

SWARTLAND MUNICIPALITY: COMPLIANCE SAMPLE RESULTS OF FINAL EFFLUENT FOR 2015-2016

|                              | WWTW            | Jul-15  | Aug-15  | Sep-15  | Oct-15  | Nov-15  | Dec-15  | Jan-16  | Feb-16  | Mar-16  | Apr-16  | May-16  | Jun-16  | No of Samples | No of Samples Complying | % Compliance | Requirement                            |
|------------------------------|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------------|-------------------------|--------------|--|
| pH                           | Malmesbury      | 7.04    | 7.13    | 6.74    | 6.68    | 6.82    | 7.42    | 7.65    | 6.68    | 7.25    | 7.00    | 7.10    | 7.66    | 12            | 12                      | 100.0%       | 5.5 - 9.5 General Limit                |
|                              | Darling         | 7.35    | 7.25    | 7.37    | 7.33    | 7.82    | 7.50    | 7.51    | 7.19    | 7.01    | 6.99    | 7.75    | 7.24    | 12            | 12                      | 100.0%       | 5.5 - 9.5 General Limit                |
|                              | Moorreesburg    | 7.83    | 8.03    | 7.97    | 7.32    | 7.68    | 7.65    | 7.92    | 7.44    | 7.36    | 7.75    | 7.31    | 7.72    | 12            | 12                      | 100.0%       | 5.5 - 9.5 General Limit                |
|                              | PPC             | 5.73    | 5.07    | 5.24    | 5.48    | 6.99    | 5.98    | 7.62    | 6.64    | 5.79    |         |         |         | 9             | 6                       | 66.7%        | 5.5 - 9.5 General Limit                |
|                              | Koringberg      | 7.28    | 7.93    | 7.27    | 7.17    | 7.24    | 7.01    | 7.81    | 7.10    | 7.17    | 7.48    | 6.99    | 7.20    | 12            | 12                      | 100.0%       | 5.5 - 9.5 General Limit                |
|                              | Chatsworth      | 6.87    | 7.12    | 6.94    | 7.06    | 7.10    | 7.06    | 8.11    | 7.86    | 7.99    | 6.92    | 6.60    | 6.85    | 12            | 12                      | 100.0%       | 5.5 - 9.5 General Limit                |
|                              | Kalbaskraal     | 6.57    | 7.33    | 6.77    | 7.10    | 7.12    | 6.43    | 7.58    | 7.54    | 6.99    | 7.12    | 6.96    | 6.74    | 12            | 12                      | 100.0%       | 6 - 9 for irrigation up to 0.5 M/d     |
|                              | Riebeek Kasteel | 6.82    | 7.09    |         | 7.69    |         |         |         |         |         |         |         |         | 3             | 3                       | 100.0%       | 6 - 9 for irrigation up to 0.5 M/d     |
|                              | Riebeek Wes     | 6.63    | 7.15    | 6.78    | 7.05    |         |         |         |         |         |         |         |         | 4             | 4                       | 100.0%       | 6 - 9 for irrigation up to 0.5 M/d     |
|                              | Riebeek Valley  |         |         |         |         |         |         | 7.54    | 7.80    | 6.59    | 7.06    | 7.10    | 7.12    | 6             | 6                       | 100.0%       | 5.5 - 9.5 General Limit                |
| COD (mg/l)                   | Malmesbury      | 11.60   | 26.60   | 30.60   | 24.50   | 21.60   | 34.20   | 20.00   | 30.30   | 28.90   | 21.50   | 38.10   | 21.00   | 12            | 12                      | 100.0%       | 75 General Limit                       |
|                              | Darling         | 25.60   | 35.20   | 53.10   | 33.10   | 22.40   | 33.80   | 18.80   | 31.10   | 30.50   | 28.60   | 52.20   | 32.20   | 12            | 12                      | 100.0%       | 75 General Limit                       |
|                              | Moorreesburg    | 30.80   | 60.30   | 54.70   | 62.40   | 49.70   | 61.50   | 70.90   | 106.00  | 103.00  | 76.80   | 61.90   | 46.10   | 12            | 9                       | 75.0%        | 75 General Limit                       |
|                              | PPC             | 29.10   | 57.70   | 49.40   | 16.70   | 20.80   | 71.20   | 72.50   | 35.00   | 17.80   |         |         |         | 9             | 9                       | 100.0%       | 75 General Limit                       |
