proposed.

Treatment Capacity

A Master Schedule showing tie-in dates and sewage capacity, including adding new communities is necessary to be sure treatment capacity is available to handle proposed sewage flows.

Table 2.2, Pg 18

Phosphorous removal data is missing from Table 2.2.

Table 3.1, Pg 22

Table 3.1 has the standard for Faecal Coliform as 1000 MPN/100 ml. This should be 200 MPN/100 ml.

Section 2.1, Pg. 14 Construction of WTP Facility

The change of design from the use of wetlands in the final treatment step to the use of sand filters is questioned. Sand filters for the treatment of large volumes of wastewater are likely to present a major operational challenge. Are there models which support the use of sand filters with this scale of plant? Why was the wetland option eliminated?

Section 2.3, Pages 16 and 17, STP Operations

The re-circulation rates quoted on pages 16 and 17 are not consistent as the re circulation rate mentioned on Page 16 is different from the rate on Page 17. Further, it is not clear what water stream is referred to by the first and second component of the ratio.

Section 4.1, Page 23 - Table 4.1

The Annual Mean seems to be incorrect as it was calculated by averaging the monthly means. The Annual Mean should be an average of annual totals.

The Meteorological office should be contacted for more recent data, to say up to year 1999.

Section 4.4, Page 30, Surface Drainage

There is an assumption that ponding of the area will be reduced with the construction of the lagoons. This may not be a logical deduction and a hydraulic assessment of the area should be undertaken to confirm this.

The detailed drainage map of the proposed project is absent from Appendix 2.

Table 4.8, Water Quality Data

What are the sample dates and how many samples were collected?

Section 4.9.1, Page 45, Flood Hazard

The Rio Cobre Flood Plain Map Sheet 6 dated May 1994 indicates a 100year flood as having a peak discharge of 55,800cubic feet per second (1580m³/s) and the 50 year flood with 41,600 cubic feet per second (1178m³/s). What documents/models have informed the quoted flows of 2,500 m³/s for the 100year flood and 2000m³/s for the 50 year flood?

Section 4.10.1, Pg 51, The Communities

How near are the communities of Waterford, Riverton City and New Haven to the project site? The population size was not indicated for each community mentioned.

Section 5.3.7, Page 68, Sewage and Litter Management

Portable chemical toilets should be provided for workers during construction and disposal of contents should be in accordance with guidelines of the KSA Public Health Department.

Section 5.4.8, Page 74, Water Quality

The issue of high phosphate loading into the Rio Cobre and Hunts Bay has not been addressed.

Although generally, treated sewage effluent from Oxidation Ponds is considered suitable as irrigation water, the proposal to apply the effluent as irrigation water to sugar cane fields which sit above an aquifer used as a major drinking water source, must be carefully evaluated. This evaluation has not been conducted in this Report.

Flow Measurement

Flow measuring devices should be incorporated in the design of the inflow conveyance systems for influent sewage, so as to ensure accuracy in determining inflow volumes.

Social Issues

The plant site is adjacent to several low-income established communities, including Riverton City and Riverton Meadows. While the benefits of the project promises to impact on the health of the Hunts Bay and its ecosystem, the possible issues of civil unrest should not be overlooked and specific educational and civic projects need to be undertaken to ensure buy-in by the communities.