Lumentum – Caswell

Water Quality Assessment

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Water Quality Assessment
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1 Introduction & Background

1.1 Tetra Tech RPS was commissioned to undertake an H1 screening assessment including a D2 assessment for the discharge of process effluent from Caswell Science and Technology Park, Caswell, Towcester, Northamptonshire, NN12 8EQ, to a surface watercourse. The site plan is displayed in Figure 1.

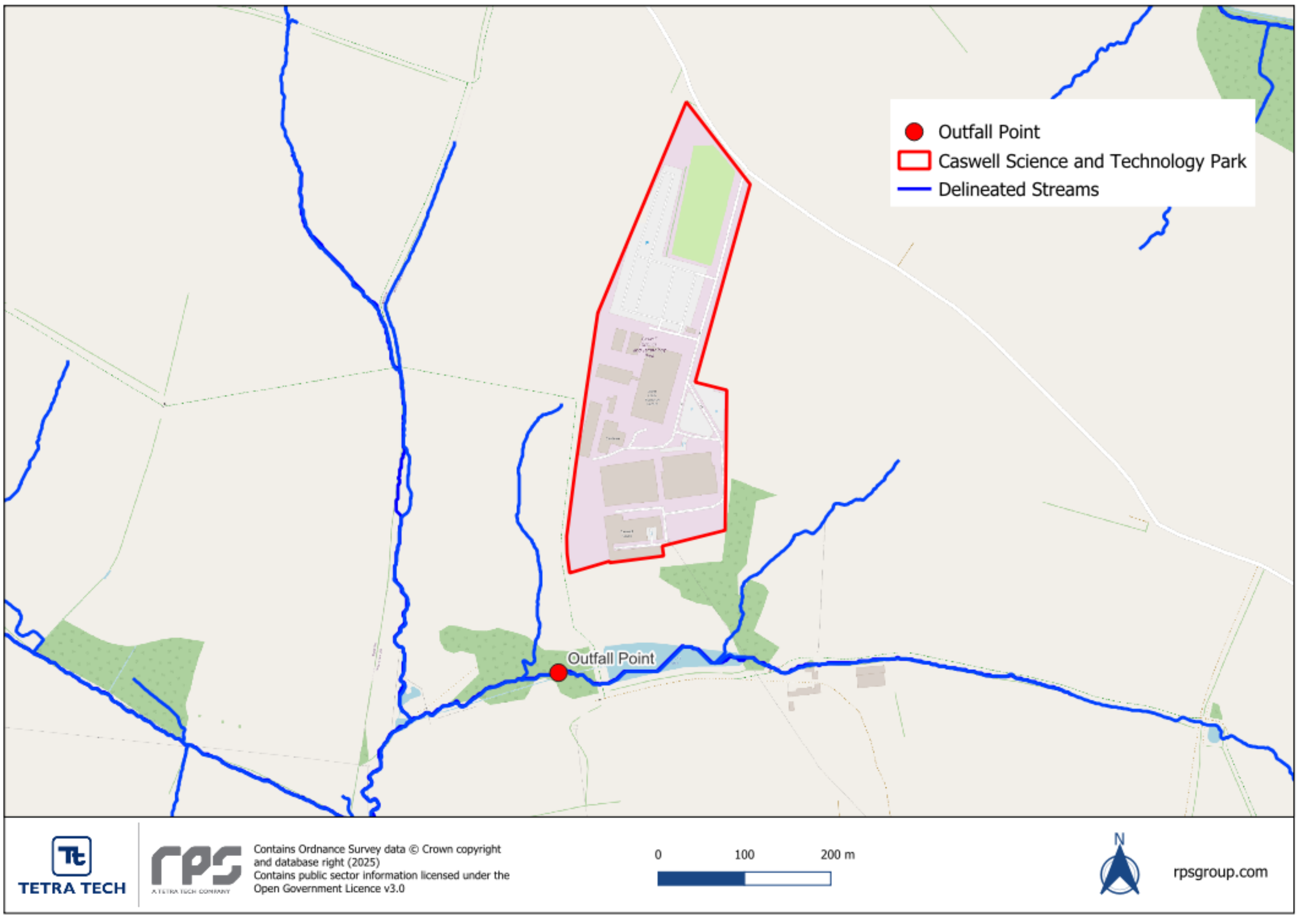


Figure 1. Site Plan.

1.2 The aim of this report is to present the effect of the discharge from the Lumentum permitted site on the receiving watercourses, Caswell Stream, Caswell Brook, Blakesley Brook, and the River Tove. For the purposes of this report, Caswell Stream refers to the unnamed watercourse to the south of the site, shown in Figure 2. The assessment has been prepared to support a permit application to allow changes to Lumentum's permitted activities which include an increase in the over volume of waste waters produced from the site.

