

PARLIAMENT OF KENYA LIBRARY

**NATIONAL ASSEMBLY**

**TENTH PARLIAMENT**

**(FOURTH SESSION)**

**DEPARTMENTAL COMMITTEE ON HEALTH**

**REPORT ON**

**ALLEGATIONS OF DISCHARGE OF UNTREATED  
WASTEWATER INTO LAKE NAIVASHA BY THE NAIVASHA  
WATER SERVICES & SEWERAGE COMPANY**

**August 31, 2010**

**(Submitted pursuant to the Direction of the House of 25<sup>th</sup> August, 2010)**

CLERKS CHAMBERS  
PARLIAMENT BUILDINGS  
NAIROBI

August, 2010

## PREFACE

**Mr. Speaker,**

The Departmental Committee on Health of the National Assembly was constituted on June 17, 2009. The mandate of the Committee is contained in Standing Order 198 which states-

**198.** (1) *There shall be select committees to be designated Departmental Committees which shall be nominated by the House Business Committee and approved by the House at the commencement of every Parliament.*

(2) *Unless the House otherwise directs, the Departmental Committees shall be as set out in the Second Schedule.*

(3) *The functions of a Departmental Committee shall be: -*

(a) *to investigate, inquire into, and report on all matters relating to the mandate, management, activities, administration, operations and estimates of the assigned Ministries and departments;*

(b) *to study the programme and policy objectives of Ministries and departments and the effectiveness of the implementation;*

(c) *to study and review all legislation referred to it;*

(d) *to study, assess and analyse the relative success of the Ministries and departments as measured by the results obtained as compared with their stated objectives;*

(e) *to investigate and inquire into all matters relating to the assigned Ministries and departments as they may deem necessary, and as may be referred to them by the House or a Minister; and*

(f) *to make reports and recommendations to the House as often as possible, including recommendation of proposed legislation.*

The Members of the Committee are: Hon. Robert O. Monda, M.P.(Chairperson); Hon. (Dr.) Nuh Nassir Abdi, M.P.(Vice-Chairperson), Hon. Sheikh Muhammad Dor M.P.; Hon. Cyprian O. Omolo; M.P; Hon. Fredrick Outa, M.P.; Hon. Joseph O. Magwanga, M.P.; Hon. Thomas M. Mwadeghu, M.P; Hon. Victor Kioko Munyaka, M.P; Hon. (Dr.) David Eseli, M.P; Hon. (Dr.) Boni Khalwale, M.P and Hon. Joseph Lekuton, M.P.

**Mr. Speaker,**

According to Schedule II of the Standing Orders, the subject under the committee is “Matters related to health, medical care and health insurance”. The House will recall that on Wednesday, August 25, 2010, the Member for Emuhaya (Dr. Wilbur Ottichilo) rose to ask Ordinary Question No. 279. The said Question was directed to the Minister for Environment and Mineral Resources. However, in his response, the Minister was not able to ascertain whether the allegations were true. Consequently, the Chair directed that *the Departmental Committee on Health ascertains the allegation that the Naivasha Water and Sewerage Company is releasing raw sewerage into Lake Naivasha*. The Chair also directed that the Committee reports the findings on Tuesday, August 31<sup>st</sup>, 2010.

**Mr. Speaker,**

The Committee undertook an Inspection visit on Monday, August 30, 2010 pursuant to the direction by the Chair. The Committee was also accompanied by officers from the National Quality Control Laboratories. Efforts to have officer from NEMA accompany the Committee were unsuccessful, partly due to the short notice. The Inspection visit involved meetings with the Management of the Naivasha Water and Sewerage Company and site inspections to the treatment plant and discharge

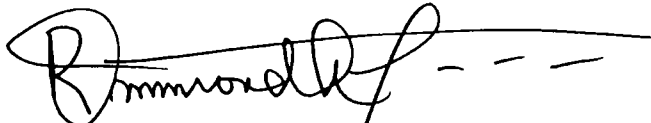
points. In summary, the Committee confirmed the Company is unable to handle wastewater/sewerage from the Town. Further, the Company treats the sewer only up to about 25% of the recommended level. The result is partially treated waste-water being discharged into Lake Naivasha.