|                              | Koringberg      | 446.00  | 364.00  | 582.00  | 473.00  | 623.00  | 386.00  | 719.00  | 961.00  | 596.00  | 660.00  | 470.00  | 672.00  | 12            | 0                       | 0.0%         | 75 General Limit                       |
|                              | Chatsworth      | 166.00  | 208.00  | 255.00  | 147.00  | 135.00  | 149.00  | 138.00  | 148.00  | 124.00  | 106.00  | 158.00  | 192.00  | 12            | 0                       | 0.0%         | 75 General Limit                       |
|                              | Kalbaskraal     | 191.00  | 298.00  | 162.00  | 309.00  | 452.00  | 712.00  | 548.00  | 571.00  | 590.00  | 576.00  | 512.00  | 568.00  | 12            | 4                       | 33.3%        | 400 for irrigation up to 0.5 M/d       |
|                              | Riebeek Kasteel | 295.00  | 146.00  |         | 130.00  |         |         |         |         |         |         |         |         | 3             | 3                       | 100.0%       | 400 for irrigation up to 0.5 M/d       |
|                              | Riebeek Wes     | 222.00  | 150.00  | 217.00  | 240.00  |         |         |         |         |         |         |         |         | 4             | 4                       | 100.0%       | 400 for irrigation up to 0.5 M/d       |
|                              | Riebeek Valley  |         |         |         |         |         |         | 33.30   | 46.30   | 65.50   | 83.70   | 39.70   | 31.60   | 6             | 5                       | 83.3%        | 75 General Limit                       |
| TSS (mg/l)                   | Malmesbury      | 6.00    | 4.00    | 5.00    | 4.00    | 4.00    | 4.00    | 4.00    | 4.00    | 12.00   | 4.00    | 16.00   | 4.00    | 12            | 12                      | 100.0%       | 25 General Limit                       |
|                              | Darling         | 316.00  | 44.00   | 88.00   | 13.00   | 10.00   | 5.00    | 10.00   | 4.00    | 32.00   | 41.00   | 14.00   | 9.00    | 12            | 7                       | 58.3%        | 25 General Limit                       |
|                              | Moorreesburg    | 56.00   | 4.00    | 9.00    | 10.00   | 4.00    | 5.00    | 5.00    | 18.00   | 6.00    | 4.00    | 11.00   | 5.00    | 12            | 11                      | 91.7%        | 25 General Limit                       |
|                              | PPC             | 12.00   | 30.00   | 46.00   | 60.00   | 20.00   | 14.00   | 24.00   | 4.00    | 8.00    |         |         |         | 9             | 6                       | 66.7%        | 25 General Limit                       |
|                              | Koringberg      | 280.00  | 160.00  | 528.00  | 22.00   | 351.00  | 342.00  | 71.00   | 1400.00 | 69.00   | 462.00  | 280.00  | 840.00  | 12            | 1                       | 8.3%         | 25 General Limit                       |
|                              | Chatsworth      | 48.00   | 108.00  | 211.00  | 40.00   | 22.00   | 69.00   | 26.00   | 86.00   | 26.00   | 14.00   | 38.00   | 113.00  | 12            | 2                       | 16.7%        | 25 General Limit                       |
|                              | Kalbaskraal     | 26.00   | 86.00   | 63.00   | 58.00   | 359.00  | 473.00  | 34.00   | 285.00  | 21.00   | 121.00  | 124.00  | 693.00  | 12            | 1                       | 8.3%         | N/A for irrigation up to 0.5 M/d       |
|                              | Riebeek Kasteel | 80.00   | 78.00   |         | 24.00   |         |         |         |         |         |         |         |         | 3             | 1                       | 33.3%        | N/A for irrigation up to 0.5 M/d       |
|                              | Riebeek Wes     | 90.00   | 70.00   | 164.00  | 36.00   |         |         |         |         |         |         |         |         | 4             | 0                       | 0.0%         | N/A for irrigation up to 0.5 M/d       |
|                              | Riebeek Valley  |         |         |         |         |         |         | 4.00    | 8.00    | 7.00    | 26.00   | 6.00    | 12.00   | 6             | 5                       | 83.3%        | 25 General Limit                       |