1.3 Following on-site treatment, the discharge is routed to the nearby Caswell Stream, which is part of the Blakesley Brook Water Framework Directive (WFD) Water Body, a tributary of the River Tove. The local watercourse network is shown in Figure 2.

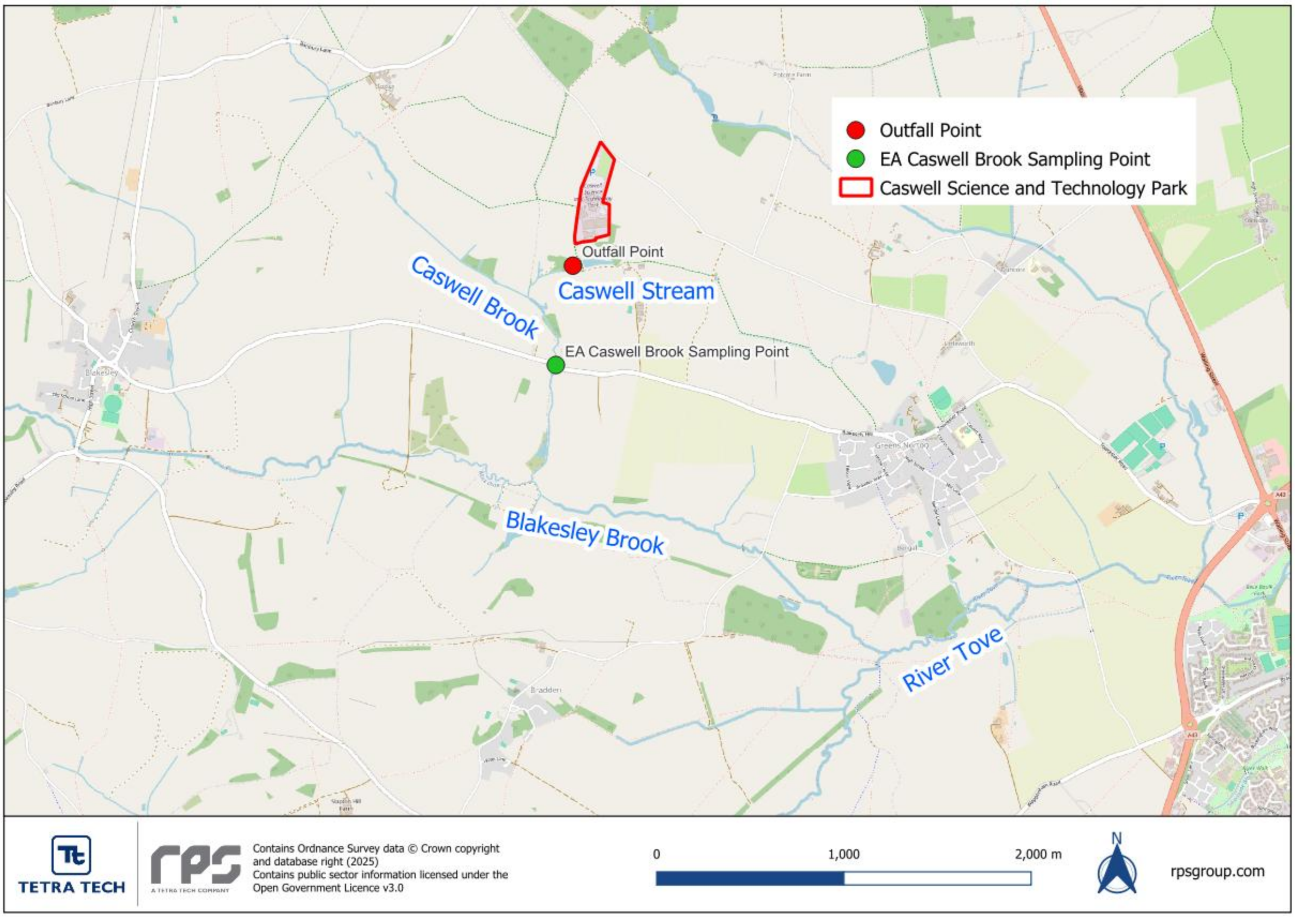


Figure 2. Local Watercourse Network.

1.4 The discharge at the site includes sanitary pollutants, specific pollutants, and priority hazardous substances, such as lead and zinc. Whilst the changes are expected to increase the volume of the discharges the composition of the effluent is not expected to significantly change from that currently discharged. A D2 assessment to assess the impacts of the sanitary pollutants will therefore be required, in addition to the regular H1 screening assessment, using the updated Environment Agency tool.

