



Quarterly Water Quality Status of the Waterval River Catchment

1 Oct 2013 - 30 Sep 2014

In-stream Water Quality Guidelines

| Sample Points | Sample Point Description | Ammonia | Chloride | Fluoride | M-Alkalinity | Nitrate | Phosphate | Sulphate | Chemical Oxygen Demand | Conductivity | pH | E. coli |
|---------------|--|---------|----------|----------|--------------|---------|-----------|----------|------------------------|--------------|------|-----------|
| WAW | Winkelhaakspruit @ Secunda 26°31'12.14"S 29° 4'17.79"E | 7.00 | 48 | 0.60 | 200 | 1.50 | 2.90 | 60 | 46 | 65 | 7.60 | |
| | | 8.50 | 51 | 0.42 | 210 | 0.94 | 2.50 | 87 | 43 | 69 | 7.70 | |
| | | 11.00 | 72 | 0.41 | 195 | 2.60 | 2.20 | 62 | 42 | 76 | 7.30 | |
| | | 12.00 | 70 | 0.42 | 195 | 10.00 | 2.30 | 71 | 25 | 83 | 7.90 | |
| WAB | Kleinspruit @ Secunda 26°32'44.49"S 29° 7'46.66"E | 0.20 | 27 | 0.37 | 110 | 7.90 | 1.70 | 150 | 30 | 58 | 7.50 | |
| | | 0.57 | 20 | 0.45 | 130 | 0.83 | 0.34 | 120 | 37 | 61 | 7.90 | |
| | | 0.25 | 20 | 0.64 | 105 | 3.40 | 0.18 | 98 | 23 | 46 | 7.70 | |
| | | 0.25 | 15 | 0.40 | 99 | 1.90 | 0.10 | 78 | 18 | 41 | 7.80 | |
| WAT | Kleinspruit @ Secunda 26°33'9.73"S 29° 4'58.31"E | 0.47 | 33 | 0.41 | 120 | 3.30 | 0.67 | 89 | 32 | 55 | 7.40 | |
| | | 0.72 | 48 | 0.46 | 140 | 4.90 | 0.21 | 215 | 30 | 86 | 7.80 | |
| | | 0.62 | 38 | 0.56 | 140 | 2.40 | 0.20 | 105 | 26 | 58 | 7.80 | |
| | | 0.65 | 20 | 0.48 | 130 | 2.20 | 0.20 | 53 | 26 | 56 | 7.50 | |
| WAR | Waterval River @ Roodebank 26°37'44.10"S 29° 1'32.31"E | 3.10 | 33 | 0.44 | 125 | 2.10 | 0.85 | 105 | 44 | 54 | 7.50 | |
| | | 0.84 | 11 | 0.32 | 110 | 0.88 | 0.24 | 23 | 35 | 49 | 7.60 | |
| | | 4.20 | 63 | 0.52 | 190 | 1.20 | 1.00 | 100 | 38 | 73 | 7.50 | |
| | | 7.90 | 63 | 0.61 | 190 | 9.20 | 1.50 | 95 | 34 | 74 | 7.90 | |
| WAE | Waterval River @ Elandslaagte 26°51'30.04"S 28°53'23.52"E | 0.20 | 30 | 0.39 | 115 | 1.50 | 0.53 | 55 | 39 | 47 | 7.40 | |
| | | 0.22 | 25 | 0.44 | 100 | 0.64 | 0.17 | 58 | 38 | 43 | 7.70 | |
| | | 0.22 | 51 | 0.42 | 185 | 0.46 | 0.09 | 84 | 28 | 67 | 8.20 | |
| | | 1.60 | 59 | 0.48 | 185 | 2.00 | 0.88 | 80 | 29 | 69 | 8.40 | |
| S-EVAN_W | Evander Sewage Works 26°29'32.97"S 29° 6'54.97"E | 14.00 | 42 | 1.40 | 190 | 1.50 | 8.20 | 45 | 150 | 63 | 7.20 | 1,583,200 |
| | | 13.00 | 50 | 0.63 | 205 | 1.60 | 3.40 | 37 | 91 | 74 | 7.60 | 2,000,430 |
| | | 20.00 | 52 | 0.22 | 195 | 2.10 | 3.60 | 53 | 89 | 78 | 7.50 | 1,384,130 |
| | | 15.00 | 48 | 0.36 | 215 | 6.60 | 3.00 | 65 | 125 | 76 | 7.40 | 2,014,170 |
| S-SEC_LOC | Embalenhle Sewage Works 26°33'21.66"S 29° 4'16.66"E | 27.00 | 55 | 0.24 | 275 | 0.19 | 6.10 | 78 | 93 | 97 | 7.60 | 6,230 |
| | | 22.00 | 53 | 0.29 | 265 | 0.14 | 4.40 | 61 | 110 | 86 | 7.80 | 724,260 |
| | | 31.00 | 68 | 0.27 | 290 | 0.26 | 7.50 | 80 | 115 | 96 | 7.60 | 431,650 |
| | | 24.00 | 41 | 0.16 | 360 | 2.00 | 3.10 | 110 | 245 | 95 | 7.20 | 3,514,050 |
| S-SEC_SEW | Secunda Sewage Works* 26°32'21.04"S 29° 8'42.00"E | 0.48 | 49 | 0.32 | 140 | 2.20 | 0.15 | 120 | 28 | 68 | 7.40 | 2 |
| | | 0.20 | 46 | 0.31 | 165 | 3.20 | 0.78 | 74 | 32 | 66 | 7.80 | 160 |
| | | 0.62 | 62 | 0.30 | 135 | 3.50 | 0.18 | 84 | 38 | 64 | 7.40 | 1 |
| | | 1.30 | 48 | 0.20 | 105 | 6.80 | 0.31 | 74 | 28 | 59 | 7.50 | 0 |