| Ammonia (mg/l)               | Malmesbury      | 5.90    | 9.30    | 0.96    | 1.30    | 3.50    | 30.60   | 0.35    | 5.00    | 0.26    | 4.50    | 0.10    | 0.10    | 12            | 10                      | 83.3%        | 6 General Limit                        |
|                              | Darling         | 2.50    | 0.41    | 2.50    | 0.10    | 1.60    | 0.17    | 0.20    | 0.10    | 2.20    | 0.21    | 0.10    | 0.78    | 12            | 12                      | 100.0%       | 6 General Limit                        |
|                              | Moorreesburg    | 14.80   | 33.60   | 13.50   | 11.70   | 16.40   | 24.20   | 20.30   | 48.70   | 53.90   | 57.90   | 11.00   | 15.60   | 12            | 0                       | 0.0%         | 6 General Limit                        |
|                              | PPC             | 1.20    | 3.80    | 10.70   | 1.30    | 0.37    | 8.10    | 24.80   | 3.80    | 1.20    |         |         |         | 9             | 6                       | 66.7%        | 6 General Limit                        |
|                              | Koringberg      | 97.40   | 93.10   | 128.00  | 85.80   | 72.60   | 94.10   | 67.70   | 56.60   | 65.40   | 93.50   | 24.90   | 86.20   | 12            | 0                       | 0.0%         | 6 General Limit                        |
|                              | Chatsworth      | 67.80   | 49.10   | 72.20   | 86.20   | 41.60   | 17.20   | 8.80    | 9.10    | 8.10    | 35.40   | 9.40    | 64.20   | 12            | 0                       | 0.0%         | 6 General Limit                        |
|                              | Kalbaskraal     | 30.20   | 54.30   | 42.40   | 54.70   | 40.30   | 27.50   | 27.10   | 27.90   | 31.90   | 39.00   | 7.30    | 28.20   | 12            | 0                       | 0.0%         | N/A for irrigation up to 0.5 M/d       |
|                              | Riebeek Kasteel | 63.10   | 26.70   |         | 38.50   |         |         |         |         |         |         |         |         | 3             | 0                       | 0.0%         | N/A for irrigation up to 0.5 M/d       |
|                              | Riebeek Wes     | 73.00   | 53.60   | 54.30   | 71.20   |         |         |         |         |         |         |         |         | 4             | 0                       | 0.0%         | N/A for irrigation up to 0.5 M/d       |
|                              | Riebeek Valley  |         |         |         |         |         |         | 0.10    | 2.40    | 18.10   | 7.30    | 0.33    | 0.14    | 6             | 4                       | 66.7%        | 6 General Limit                        |
| Faecal Coliforms (org/100ml) | Malmesbury      | 2.00    | 5.00    | 12.00   | 1.00    | 1.00    | 60.00   | 16.00   | 9.00    | 17.00   | 12.00   | 4.00    | 4.00    | 12            | 12                      | 100.0%       | 1 000 General Limit                    |
|                              | Darling         | 2419.00 | 231.00  | 2419.00 | 291.00  | 131.00  | 29.00   | 45.00   | 20.00   | 2419.00 | 4.00    | 1.00    | 601.00  | 12            | 9                       | 75.0%        | 1 000 General Limit                    |
|                              | Moorreesburg    | 1300.00 | 2419.00 | 148.00  | 93.00   | 32.00   | 2419.00 | 2419.00 | 2419.00 | 236.00  | 2419.00 | 22.00   | 5.00    | 12            | 6                       | 50.0%        | 1 000 General Limit                    |
|                              | PPC             | 49.00   | 1.00    | 2419.00 | 2419.00 | 866.00  | 2419.00 | 2419.00 | 22.00   | 2.00    |         |         |         | 9             | 5                       | 55.6%        | 1 000 General Limit                    |
|                              | Koringberg      | 2419.00 | 2419.00 | 2419.00 | 2419.00 | 2419.00 | 4.00    | 2419.00 | 2419.00 | 2419.00 | 2419.00 | 2419.00 | 2419.00 | 12            | 1                       | 8.3%         | 1 000 General Limit                    |