1.5 Analytes which fail H1 screening will require further modelling through Monte Carlo simulations, this has been performed using the River Quality Planning (RQP)'s Monte Carlo function. Some of the metals in the discharge are subject to standards based on the concentration of their bioavailable fraction, so will require modelling using RQP's Metals Permitting (MPER) tool, where they fail regular H1 screening.

1.6 This desk study was undertaken by reference to information provided / published by the EA and Ordnance Survey (OS).

Assessment Points

1.7 The Local Environment Agency Site Inspector, Duncan Beaumont attended the Lumentum site on 24 September 2025 to discuss the permit variation. In relation to this assessment the EA requested four assessment points to be considered. These points included the point of the immediate discharge into Caswell Stream and three downstream locations. The locations of these points are shown in Figure 3, with their grid references displayed in Table 1.

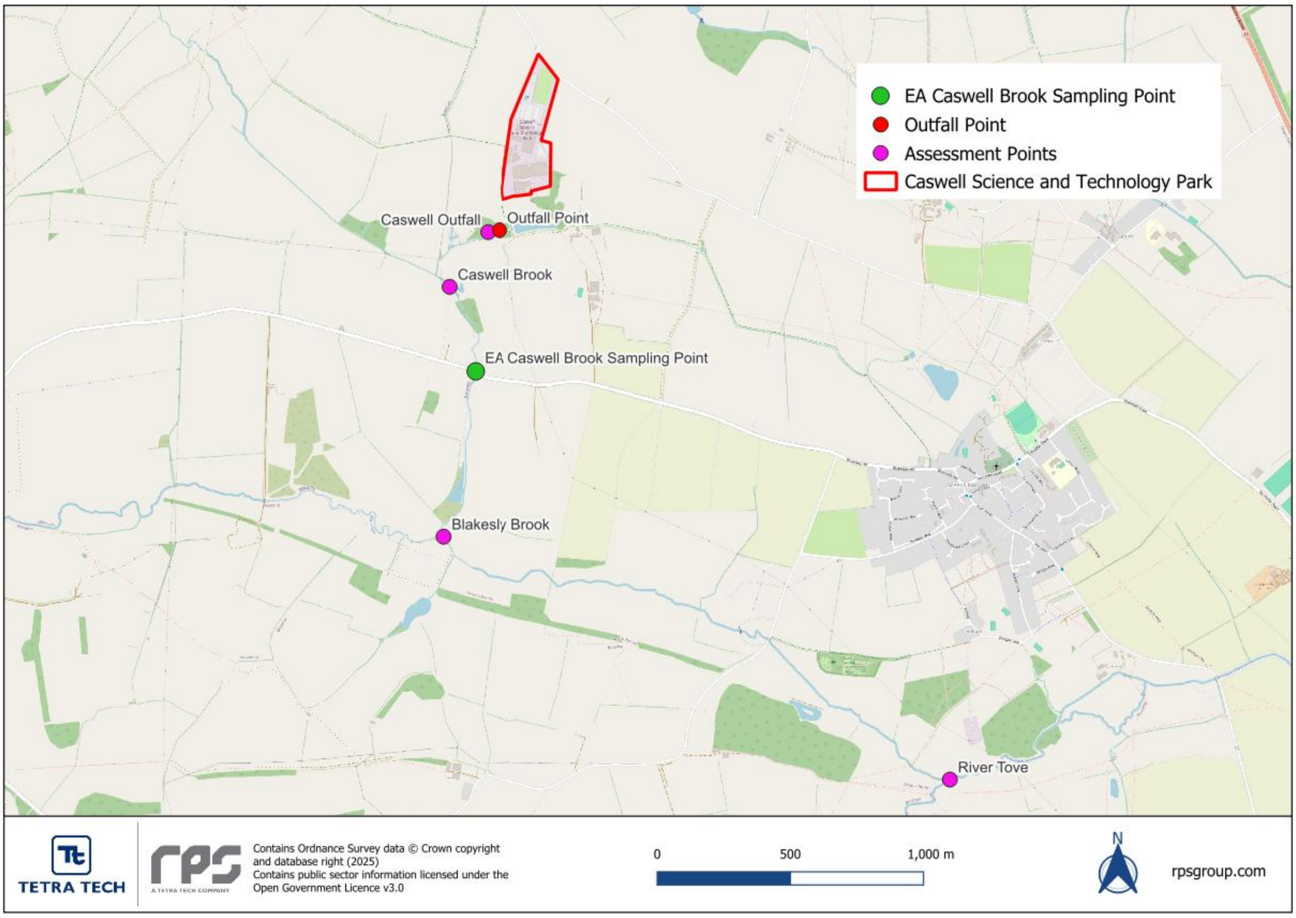


Figure 3. Assessment Points.

