



"TTFTTNFOU PG)FBWy .eUBM \$PODFOUSBUJPO
3JWFS 8BSSJ 4PVUI -PDBM (PWFSONFOU "SFB

,QGxvwuldo 6DIHW\ DQG (QYLURQPHQWDO 7HFkQRORJ\ 'HSDUWPHQW 3HWUROHXP 7UDLQLQJ ,QVWLWXW

Abstract

Composite sediment samples were collected from three sampling points along Ubeji River in Ubeji community
:DUUL 6RXWK /RFDO *RYHUQPHQW \$UHD 'HOWD 6WDWH LQWR ZKLFK LQGxvwuld
ZHUH SUHSDUHG IRU KHDY\ PHWDOV DQDO\VLV XVLQJ VWDQGDUG ODERUDWRU\ WH
VHGLPHQWV ZHUH FRPSDUHG ZLWK '35 OLPLWV IRU EHqwkLf VHGLPHQWV DQ

m Upstream from point of e uent discharge) S2 (point of e uents than the 90 mg/Kg permissible limits speci ed and thus safe for benthic discharge) and S3 (200 m Downstream from point of e uent discharge) organisms [2].

along the river. e samples were air dried and stored until analyzed for zinc, iron, manganese, lead, chromium, cadmium, and mercury.

Table 1 shows the location of the sampling points.

Results and Discussion

Tables 2 shows the summary of results of the mean concentration of the heavy metals investigated in Ubeji River sediments at 200 m upstream from point of e uent discharge, at the point of e uent discharge and at 200 m downstream from point of e uent discharge.

Zinc (Zn)

From Tables 2-4 the results shows that the concentration of zinc in the sediments at the upstream ranged from 16.12 mg/Kg to 18.06 mg/Kg with a mean value 17.14 ± 0.89 mg/Kg. At the point of e uent discharge the concentration of zinc ranged from 69.41 mg/Kg to 85.21 mg/Kg with an average concentration of 77.05 ± 6.29 mg/Kg. Similarly at the downstream the zinc concentration ranged from 60.33 mg/Kg to 64.81 mg/Kg. Within the 3 sampling points, the point of e uent discharge recorded 85.21 mg/Kg and 16.12 mg/Kg at the upstream the highest and lowest concentration of zinc respectively. From the results obtained and when compared to the DPR quality guidelines in estuarine sediments. e 3 sampling points were found to be less

Iron (Fe)

From Tables 2-4 the results show the iron concentration in the sediments. At the upstream the iron concentration ranged from 2.94 mg/Kg to 3.58 mg/Kg with a mean concentration of 3.26 ± 0.28 mg/Kg. At the point of e uent discharge the iron concentration ranged from 10.79 mg/Kg to 12.58 mg/Kg, with a mean concentration of 11.68 ± 0.73 mg/Kg. Similarly the iron concentration downstream from the point of e uent discharge ranged from 9.84 mg/Kg to 12.58 mg/Kg, with a mean value of 10.77 ± 1.11 mg/Kg. Within the 3 sampling points, the point of e uent discharge recorded 12.58 mg/Kg and upstream recorded 2.94 mg/Kg as the highest and lowest concentrations of iron respectively. From the results obtained and when compared to DPR (2002) sediment quality guidelines in estuarine. e results revealed that all 3 sampling points were less than the 20 mg/Kg permissible limits speci ed and thus safe to support benthic organisms.

Manganese (Mn)

From Tables 2-4 the results show the manganese concentration in the sediments. From the results obtained, the concentration of manganese in the sediments at the upstream ranged from 19.06 mg/Kg to 21.28 mg/Kg, with a mean concentration of 20.28 ± 0.91 mg/Kg. At

Location		Coordinates
Upstream	S1 – 200 metres before the outfall	$f \cdot \quad ' 1 \quad f \cdot \quad '($
0 L G V W U H D P	6 ± 3 R L Q W R I P L [L Q J Z L W K W K H H % X H Q W	$f \cdot \quad ' 1 \quad f \cdot \quad '($
Downstream	6 ± P H W U H V D I W H U W K H S R L Q W R I P L [L Q J Z L W K W K H H % X H Q W	

the point of effluent discharge the concentration of manganese ranged from 50.49 mg/Kg to 55.56 mg/Kg, with a mean concentration of 52.65 ± 2.14 mg/Kg. The concentration of manganese downstream from the point of effluent discharge ranged from 40.45 mg/Kg to 43.68 mg/Kg with a mean concentration of 41.68 ± 1.23 mg/Kg. From the results obtained and when compared to the DPR sediment quality guidelines in estuarine sediments. The values in sediments sampled at upstream

accumulate various levels of pollution. This study revealed that the sediments sampled from the Ubeji River recorded the following mean concentrations, at 200 m upstream from the point of effluent discharge. Zinc (17.14 mg/Kg), iron (3.26 mg/Kg), manganese (20.28 mg/Kg), lead (10.68 mg/Kg), chromium (36.14 mg/Kg), cadmium (1.69 mg/Kg), and mercury (0.05 mg/Kg). The results obtained shows that all the heavy metals investigated at the upstream fell within the DPR (2002) limits for the survival of aquatic organisms except for cadmium. At the point of effluent discharge, the mean concentrations were zinc (77.05 mg/Kg), iron (11.68 mg/Kg), manganese (52.65 mg/Kg), lead (47.04 mg/Kg), chromium (56.87 mg/Kg), cadmium (2.77 mg/Kg), and mercury (0.21 mg/Kg). The result shows that lead, manganese, chromium and cadmium were above the DPR (2002) limits for the survival of aquatic organisms. Analysis by ANOVA showed that there was no significant impact of effluent on the quality of Ubeji River sediments at the sampling stations under investigation at 5% significant value.