**Mr. Speaker,**

The Committee wishes to record its appreciation to the National Quality Control Laboratories for their contribution to sample and test the wastewater. Further, the Committee is indebted to the staff of the National Assembly for the services they rendered to the Committee. It is their commitment and dedication to duty that made the work of the Committee and production of this Report possible.

**Mr. Speaker,**

It is now my pleasant duty, on behalf of the Committee to present and commend this Report to the House.

A handwritten signature in black ink, appearing to read 'R. Monda', with a long horizontal line extending to the right.

**HON. (DR.) ROBERT O. MONDA, MP**

**CHAIRPERSON, DEPARTMENTAL COMMITTEE ON HEALTH**

**August 31, 2010**

# REPORT ON ALLEGATIONS OF DISCHARGE OF UNTREATED WASTEWATER INTO LAKE NAIVASHA BY THE NAIVASHA WATER SERVICES & SEWERAGE COMPANY

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## CHAPTER I: BACKGROUND

### Introduction

1. Municipal waste-water or sewer as is commonly known, is the combination of liquid or water-carried wastes originating in the sanitary conveniences of dwellings, commercial or industrial facilities and institutions, in addition to any groundwater, surface water and storm water that may be present. Untreated waste-water generally contains high levels of organic material, numerous pathogenic microorganisms, as well as nutrients and toxic compounds. According to UN-Water, it thus entails environmental and health hazards and, consequently, **must immediately be conveyed away from its generation sources and treated appropriately before final disposal.** The ultimate goal of waste-water management is the protection of the environment in a manner commensurate with public health and socio-economic concerns.

### **Wastewater and Sewerage: A Global perspective.**

2. According to the United Nations Water Programme (UN-Water), more than 1.5 million children die from waterborne diseases every year. Some 884 million people have no access to safe drinking water and over 2.5 billion people worldwide live without adequate sanitation. Pollution driven by a growing population, poor sanitation, sewerage and drainage systems are the main culprits.
3. According to the same source, safe drinking water and sanitation are also central to alleviating poverty. However, every day, 2 million tons of sewage and other

effluents drain into the world's waters. In developing countries, 90 % of raw sewage and 79 % of untreated industrial waste are dumped into surface waters.

4. The goals of safe water and improved sanitation are ingrained in the UN Millennium Development Goals. However, the UN warns that if current trends continue, the global community will miss its 2015 sanitation target by almost one billion people. Human health and environmental sustainability are at stake if no action is taken.

#### **Common Contaminants**

5. Some of the contaminants in the waste water and sewerage include Suspended solids, Biodegradable organics and Pathogenic organisms. Also, Priority pollutants, including organic and inorganic compounds, may be highly toxic, while refractory organics can be harmful to human and aquatic life. Heavy metals and Dissolved inorganic constituents also have to be removed for waste-water for reuse. The level of pollutants in Treated Sewer is measured by way of Chemical and Biological Methods. The Biochemical Oxygen Demand (B.O.D) is a chemical procedure for determining the amount of dissolved oxygen needed by aerobic biological organisms in a body of water to break down organic bacterial present in a given water sample at a certain temperature over a specific time period. It is mostly commonly expressed in milligrams of oxygen per liter of sample of during 5 days of incubation at 20°C and is often used as robust surrogate of the degree of organic pollution of water. B.O.D can be used as a gauge of the effectiveness of waste-water treatment plants. The WHO recommended level is 10 ppm.