Table 1. Grid Reference of Assessment Points.

Name	Grid Reference
Caswell Outfall	SP 64997 50782
Caswell Brook	SP 64852 50576
Blakesley Brook	SP 64829 49638
River Tove	SP 66735 48726

2 Policy Context

H1 Water Quality Assessment

2.1 Applications to discharge effluent to watercourses that contains chemicals designated as "specific pollutants" or "priority hazardous substances" are generally risk-assessed using the EA's H1 tool.

2.2 Under the H1 process, progressively more detailed screening tests are undertaken using data regarding the chemistry and flow of the effluent and receiving watercourse. Where chemicals in the effluent "pass" the screening tests, they are not considered a risk to the environment and no further assessment is required.

2.3 Priority hazardous substances are subject to an additional screening test to calculate whether the annual loading (the total mass of a substance entering a receiving watercourse), rather than concentration poses a risk to the environment.

2.4 Where chemicals in the effluent "fail" the screening tests, more detailed chemical modelling is required. Monte Carlo modelling is used to quantify the effect of discharges on the chemistry of receiving watercourses, this is undertaken using the EA's River Quality Planning (RQP) tool.

2.5 For metals where only a portion of the concentration in the receiving watercourse will be "biologically available" such as zinc, copper and lead, the Metals Permitting Tool (M-PER) within RQP can be used to understand the bio-available concentration of certain metals within a receiving watercourse downstream of a discharge.

2.6 Specific pollutants and priority hazardous substances are assessed against the Environmental Quality Standards (EQSs). An EQS may be set for the annual mean (AA) concentration of a substance, maximum concentration (MAC) or both.

H1 D2 Assessments

2.7 The H1 Annex D2 'Assessment of sanitary and other pollutants within Surface Water Discharges' provides guidance for assessing impact of effluent discharges on surface watercourses.

2.8 In accordance with the guidance from the H1 Annex D2 the report will calculate the deterioration effects of the current discharge.

2.9 The H1 Annex D2 determines that a discharge is typically acceptable if it does not cause deterioration in quality of the water body receiving the discharge.

2.10 The ideal, outlined in the H1 Annex D2, is no increase of overall polluting load for each element. Where this is not feasible/cost-effective, a deterioration of no more than 10% of the mean/90-percentile may be allowed, as long as deterioration is not beyond the WFD class boundary.

2.11 The H1 Annex D2 Appendix C details the river classifications to which environmental standards apply. Appendix D of H1 Annex D2 details the environmental standards. These standards are quoted in Section 3 of the note

2.12 The H1 Annex D2 Appendix A gives detailed guidance on calculating deterioration of the receiving watercourse. It states that Monte Carlo simulations should be used to calculate the impact on water quality of the new discharge. This is discussed further in Section 6.

3 Water Framework Directive Standards

3.1 The parameters of concern to the EA when assessing the impact of sanitary discharges are 'those that form the basis of the physico-chemical water quality classification scheme of the WFD. These are ammoniacal nitrogen, phosphorus, and biochemical oxygen demand (BOD)'.

3.2 The environmental standards depend on the type of river. Following the criteria in Appendix C of the H1 D2 Annex; Caswell Stream, Caswell Brook, Blakesley Brook, and River Tove are:

- Type 7 under the types detailed in Table 2 and Table 3.
- Type 4n under the types detailed in Table 4.

3.3 The elevation at all four points is above 80m AOD in altitude, as determined by LiDAR data[1]. The mean alkalinity as CaCO3 was also above 200mg/l for all points according to EA data[2], therefore the same environmental standards apply to all four points. The River Tove was identified as being Salmonoid using the EA Salmonid Main Rivers Map[3].

3.4 Tables 2, 3, and 4 are from the H1 Annex D2, Appendix D[4] and show the standards for Biochemical Oxygen Demand (BOD), Ammonia and Phosphorus. The relevant standards that apply to Caswell Stream are in bold.

3.5 The standards for Acid Conditions (pH), also from H1 Annex D2, Appendix D, are shown in Table 5. These apply to all rivers regardless of chemical type.