|                              | Chatsworth      | 2419.00 | 2419.00 | 649.00  | 22.00   | 98.00   | 2419.00 | 1011.00 | 2419.00 | 2419.00 | 68.00   | 2419.00 | 93.00   | 12            | 5                       | 41.7%        | 1 000 General Limit                    |
|                              | Kalbaskraal     | 135.00  | 2419.00 | 79.00   | 2419.00 | 2419.00 | 2419.00 | 1011.00 | 2419.00 | 2419.00 | 2419.00 | 2419.00 | 2419.00 | 12            | 12                      | 100.0%       | < 100 000 for irrigation up to 0.5 M/d |
|                              | Riebeek Kasteel | 2419.00 | 2419.00 |         | 2419.00 |         |         |         |         |         |         |         |         | 3             | 3                       | 100.0%       | < 100 000 for irrigation up to 0.5 M/d |
|                              | Riebeek Wes     | 2419.00 | 2419.00 | 2419.00 | 1011.00 |         |         |         |         |         |         |         |         | 4             | 4                       | 100.0%       | < 100 000 for irrigation up to 0.5 M/d |
|                              | Riebeek Valley  |         |         |         |         |         |         | 435.00  | 2419.00 | 158.00  | 1.00    | 1.00    | 1.00    | 6             | 5                       | 83.3%        | 1 000 General Limit                    |
| Conductivity                 | Malmesbury      | 122.00  | 118.00  | 128.00  | 133.00  | 121.00  | 159.00  | 131.00  | 133.00  | 128.00  | 109.00  | 124.00  | 156.00  | 12            | 10                      | 83.3%        | Max 150 General Limit                  |
|                              | Darling         | 81.50   | 76.50   | 88.00   | 89.50   | 98.00   | 104.00  | 84.00   | 135.00  | 117.00  | 103.00  | 102.00  | 99.50   | 12            | 12                      | 100.0%       | Max 150 General Limit                  |
|                              | Moorreesburg    | 115.00  | 156.00  | 172.00  | 164.00  | 145.00  | 155.00  | 145.00  | 145.00  | 153.00  | 140.00  | 129.00  | 133.00  | 12            | 7                       | 58.3%        | Max 150 General Limit                  |
|                              | PPC             | 30.50   | 58.00   | 42.50   | 46.00   | 43.00   | 51.50   | 82.50   | 106.00  | 125.00  |         |         |         | 9             | 9                       | 100.0%       | Max 150 General Limit                  |
|                              | Koringberg      | 148.00  | 181.00  | 210.00  | 0.24    | 230.00  | 285.00  | 210.00  | 240.00  | 194.00  | 180.00  | 195.00  | 189.00  | 12            | 2                       | 16.7%        | Max 150 General Limit                  |
|                              | Chatsworth      | 130.00  | 134.00  | 132.00  | 160.00  | 134.00  | 150.00  | 139.00  | 174.00  | 151.00  | 150.00  | 152.00  | 136.00  | 12            | 8                       | 66.7%        | Max 150 General Limit                  |
|                              | Kalbaskraal     | 133.00  | 132.00  | 126.00  | 146.00  | 153.00  | 163.00  | 186.00  | 255.00  | 260.00  | 206.00  | 198.00  | 140.00  | 12            | 9                       | 75.0%        | 200 for irrigation up to 0.5 M/d       |
|                              | Riebeek Kasteel | 134.00  | 108.00  |         | 146.00  |         |         |         |         |         |         |         |         | 3             | 3                       | 100.0%       | 200 for irrigation up to 0.5 M/d       |
|                              | Riebeek Wes     | 130.00  | 122.00  | 137.00  | 157.00  |         |         |         |         |         |         |         |         | 4             | 4                       | 100.0%       | 200 for irrigation up to 0.5 M/d       |
|                              | Riebeek Valley  |         |         |         |         |         |         | 74.50   | 92.00   | 101.00  | 105.00  | 88.50   | 83.00   | 6             | 6                       | 100.0%       | Max 150 General Limit                  |
| Nitrate Nitrogen             | Malmesbury      | 5.30    | 4.30    | 9.50    | 15.90   | 9.80    | 0.20    | 8.80    | 12.30   | 14.30   | 9.50    | 7.40    | 1.70    | 12            | 11                      | 91.7%        | 15 General Limit                       |
