**Supplementary material:**

**Tables S1:** Surface water and groundwater quality in the study area with permissible limits of FAO (1985) and US-EPA (1992) guidelines and standards for wastewater reuse

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Parameters** | **Musi river water** | | | | **Musi canal water** | | | | **Groundwater** | | | | **FAO (1985)** | **US-EPA (1992)** |
|  |  | 2014 | 2016 | 2017 | 2020 | 2014 | 2016 | 2017 | 2020 | 2014 | 2016 | 2017 | 2020 |
| 1 | COD (mg/L) | 110 | 108 | 110 | 24 | 102 | 94 | 99 | 27 | 15 | 12 | 12 | 20 | NA | 100 |
| 2 | pH | 7.14 | 7.11 | 7.2 | 7.3 | 7.21 | 7.18 | 7.2 | 7.4 | 6.94 | 6.88 | 7.6 | 8.1 | 6.5-8 | NA |
| 3 | Electrical conductivity (µs/ cm) | 1682 | 1724 | 2017 | 1126 | 1745 | 1648 | 1772 | 1235 | 1988 | 1892 | 2000 | 1883 | 700 -3000 | NA |
| 4 | Turbidity (NTU) | 0.5 | 0.7 | 0.5 | 27 | 0.6 | 0.52 | 0.7 | 25 | 0.1 | 0.14 | 0.1 | 18 | NA | 10 |
| 5 | Fluoride as F (mg/L) | 0 | 0.06 | 0 | 0.2 | 0 | 0.08 | 0 | 0.3 | 0.08 | 0.05 | 0.06 | 0.4 | 1 | 1 |
| 6 | Total suspended soilds (mg/L) | 94 | 88 | 234 | 310 | 88 | 78 | 169 | 84 | 48 | 32 | 44 | 112 | NA | 50 |
| 7 | Total dissolved solids (mg/L) | 1098 | 1118 | 1100 | 732 | 1142 | 1084 | 1078 | 895 | 1306 | 1226 | 1348 | 1220 | NA | < 1500 |
| 8 | BOD (mg/L) | 38 | 36 | 37 | 36 | 34 | 26 | 34 | 7 | 0 | 0 | 0 | 6 | 0-25 | < 30 |
| 9 | Dissolved oxygen (mg/L) | 5.8 | 5.9 | 5.9 | 5.3 | 5.7 | 5.9 | 5.80 | 5.6 | 6.5 | 6.6 | 6.30 | 5.6 | NA | 6 – 9 |
| 10 | Zinc as Zn (mg/L) | 0.08 | 0.12 | 1.0 | 0.01 | 0.05 | 0.10 | 0.05 | 0.01 | 0.04 | 0.08 | 0.04 | 1.50 | 2 | 2 |
| 11 | Chromium as Cr (mg/L) | 0.01 | 0.03 | 0.03 | 0.0025 | 0.01 | 0.04 | 0.01 | 0.0025 | 0.01 | 0.03 | 0.01 | 0.0028 | 0.05 | 0.1 |
| 12 | Cadmium as Cd (mg/L) | 0.001 | 0 | 0 | 0.0005 | 0 | 0 | 0 | 0.0025 | 0 | 0 | 0 | 0.0015 | 0.01 | 0.01 |
| 13 | Lead as Pb (mg/L) | 0.01 | 0.04 | 0 | 0.0049 | 0 | 0.04 | 0 | 0.0025 | 0.03 | 0.02 | 0.03 | 0.0035 | 5 | 5 |
| 14 | Nickel as Ni (mg/L) | 0 | 0 | 0 | 0.0035 | 0 | 0 | 0 | 0.0025 | 0 | 0.01 | 0 | 0.007 | 0.2 | 0.2 |
| 15 | Oil and grease (mg/L) | 2.2 | 2 | 2.0 | 0.9 | 1.8 | 1.2 | 1.8 | 0.5 | 0 | 0 | 0 | 0.5 | NA | 8 |

**Table S2** Soil quality in the study area with FAO (1985) and Indian Standards (1983)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **S. No.** | **Parame**ter**s** | **Soil at 10 cm depth** | | | | **Soil at 20 cm depth** | | | | **Soil at 30 cm depth** | | | | **FAO 1985, Indian Soil Standards (1983)** |
| 2014 | 2016 | 2017 | 2020 | 2014 | 2016 | 2017 | 2020 | 2014 | 2016 | 2017 | 2020 |  |
| 1 | pH | 7.38 | 7.12 | 7.22 | 8.07 | 7.41 | 7.54 | 7.67 | 7.99 | 7.28 | 7.16 | 7.68 | 8.04 | 7.62 – 8.27 |
| 2 | Electrical conductivity (µmhos/ Cm) | 388 | 348 | 378 | 301 | 372 | 394 | 374 | 353 | 348 | 340 | 357 | 285 | ≤ 2250 |
| 3 | Sodium as Na (mg/kg) | 18.2 | 17.8 | 25.6 | 165 | 18 | 20.1 | 19.0 | 75 | 17.4 | 16 | 18.2 | 148 | 0–300 |
| 4 | Sodium Absorption Ratio | 5.407 | 5.1 | 5.230 | 0.86 | 5.288 | 4.92 | 5.129 | 0.86 | 5.052 | 5.054 | 5.124 | 0.79 | <10 |
| 5 | Chlorides as Cl (mg/Kg) | 272 | 212 | 192 | 157 | 310.8 | 296.4 | 300.8 | 296.4 | 272 | 258 | 232 | 188 | 400 – 600 |
| 6 | Magnesium as Mg (mg/Kg) | 321.5 | 318.1 | 326.8 | 787 | 333.4 | 313.2 | 323.4 | 748 | 369.1 | 374.2 | 399.1 | 729 | 0 – 500 |
| 7 | Phophorus as P (mg/kg) | 4367 | 3964 | 3751 | 581 | 4523 | 5016 | 4723 | 621 | 4527 | 4486 | 4279 | 645 | 0 – 200 |
| 8 | Potassium as K (mg/kg) | 820 | 750 | 760 | 720 | 765 | 812 | 768.0 | 830 | 745 | 732 | 755 | 750 | 0 – 450 |
| 9 | Calcium as Ca (mg/Kg) | 1944.3 | 1642.3 | 1544.5 | 1471 | 1983.6 | 1780.6 | 1883.6 | 1503 | 2003.2 | 2016.4 | 1918.5 | 1439 | 0 – 3500 |
| 10 | Organic Carbon (mg/kg) | 10100 | 9600 | 8600.00 | 4100 | 12900 | 11800 | 12900.00 | 4600 | 10700 | 10200 | 11500 | 4800 | 0.5– 0.75 |
| 11 | Nitrogen as N (mg/kg) | 4850.00 | 4620.00 | 4570.0 | 1200.00 | 4370.0 | 4560.0 | 4470.0 | 1000.00 | 4391.0 | 4378.0 | 4478.5 | 900.0 | 50 > |
| 12 | Iron as Fe (mg/kg) | 4300 | 3800 | 3900.00 | 2900 | 4000 | 2900 | 3700.00 | 3279 | 4000 | 4100 | 4600 | 5472 | 20000– 550000 |
| 13 | Bulk Density (g/cc) | 1.48 | 1.45 | 1.40 | 1.02 | 1.48 | 1.42 | 1.38 | 1.06 | 1.49 | 1.53 | 1.45 | 1.09 | 1.65 or  1.25 (wetlands) |

Contributions: Conceptualisation: LSN and Shivarajappa; Data collection: Shivarajappa and MH; First draft: Shivarajappa; Preparation of the maps: AS; Extensive correction: LSN, PKG and MJN.