Table 2. BOD Standards

Biochemical Oxygen Demand (mg/l)				
(90 – percentile)				
Type	High	Good	Moderate	Poor
1, 2, 4, 6, and Salmonoid	**3**	**4**	**6**	**7.5**
3, 5, and 7	4	5	6.5	9

Table 3. Total Ammonia as N Standards

Total Ammonia as Nitrogen (mg/l)				
(90 – percentile)				
Type	High	Good	Moderate	Poor
1, 2, 4, and 6	0.2	0.3	0.75	1.1
3, 5, and 7	**0.3**	**0.6**	**1.1**	**2.5**

[1] Defra Survey Data Download – accessed November 2025
[2] Open WIMS data – accessed November 2025
[3] LIT10363_Salmonid_main_rivers_map.pdf - accessed November 2025
[4] 1076_14 H1 Annex D2 - Assessment of sanitary and other pollutants within Surface Water Discharges

Table 4. Reactive P Standards

Reactive Phosphorous Standards (µg/l)				
Annual means				
Type	High	Good	Moderate	Poor
1n	30	50	150	500
2n	20	40	150	500
3n and 4n	**50**	**120**	**250**	**1000**

Table 5. Acid Conditions (pH) Standards

Acid Conditions (pH) Standards	
High	Good
pH as 5th Percentile >6 **AND** pH as 95th Percentile <9	pH as 10th Percentile >5.2

4 Receiving Waterbodies

4.1 The discharge outfalls into Caswell Stream which flows into Caswell Brook, a tributary of Blakesly Brook and then eventually the River Tove, see Figure 2.

4.2 Caswell Stream, Caswell Brook, and Blakesley Brook all lie within Blakesley Brook WFD Water Body (Water Body ID GB105033038280). The catchment is 3,632 ha in area and is determined as having ‘heavily modified’ hydromorphology and ‘moderate’ ecological status according to the EA’s Catchment Data Explorer[5]. The physico-chemical status of Blakesley Brook is shown in **Error! Reference source not found.**.

4.3 The River Tove catchment[6] is 8,755 ha in area and is also described as having ‘heavily modified’ hydromorphology and ‘moderate’ ecological status (Water Body ID GB105033038180). The physico-chemical status of the River Tove is shown in Table 7.

Table 6. Physico-chemical Quality Status - Blakesly Brook

Classification Item	2013	2014	2015	2016	2019	2022
Physico-chemical quality elements	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Ammonia (Phys-Chem)	High	High	High	High	High	High
Dissolved oxygen	High	High	High	High	High	High
Phosphate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Temperature	High	High	High	High	High	High
pH	High	High	High	High	High	High

Table 7. Physico-chemical Quality Status - River Tove

Classification Item	2013	2014	2015	2016	2019	2022
Physico-chemical quality elements	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Ammonia (Phys-Chem)	High	High	High	High	High	High
Dissolved oxygen	High	High	High	High	High	High
Phosphate	Poor	Poor	Poor	Poor	Poor	Moderate
Temperature	High	High	High	High	High	High
pH	High	High	High	High	High	High

[5] Blakesley Brook | Catchment Data Explorer | Catchment Data Explorer
[6] Tove (DS Greens Norton) | Catchment Data Explorer | Catchment Data Explorer

4.4 The objectives listed on the EA's Catchment Data Explorer state that a 'good' status for physico-chemical quality elements is aimed to be achieved by 2027 in both Blakesley Brook and River Tove, but there is a low confidence that this will be achieved.

4.5 To assess the current water quality of the watercourses at the assessment points, the mean, standard deviation, and 90-percentile concentration of each sanitary parameter was calculated over 2000-2020 where available. The results are shown in Appendix A.

4.6 This was undertaken using the EA's water quality dataset for a sampling point (AN-04M13) ~ 615m downstream of the proposed outfall site (see Figure 2). This was the closest available monitoring site; no alternative sampling sites were with a suitable dataset were available for any of the assessment points.

4.7 The catchment area of the sampling point is much greater than the catchment area of the discharge point. Therefore, the effect of the discharge on the sampling point will be minimal, making it an appropriate baseline.

4.8 The background chemical data of the EA's Caswell Brook Sampling Point was used for all four assessment points as it had the most comprehensive background data.

4.9 Mean flow (Q_{mean}) and low flow (Q95) for each assessment point were quantified using LowFlows 2. The catchments for the Low Flow model were delineated using publicly available LIDAR data. Estimated Q_{mean} and Q95 flows for each assessment point are included in Table 8 below. The full Low Flow results are included as Appendix B.

Table 8. Low Flow Modelling Results

Low Flow Modelling Results

Assessment Point	Q_{mean} (m^3/s)	Q95 (m^3/s)
Caswell Stream	0.005	0.001
Caswell Brook	0.059	0.009
Blakesley Brook	0.272	0.044
River Tove	0.699	0.116

5 Existing Discharge

5.1 In the previous issue of this report, sampling of the effluent took place from 04/01/2021 to 30/12/2024. The effluent sampling data in this report includes the previous dataset and data up to 01/09/2025. A nitrification plant was added to the sanitary treatment train in January 2025.

