

Table 3.1: Results of Physical Analysis

| Parameter | Sample (1) | Sample (2) | Sample (3) | Sample (4) | Sample (5) | Sample (6) | Sample (7) |
|--|------------------------------------|----------------------------------|-----------------------------------|----------------------------------|------------------------------------|-----------------------------------|-----------------------------------|
| Sites Electrical conductivity | Eidbabiker 0.45x10 ³ | Alshigla 0.58x10 ³ | Altakamol 0.28x10 ³ | Albashir 0.38x10 ³ | Darelsalam 0.32x10 ³ | Albarakat 0.22x10 ³ | Almaigoma 0.25x10 ³ |
| mmhos x 10³ At (25C) | | | | | | | |
| pH | 8.55 | 8.04 | 7.96 | 8.01 | 8.0 | 7.89 | 7.6 |
| Odor | Unobjectionable | Unobjectionable | Unobjectionable | Unobjectionable | Unobjectionable | Unobjectionable | Unobjectionable |
| Taste | Unobjectionable | Unobjectionable | Unobjectionable | Unobjectionable | Unobjectionable | Unobjectionable | Unobjectionable |
| Turbidity | Clear | Clear | Clear | Clear | Clear | Clear | Clear |
| Appearance | | | | | | | |

Table 3.2: Results of Chemical Analysis

| Sites | Eidbabiker | Alshigla | Altakamol | Albashir | Darelsalam | Albarakat | Almaigoma |
|---------------------------------------|------------|----------|-----------|----------|------------|-----------|-----------|
| Parameter mg/L | Sample 1 | Sample 2 | Sample3 | Sample 4 | Sample 5 | Sample6 | Sample 7 |
| Total dissolved solid | 336 | 548 | 220 | 324 | 253 | 111 | 135 |
| Total Hardness | 68 | 285 | 123 | 230 | 201 | 80 | 102 |
| Total alkalinity | 195 | 269 | 181 | 264 | 184 | 69 | 65 |
| Excess alkalinity | 135 | Nil | 61 | 36 | Nil | Nil | Nil |
| Chloride (CL) mg/L | 34 | 100 | 8 | 10 | 18 | 12 | 7 |
| Sulphate (SO₄) mg/L | 42 | 82 | 11 | 49 | 29 | 19 | 40 |
| Calcium (Ca) mg/L | 24 | 62 | 36 | 57 | 52 | 20 | 29 |
| Magnesium (Mg) mg/L | 2 | 31 | 8 | 21 | 17 | 7 | 7 |

| | | | | | | | |
|--------------------------------------|-----|-----|-----|-----|-----|-----|-----|
| Sodium (Na) mg/L | 73 | 71 | 33 | 27 | 13 | 9 | 7 |
| Potassium (K) mg/L | 16 | 5 | 5 | 5 | 3 | 1 | 1 |
| Ammonia (NH₃) mg/L | Nil |
| Nitrite (NO₂) mg/L | Nil |

| | | | | | | | |
|--------------------------------------|-------------|-------------|------------|-------------|------------|------------|------------|
| Nitrate (NO₃) mg/L | 14 | 1 | 5 | Nil | Nil | Nil | 8 |
| Fluoride (F) mg/l | 0.55 | 0.55 | 0.5 | 0.35 | 0.3 | 0.2 | 0.1 |

Table 3.3: World Health Organization (WHO) Chemical Parameters Standards (1995)

| Parameters | Acceptable Levels | Reasons for consumer complaints |
|----------------------------|-------------------|--|
| Physical parameters | | |
| Colour | 15 TCU | Appearance |
| Taste and odour | | Should be acceptable |
| Temperature | | Should be acceptable |
| Turbidity | 5 NTU | Appearance; for effective terminal disinfection. Medium turbidity <1 NTU, single sample < 5 NTU |

| Chemical Parameters | | |
|---|------------------|---|
| PH | 6.5 – 8.5 | Low PH: corrosion, high PH: taste, soapy feel. Preferably < 8.0 for effective disinfection with chlorine. |
| Total dissolved solid | 1000 mg/L | Taste |
| Total Hardness as (CaCO₃) | 500 mg/L | High hardness: scale deposition, scum formation. Low hardness: possible corrosion |
| Chloride (Cl) | 250 mg/L | Taste, corrosion |
| Sulphate (SO₄) | 200 mg/L | Taste, corrosion |
| Magnesium (Mg) | 125 mg/L | |
| Sodium (Na) | 200 mg/L | Taste |
| Ammonia (NH₃) | 1.5 mg/L | Odour and taste. |
| Nitrites (NO₂) | 1.5 mg/L | The sum of the ratio of the concentration of each to its respective guideline value should not exceed 1. |
| Nitrates (NO₃) | 50 mg/L | |
| Fluoride (F) | 1.5 mg/L | Climatic conditions, volume of water consumed, and intake from other sources should be considered when setting national standards. |

Sources: World Health Organization
Guidelines for drinking water quality