#### **Lake Naivasha**

6. Lake Naivasha, a Ramsar site, is threatened by the recent development of the horticultural industry along its shores, overpopulation, upper catchment activities, and invasive species. Levels of organic pollution estimated by chlorophyll-a

concentrations, water parameters and water hyacinth characteristics showed that the studied locations were highly differentiated. Although contrasting information between parameters hampered determining the main source, the flower farm area appeared to harbour high levels of organic pollution. The community's perception is therefore true to some extent, although probably overestimated. As people mostly blamed the causes they were involved in, awareness-raising programs for all stakeholders will be an important step towards lake conservation.

7. Since the first flower farms of the 1980s, there has been a fairly constant increase in the area of land cultivated, which 4,000 ha in the last five years. There is evidence for fluctuations in lake level partly due to an increase in demand of water for irrigation and presence of potential pollution discharge from the horticulture industry. The arrival of the labour-intensive horticultural industry to the area has also brought with it a large number of employment opportunities. Because of this, the human population of the town of Naivasha and the lake hinterland has increased fifty-fold over the past three decades. A total of eleven new settlements, housing an estimated 150,000 people, pose further threats to the lake with its lack of waste treatment facilities or piped water supply in the majority of areas. The lakeshore near these settlements is also degraded by human use for washing, domestic stock watering and laundry. On the north-eastern shores of the lake lies the town of Naivasha with a population of approximately 150,000. As the town's sewage collection system only covers part of its area, much of the town has open drains that carry waste during heavy rains. Given the low level of the lake in the past decade, the urban edge is several hundred metres away from the water, so untreated waste and partially-treated sewage effluent seep into the former lake-bed soils.

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8. The lake is considered eutrophic since the early 1990s. Indeed, the average pH value alone exceeds WHO limits for drinking water ( $\text{pH} < 8.0$ ), although most people extract their drinking water from the lake, frequently without treating it.



## CHAPTER II: COMMITTEE FINDINGS

### **The Field Trip**

9. On Wednesday, 25th August, 2010, the Member for Emuhaya (Dr. Wilbur Otichilo) asked the Minister for Environment and Mineral resources the following Question by Private Notice.
- (a) *Whether the Minister is aware that Naivasha Water and Sewerage Company is releasing raw sewerage into Lake Naivasha and ,if so, why no action has been taken to stop the pollution of the Lake; and*
- (b) *What damage control the Ministry is undertaking to restore the lake and what plans are in place to compensate the fisher men for the loss of income?*
10. The House was not satisfied with the Minister's response, especially to supplementary questions. In this regard, the Speaker directed as follows:-
- “Mr. Assistant Minister, under the circumstances, the Chair directs that this Question appears in the Order Paper next week on Tuesday. The Assistant Minister had better come with an answer which essentially states the facts as they are, and tells the House what action your Ministry is taking on this very serious matter. In the meantime, the Chair directs the relevant Departmental Committee to hastily carry out its own investigations and report back to the House”***
11. Pursuant to the directive, on Monday, August 30, 2010, the Committee embarked on a field trip to ascertain the allegations. The following Members were undertook the trip.
- (i) Hon. (Dr.) Robert Monda, MP –Chairman  
(ii) Hon. (Dr.) Boni Khalwale,MP  
(iii) Hon. (Dr.) David Eseli,MP  
(iv) Hon. (Dr.) Kioko Munyaka,MP

- (v) Hon. Fred Outa.MP
- (vi) Hon. Cyprian Omollo, MP
- (vii) Hon. Joseph Magwanga,MP

12. At the Inspection visit, the Committee was accompanied by an officer from the National Quality Control Laboratories. The Committee obtained evidence from interviews to the management of the Naivasha Water and Sewerage Company. The Committee also undertook inspections and observed the condition of the Sewerage treatment plant. Further, samples were taken and tested for contamination. This was done at the Sewer entry and discharge points. The Committee was flanked by the Management of the Company, including its Managing director, the District Water Services Officers, the Company's Sewerage Officer, the District Medical Officer of Health and the Public Health Officer, amongst other officers.