*The above colour coding is as per the Waterval River Instream Water Quality Guideline and not Water Use License conditions for any mining/ industries.

| Sewage Works Compliance (where applicable) to General Standard (GN 1191 Oct 1999) | | | | | | | | | | | | |
|--|--|---------|----------|----------|--------------|---------|-----------|----------|------------------------|--------------|------|-----------|
| Sample Points | Sample Point Description | Ammonia | Chloride | Fluoride | M-Alkalinity | Nitrate | Phosphate | Sulphate | Chemical Oxygen Demand | Conductivity | pH | E. coli |
| S-EVAN_W | Evander Sewage Works 26°29'32.97"S 29° 6'54.97"E | 14.00 | 42 | 1.40 | 190 | 1.50 | 8.20 | 45 | 150 | 63 | 7.20 | 1,583,200 |
| | | 13.00 | 50 | 0.63 | 205 | 1.60 | 3.40 | 37 | 91 | 74 | 7.60 | 2,000,430 |
| | | 20.00 | 52 | 0.22 | 195 | 2.10 | 3.60 | 53 | 89 | 78 | 7.50 | 1,384,130 |
| | | 15.00 | 48 | 0.36 | 215 | 6.60 | 3.00 | 65 | 125 | 76 | 7.40 | 2,014,170 |
| S-SEC_LOC | Embalenhle Sewage Works 26°33'21.66"S 29° 4'16.66"E | 27.00 | 55 | 0.24 | 275 | 0.19 | 6.10 | 78 | 93 | 97 | 7.60 | 6,230 |
| | | 22.00 | 53 | 0.29 | 265 | 0.14 | 4.40 | 61 | 110 | 86 | 7.80 | 724,260 |
| | | 31.00 | 68 | 0.27 | 290 | 0.26 | 7.50 | 80 | 115 | 96 | 7.60 | 431,650 |
| | | 24.00 | 41 | 0.16 | 360 | 2.00 | 3.10 | 110 | 245 | 95 | 7.20 | 3,514,050 |
| * Applicable Water Quality Standards for final effluent discharge from Secunda Sewage Works (as per DWA licence) | | | | | | | | | | | | |
| S-SEC_SEW | Secunda Sewage Works* 26°32'21.04"S 29° 8'42.00"E | 0.48 | 49 | 0.32 | 140 | 2.20 | 0.15 | 120 | 28 | 68 | 7.40 | 2 |
| | | 0.20 | 46 | 0.31 | 165 | 3.20 | 0.78 | 74 | 32 | 66 | 7.80 | 160 |
| | | 0.62 | 62 | 0.30 | 135 | 3.50 | 0.18 | 84 | 38 | 64 | 7.40 | 1 |
| | | 1.30 | 48 | 0.20 | 105 | 6.80 | 0.31 | 74 | 28 | 59 | 7.50 | 0 |