5.2 Sampling of the effluent has generally taken place every two days. For each sampling date, an average of 30 samples were taken and averaged. There was a total of 687 sampling days. The following parameters were tested for:

- pH
- Total Suspended Solids (TSS)
- Biochemical Oxygen Demand (BOD)
- Chemical Oxygen Demand (COD)
- Ammoniacal Nitrogen as Nitrogen (NH3)
- Chloride
- Total Phosphorus
- Cadmium
- Total Chromium
- Copper
- Lead
- Nickel
- Zinc
- Arsenic
- Mercury

Effluent Flow

5.3 Flows from the outfall are gauged using a flume. In the previous issue of this report, one year of data supplied by the client from January 2024 to January 2025 was used. Mean flow was recorded as 0.69l/s. For this report, an updated flow rate of 0.72l/s has been used to more accurately reflect current flow rates.

Specific Pollutants & Priority Hazardous Substances

5.4 Eight chemicals were identified in the effluent that are designated as either specific pollutants or priority hazardous substances and therefore require risk assessment. The substances, mean concentrations, and maximum concentrations are listed below in Table 9.

Table 9. Concentrations of Designated Substances in the Effluent

Substance	Mean Concentration (µg/l)	Maximum Concentration (µg/l)
Cadmium	0.23	0.5
Chromium	0.3	0.64
Copper	7.52	12.66
Lead	1.16	2.38
Nickel	1.97	2.6
Zinc	26.06	48.41
Arsenic	0.96	1.52
Mercury	0.41	0.86

**Only concentrations of total Chromium were provided, these have been tested against the Environmental Quality Standards for both trivalent (III) and hexavalent (VI) chromium.*

D2 Sanitary Parameters

5.5 The following parameters were included in the D2 assessment:

- pH
- Suspended Solids
- Biochemical Oxygen Demand (BOD)
- Ammoniacal Nitrogen as N
- Chloride
- Total Phosphorous

5.6 These parameters were chosen to include the physico-chemical WFD indicators and flow H1 D2 guidance, however reactive phosphorous, temperature and dissolved oxygen data were not provided.

5.7 The lab results for sanitary parameters are included in Appendix C.

6 Impact of Discharge

Specific Pollutants & Priority Hazardous Substances

6.1 The designated substances detected in the effluent were subjected to screening tests within the H1 tool. The results of each test are outlined below. Results from the H1 tool are included as Appendix D.

6.2 Substances can be screened out as not posing a risk to the environment under Test 1 of the H1 methodology if mean and maximum concentrations of the substance do not exceed 10% of their respective EQS's.

6.3 Substances can be screened out as not posing a risk to the environment under Test 2 if the Process Contribution (the concentration of a substance after it has been diluted in the receiving watercourse) does not exceed 4% of the EQS.

6.4 Substances not screened out under Tests 1 and 2 must pass Tests 3, 4A, and 4B in order to be screened out as not posing a risk to the environment. Tests 3, 4A, and 4B test the Predicted Environmental Concentration (PEC) (the Process Contribution plus the background concentration of the substances in the receiving water course) or PEC against the EQS.

6.5 To pass Test 3, the difference in the PEC and the background concentration of a substance must not exceed 10% of the EQS.

6.6 To pass Test 4A and the PEC must not exceed the Annual Average EQS, Test 4B applies the same test to the MAC EQS.

Caswell Stream H1 Assessment

6.7 Arsenic, Trivalent (III) Chromium, and Hexavalent (VI) Chromium were screened out under Test 1.

6.8 No substances were screened out under Test 2.

6.9 Nickel was screened out under Test 3, 4A, and 4B.

6.10 A total of six substances could not be screened out using the H1 risk assessment methodology. These substances are Cadmium, Chloride, Copper, Lead, Mercury, and Zinc. The background concentrations for these substances were taken from the EA's AN-04M13 sampling point and are included in Table 10 below.

Table 10. Background Concentrations in Caswell Stream.

Substance	Mean Background Concentration (µg/l)
Cadmium	0.01
Chloride	3.50
Copper	1.44
Lead	2.27
Mercury	0.10
Zinc	1.26

Caswell Brook H1 Assessment

6.11 Arsenic, Trivalent (III) Chromium, and Hexavalent (VI) Chromium were screened out under Test 1.

6.12 Nickel and Cadmium were screened out under Test 2.

6.13 Mercury was screened out under Test 3, 4A, and 4B.

6.14 A total of four substances could not be screened out using the H1 risk assessment methodology. These substances are Chloride, Copper, Lead, and Zinc. The background concentrations for these substances were taken from the EA's AN-04M13 sampling point.