### **Observations**

13. From the evidence adduced, observations made and tests carried out, the Committee found out that-
- (i) **Naivasha water and Sewerage Company does discharge raw sewerage into the lake.** The Company undertakes partial treatment of the wastewater. The UN-Water and the WHO recommends that prior to discharge, wastewater be treated up to 10ppm. This means up to a level where only ten litres of oxygen would be required to further aerate every one million Litres of waste water. This is considered fit for Discharges since the natural air would thereafter be able to clean the water, naturally. The Committee founds out that, in average, the Company received wastewater at 700ppm and discharges at 300ppm. This is way below the recommended level of 10ppm;

- (ii) The Treatment Plant used by the Company was commissioned in 1980 to cater for a population of about 30,000 people. It did not take into account the population (current population is over 300,000 people) and industrial growth around the lake region. Moreover, the Plant, that is way below the capacity is partially functional. This means that the Aeration, Filtration and Settling Levels, which are crucial in wastewater treatment, are skipped. The result is untreated waste;
- (iii) The Company needs sufficient wet land to fully accomplish the sewer treatment process. This is lacking. Currently the riparian segment of the lake intended to used by the firm has been encroached by ever escalating human population and this hinders proper streamline of the sewer systems;
- (iv) To fully comply with WHO and UN-Water Standards, Company requires new ponds, raw filter and grass ponds and a complete overhaul of the Treatment Plant. To do this, it requires about Ksh. 200 million;
- (v) The treatment plant was constructed in 1980 by which time the population of the catchment area was about 30,000 people. Today, the population stands approximately at 300,000 people. This therefore constraints facility, and therefore does not support the daily work load;
- (vi) The lake is highly contaminated and the aquatic organisms, specifically fishes have died as a result of discharge of waste materials into the lake. They are other additional factors such as floriculture farms, some discharge raw serve into lake while other conned their sewer line to company's network some flower farms have pending cases in court.

#### **Contents of the waste-water discharged**

14. The analysis of Samples revealed that the major contaminates due to the failure in the Company's Wastewater Treatment Plant include:

- (a) *Suspended solids.* These have lead to development of sludge deposits and anaerobic conditions when the untreated wastewater is discharged to the aquatic environment. The Committee observed that most of the ponds and aerations areas are blocked by the sludge;
- (b) *Biodegradable organics.* These are principally made up of proteins, carbohydrates and fats. They are commonly measured in terms of BOD and COD. When discharged into inland rivers, streams or lakes, their biological stabilization can deplete natural oxygen resources and cause septic conditions that are detrimental to aquatic species;
- (c) *Pathogenic organisms.* These are the likely causes of infectious diseases around the lake;
- (d) *Refractory organics.* Chemical Analysis revealed the presence of refractor organics. These pollutants tend to resist conventional waste-water treatment include surfactants, phenols and agricultural pesticides and their effect on water is detrimental to both human and aquatic life;
- (e) *Dissolved inorganic constituents* such as calcium, sodium and sulfate were detected. These are often initially added to domestic water supplies, and ought to be removed for waste-water prior to reuse;

- (f) *Priority pollutants and Heavy Metals.* These include organic and inorganic compounds may be highly toxic, carcinogenic, mutagenic or *teratogenic*. The complete analysis of the levels of priority pollutants and Heavy metals is awaited from the NQCL;

### CHAPTER III: RECOMMENDATIONS

#### **Recommendations**

**15. The Committee recommends-**

- (i) That, the government provides funding for the the replacement of the Naivasha Water and Sewerage Company's (NWSC) waste-water treatment plant. The NWSC should, through the parent Ministry, present the budget to the Treasury for approval and funding during the next financial year;
- (ii) That, the Company upholds and maintains the UN-Water and WHO levels of waste-water treatment. This should include the maintenance of regulation and the implementation of International Standards The company requires funds to build ultra modern plant to cater for the ever increasing population growth;
- (iii) The NWSC requires proper biological treatment of sewer and by all other stake holders including floriculture farms prior to discharge in to the Lake.

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