Key

| | | | | |
|-----|------------------------|------|---|------------------------|
| WAB | Bossiespruit @ Secunda | 0.59 | - | 1 Oct 13 - 31 Dec 13 |
| | | 0.12 | - | 1 Jan 14 - 31 Mar 14 |
| | | 2.1 | - | 1 Apr 14 - 30 Jun 14 |
| | | 0.28 | - | 1 July 14 - 30 Sept 14 |

Water Quality Guidelines

| | | |
|--|---|-------------------------------|
| | - | Ideal |
| | - | Acceptable |
| | - | Tolerable |
| | - | Unacceptable |
| | - | No sample or result available |

| In-stream Water Quality Guidelines for the Waterval Catchment | | | | | |
|--|------------------------|----------------------------|------------------------------|--------------------------|--------------|
| Variables | Measured as | Ideal Catchment Background | Acceptable Management Target | Tolerable Interim Target | Unacceptable |
| Physical | | | | | |
| Conductivity | mS/m | < 10 | 10 - 30 | 30 - 45 | > 45 |
| pH | pH units | 6.5 - 8.5 | | | < 6.5; > 8.5 |
| Organic | | | | | |
| Chemical Oxygen Demand (COD) | mg/l | < 10 | 10 - 15 | 15 - 20 | > 20 |
| Macro Elements | | | | | |
| Ammonia (NH ₄) | mg/l | < 0.2 | 0.2 - 0.5 | 0.5 - 1.0 | > 1.0 |
| Chloride (Cl) | mg/l | < 25 | 25 - 50 | 50 - 75 | > 75 |
| Fluoride (F) | mg/l | < 0.05 | 0.05 - 0.20 | 0.2 - 0.4 | > 0.4 |
| Alkalinity | CaCO ₃ mg/l | < 40 | 40 - 75 | 75 - 120 | > 120 |
| Nitrate (NO ₃) | mg/l | < 0.1 | 0.1 - 0.2 | 0.2 - 0.3 | > 0.3 |
| Phosphate (PO ₄) | mg/l | < 0.05 | 0.05 - 0.25 | 0.25 - 0.50 | > 0.50 |
| Sulphate (SO ₄) | mg/l | < 20 | 20 - 45 | 45 - 70 | > 70 |
| Bacteriological | | | | | |
| Faecal coliforms | counts/100ml | <10 | 10 - 60 | 60 - 120 | > 120 |
| * Applicable Water Quality Standards for final effluent discharge from Secunda Sewage Works (as per DWA licence) | | | | | |
| Variable | Limit | | | | |
| pH | 5.5 - 9.5 | | | | |
| Electrical Conductivity | ≤70 mS/m | | | | |
| Chemical Oxygen Demand | ≤75 mg/l | | | | |
| Ammonia as N | ≤6 mg/l | | | | |
| Nitrate / Nitrite as Nitrogen | ≤15 mg/l | | | | |
| Orthophosphate as P | ≤10 mg/l | | | | |
| Fluoride | ≤1 mg/l | | | | |
| Faecal coliform units (FCU) | 0 per 100ml | | | | |

| Sewage Works Compliance to General Standard (GN 1191 Oct 1999) | | | | | |
|--|--------------|------------------------------|--------------|--|--|
| Variables | Measured as | Acceptable Management Target | Unacceptable | | |
| Physical | | | | | |
| Conductivity | mS/m | <150 | >=150 | | |
| pH | pH units | 5.5 - 9.5 | < 5.5; >9.5 | | |
| Organic | | | | | |
| Chemical Oxygen Demand (COD)** | mg/l | <75 | >=75 | | |
| Macro Elements | | | | | |
| Ammonia (NH ₄) | mg/l | <3 | >=3 | | |
| Fluoride (F) | mg/l | <1 | >=1 | | |
| Nitrate (NO ₃) | mg/l | <15 | >=15 | | |
| Phosphate (PO ₄) | mg/l | <10 | >10 | | |
| Bacteriological | | | | | |
| Faecal coliforms | counts/100ml | <1000 | >=1000 | | |
| ** After removal of algae | | | | | |