Blakesley Brook H1 Assessment

6.15 Arsenic, Trivalent (III) Chromium, and Hexavalent (VI) Chromium were screened out under Test 1.

6.16 Cadmium, Chloride, Lead, Nickel, and Zinc were screened out under Test 2.

6.17 Mercury was screened out under Tests 3, 4A, and 4B.

6.18 Copper was the only substance that could not be screened out of the H1 risk assessment methodology.

River Tove H1 Assessment

6.19 Arsenic, Trivalent (III) Chromium, and Hexavalent (VI) Chromium were screened out under Test 1.

6.20 Cadmium, Chloride, Lead, Mercury, Nickel, and Zinc were screened out under Test 2.

6.21 No substances were screened out in Tests 3, 4A, and 4B.

6.22 Copper was the only substance that could not be screened out of the H1 methodology.

Significant Load

6.23 An additional test is applied to priority hazardous pollutants, including Cadmium and Mercury, to ensure a risk is not posed to the environment from loading of these pollutants rather than concentration. Annual loading limits of 5kg and 1kg are applied for Cadmium and Mercury respectively.

6.24 Annual loading of Cadmium and Mercury were calculated as 2.40g and 4.37g respectively. While the significant load test for Cadmium and Mercury is passed, substances not screened out under the previous H1 tests still require modelling to assess risk.

6.25 This test does not need to be repeated for each assessment point as it calculates the mass of the substance from the outfall, which remains the same regardless of the dilution.

Bio-Available Metals

6.26 Metals with a bio-available fraction including Copper, Lead, and Zinc not screened out using the H1 methodology are modelled to assess risk using the M-PER tool within the RQP software.

6.27 Like other components in the RQP suite, M-PER calculates concentrations in river reaches based on a simple mass balance mixing equation which is applied in an iterative Monte Carlo simulation using the method of combining distributions proposed by Warn and Brew (1980)[7].

6.28 The M-PER tool calculates a mean downstream concentration for the relevant substance. This can be compared to the EQS which for metals such as Zinc is set based on the bio-available fraction. Where the calculated mean concentration does not exceed the relevant EQS, the substance is not likely to pose a risk to the environment, provided the standard deviation of the mean concentration is reasonable.

6.29 Lead is additionally subjected to a 95th percentile EQS of 14 µg/l. The downstream discharge was calculated at 2.34µg/l. This is done through a regular Monte-Carlo calculation as it is not based on bioavailability. Therefore, Lead is shown to not be at risk to the environment.

Table 11. Caswell Stream M-PER Results for Bio-metals

Substance	Calculated Mean Downstream Bio-Metal Concentration (µg/l)	Range (95%) Confidence	Environmental Quality Standard (µg/l)
Copper	0.41	0.35 – 0.48	1
Lead	0.31	0.27 – 0.35	1.2
Zinc	4.79	4.42 – 5.16	10.9

Table 12. Caswell Brook M-PER Results for Bio Metals

Substance	Calculated Mean Downstream Bio-Metal Concentration (µg/l)	Range (95%) Confidence	Environmental Quality Standard (µg/l)
Copper	0.27	0.22 – 0.33	1
Lead	0.31	0.25 – 0.37	1.2
Zinc	3.58	3.16 – 4.01	10.9

Table 13. Blakesley Brook M-PER Results for Bio Metals

Substance	Calculated Mean Downstream Bio-Metal Concentration (µg/l)	Range (95%) Confidence	Environmental Quality Standard (µg/l)
Copper	0.26	0.20 – 0.31	1

[7] Warn, A.E. and Brew, J.S., 1980. Mass balance. Water Research, 14(10), pp.1427-1434.

Table 14. River Tove M-PER Results for Bio Metals

Substance	Calculated Mean Downstream Bio-Metal Concentration (µg/l)	Range (95%) Confidence	Environmental Quality Standard (µg/l)
Copper	0.26	0.20 – 0.31	1

6.30 Following the above results, it can be concluded that Lead, Zinc, and Copper concentrations in the discharge will not pose a risk to the environment. The results of the non-sanitary Monte-Carlo calculations can be found in Appendix E.

D2 Sanitary Parameters

6.31 Water quality at the assessment points was calculated using the discharge concentrations measured in the lab and the background concentrations from EA data. The River Quality Planning Software provided by the EA was used to carry out the Monte-Carlo simulations.

6.32 The distribution of each parameter was checked. RQP from the EA, assumes a log-normal distribution. The distribution of each parameter is in Appendix A.

6.33 RQP uses correlation to calculate deterioration limits. Instead of assuming the correlation to be the standard values, the correlations between discharge flow and discharge water quality parameters were calculated using Pearson correlation.

6.34 Appendix C includes a table of correlations used, including the number of samples used to calculate each correlation.