|                              | Darling         | 3.10    | 0.28    | 0.20    | 2.70    | 0.46    | 1.30    | 3.70    | 1.30    | 1.20    | 3.60    | 2.30    | 0.88    | 12            | 12                      | 100.0%       | 15 General Limit                       |
|                              | Moorreesburg    | 20.90   | 1.50    | 17.30   | 13.00   | 6.30    | 0.20    | 0.44    | 0.20    | 0.20    | 6.90    | 11.80   | 11.60   | 12            | 10                      | 83.3%        | 15 General Limit                       |
|                              | PPC             | 10.00   | 23.00   | 16.20   | 17.00   | 16.60   | 4.80    | 1.80    | 14.40   | 15.10   |         |         |         | 9             | 4                       | 44.4%        | 15 General Limit                       |
|                              | Koringberg      | 0.52    | 0.20    | 0.20    | 0.20    | 0.20    | 0.20    | 0.20    | 0.20    | 0.20    | 0.20    | 0.20    | 0.20    | 12            | 12                      | 100.0%       | 15 General Limit                       |
|                              | Chatsworth      | 0.24    | 0.20    | 0.20    | 0.20    | 0.20    | 0.21    | 0.20    | 2.90    | 0.20    | 0.20    | 0.20    | 0.20    | 12            | 12                      | 100.0%       | 15 General Limit                       |
|                              | Kalbaskraal     | 9.80    | 0.20    | 7.50    | 0.20    | 0.36    | 0.20    | 0.20    | 0.20    | 0.20    | 0.20    | 0.81    | 0.56    | 12            | 12                      | 100.0%       | N/A for irrigation up to 0.5 M/d       |
|                              | Riebeek Kasteel | 0.30    | 0.20    |         | 0.20    |         |         |         |         |         |         |         |         | 3             | 3                       | 100.0%       | N/A for irrigation up to 0.5 M/d       |
|                              | Riebeek Wes     | 0.29    | 0.20    | 5.40    | 0.20    |         |         |         |         |         |         |         |         | 4             | 4                       | 100.0%       | N/A for irrigation up to 0.5 M/d       |
|                              | Riebeek Valley  |         |         |         |         |         |         | 4.50    | 1.60    | 1.10    | 1.60    | 4.30    | 1.30    | 6             | 6                       |              |  |

**Table C4.2.6: Percentage chemical compliance of the compliance samples taken at the various WWTWs**

| WWTW           | Number of Compliance Samples Taken |                     |           |                 |              | Number of Samples Complying with General Standards |           |                 |              |                     | Percentage Compliance |                 |              |  |  |
|----------------|------------------------------------|---------------------|-----------|-----------------|--------------|--|-----------|-----------------|--------------|---------------------|-----------------------|-----------------|--------------|--|--|
|                | Ammonia                            | Nitrites & Nitrates | COD       | Ortho-Phosphate | Ammonia      | Nitrites & Nitrates                                | COD       | Ortho-Phosphate | Ammonia      | Nitrites & Nitrates | COD                   | Ortho-Phosphate | Overall      |  |  |
| Malmesbury     | 12                                 | 12                  | 12        | 12              | 10.00        | 11   | 12        | 12              | 83.3%        | 91.7%               | 100.0%                | 100.0%          | 93.8%        |  |  |
| Darling        | 12                                 | 12                  | 12        | 12              | 12.00        | 12   | 12        | 11              | 100.0%       | 100.0%              | 100.0%                | 91.7%           | 97.9%        |  |  |
| Moorreesburg   | 12                                 | 12                  | 12        | 12              | 0.00         | 10   | 9         | 8               | 0.0%         | 83.3%               | 75.0%                 | 66.7%           | 56.3%        |  |  |
| Koringberg     | 12                                 | 12                  | 12        | 12              | 0.00         | 12   | 0         | 2               | 0.0%         | 100.0%              | 0.0%                  | 16.7%           | 29.2%        |  |  |
| Chatsworth     | 12                                 | 12                  | 12        | 12              | 0.00         | 12   | 0         | 7               | 0.0%         | 100.0%              | 0.0%                  | 58.3%           | 39.6%        |  |  |
| Kalbaskraal    | 12                                 | 12                  | 12        | 12              |              |  | 4         |                 |              |                     | 33.3%                 |                 | 33.3%        |  |  |
| Riebeek Valley | 6                                  | 6                   | 6         | 6               | 4.00         | 6  | 5         | 3               | 66.7%        | 100.0%              | 83.3%                 | 50.0%           | 75.0%        |  |  |
| <b>Total</b>   | <b>66</b>                          | <b>66</b>           | <b>78</b> | <b>66</b>       | <b>26.00</b> | <b>63</b>  | <b>42</b> | <b>43</b>       | <b>39.4%</b> | <b>95.5%</b>        | <b>53.8%</b>          | <b>65.2%</b>    | <b>63.0%</b> |  |  |

**Table C4.2.7: Percentage physical compliance of the compliance samples taken at the various WWTWs**

| WWTW           | Number of Compliance Samples Taken |                         |                  |           |                         | Number of Samples Complying with General Standards |               |                         |                  |              | Percentage Compliance |  |  |  |  |
|----------------|------------------------------------|-------------------------|------------------|-----------|-------------------------|--|---------------|-------------------------|------------------|--------------|-----------------------|--|--|--|--|
|                | pH                                 | Electrical Conductivity | Suspended Solids | pH        | Electrical Conductivity | Suspended Solids                                   | pH            | Electrical Conductivity | Suspended Solids | Overall      |                       |  |  |  |  |
| Malmesbury     | 12                                 | 12                      | 12               | 12        | 10                      | 12   | 100.0%        | 83.3%                   | 100.0%           | 94.4%        |                       |  |  |  |  |
| Darling        | 12                                 | 12                      | 12               | 12        | 12                      | 7  | 100.0%        | 100.0%                  | 58.3%            | 86.1%        |                       |  |  |  |  |
| Moorreesburg   | 12                                 | 12                      | 12               | 12        | 7                       | 11   | 100.0%        | 58.3%                   | 91.7%            | 83.3%        |                       |  |  |  |  |
| Koringberg     | 12                                 | 12                      | 12               | 12        | 2                       | 1  | 100.0%        | 16.7%                   | 8.3%             | 41.7%        |                       |  |  |  |  |
| Chatsworth     | 12                                 | 12                      | 12               | 12        | 8                       | 2  | 100.0%        | 66.7%                   | 16.7%            | 61.1%        |                       |  |  |  |  |
| Kalbaskraal    | 12                                 | 12                      | 12               | 12        | 9                       |  | 100.0%        | 75.0%                   |                  | 87.5%        |                       |  |  |  |  |
| Riebeek Valley | 6                                  | 6                       | 6                | 6         | 6                       | 5  | 100.0%        | 100.0%                  | 83.3%            | 94.4%        |                       |  |  |  |  |
| <b>Total</b>   | <b>78</b>                          | <b>78</b>               | <b>66</b>        | <b>78</b> | <b>54</b>               | <b>38</b>  | <b>100.0%</b> | <b>69.2%</b>            | <b>57.6%</b>     | <b>76.6%</b> |                       |  |  |  |  |

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