6.35 For each D2 determinant, downstream concentrations were considered unacceptable where the discharge resulted in a 10% or greater deterioration in quality. Where the deterioration was less than 10%, some deterioration was considered acceptable as long as the discharge was not predicted to cause a negative change in the relevant WFD classification element (for example causing a change in Phosphorus WFD classification from Good to Moderate).

Caswell Stream D2 Assessment

6.36 The effluent from the site was estimated to cause a deterioration in water quality of more than 10% at the Caswell Stream assessment point with respect to all substances assessed excluding Suspended Solids, for which there was no deterioration and BOD in 90th percentile concentration which resulted in a 3.24% deterioration. Results of the assessment are included as Table 15.

6.37 According to the standards outlined in Table 2 the change in downstream water quality with respect to BOD would not cross a WFD classification boundary, so BOD concentrations in the discharge are acceptable at the Caswell Stream assessment point.

Table 15. Results of the Caswell Stream D2 Assessment

Substance	Calculated Mean Downstream Concentration (mg/l)	Percentage Deterioration	Range (95%) Confidence	Calculated 90th Percentile Downstream Concentration (mg/l)	Percentage Deterioration	Range (95%) Confidence
Ammoniacal-N	0.142	128.88%	0.139 - 0.144	0.307	124.09%	0.302 - 0.313
BOD	2.378	13.97%	2.335 - 2.422	4.586	3.24%	4.487 - 4.689
Total Suspended Solids	19.507	No Deterioration	18.428 - 20.587	42.390	No Deterioration	40.279 - 44.716
Total Phosphorus	0.537	335.90%	0.533 - 0.540	0.876	275.97%	0.870 - 0.883
Chloride	142.828	193.14%	142.028 - 143.627	217.792	238.56%	216.240 - 219.404

6.38 Required discharge mean concentrations were calculated for each substance where the limit of 10% deterioration in quality was exceeded, these are outlined in Table 16. If the mean concentrations in the discharge can be limited to these levels a deterioration of less than 10% would likely be achieved.

Table 16. Required Discharge Mean Concentrations at Caswell Stream

Substance	Required Discharge Mean (mg/l)
Ammoniacal-N	0.112
Total Phosphorus	0.219
Chloride	82.018

6.39 Downstream pH at Caswell Stream was estimated to assess compliance with the acid conditions standards outlined in Table 5. The results indicate that downstream acid conditions would not deteriorate from High WFD classification status.

Table 17. Estimated pH at Caswell Stream

Downstream pH	pH	Range (95% Confidence)
5th Percentile	7.61	7.60 - 7.62
10th Percentile	7.68	7.67 - 7.69
95th Percentile	8.27	8.26 - 8.28

Caswell Brook D2 Assessment

6.40 The effluent from the site was estimated to cause a deterioration in water quality of more than 10% at the Caswell Stream assessment point with respect to all substances assessed excluding Suspended Solids, for which there was no deterioration and BOD for which there was a 1.56% and 0.38% deterioration for mean and 90th percentile concentrations respectively. Results of the assessment are included as Table 18.

6.41 According to the standards outlined in Table 2 the change in downstream water quality with respect to BOD would not cross a WFD classification boundary, so BOD concentrations in the discharge are acceptable at the Caswell Brook assessment point.

Table 18. Results of the Caswell Brook D2 Assessment

Substance	Calculated Mean Downstream Concentration (mg/l)	Percentage Deterioration	Range (95%) Confidence	Calculated 90th Percentile Downstream Concentration (mg/l)	Percentage Deterioration	Range (95%) Confidence
Ammoniacal-N	0.072	15.73%	0.0689 - 0.0746	0.152	10.95%	0.146 - 0.158
BOD	2.119	1.56%	2.005 - 2.233	4.459	0.38%	4.215 - 4.732
Total Suspended Solids	22.678	No Deterioration	19.216 - 26.141	50.060	No Deterioration	43.984 - 57.649
Total Phosphorus	0.173	40.43%	0.171 - 0.176	0.308	32.19%	0.303 - 0.314
Chloride	60.187	23.53%	59.742 - 60.632	82.269	27.89%	81.479 - 83.100

6.42 Required discharge mean concentrations were calculated for each substance where the limit of 10% deterioration in quality was exceeded, these are outlined in Table 19. If the mean concentrations in the discharge can be limited to these levels a deterioration of less than 10% would likely be achieved.

Table 19. Required Discharge Mean Concentrations at Caswell Brook

Substance	Required Discharge Mean (mg/l)
Ammoniacal-N	0.381
Total Phosphorus	0.777
Chloride	300.525

6.43 Downstream pH at Caswell Brook was estimated to assess compliance with the acid conditions standards outlined in Table 5. The results indicate that downstream acid conditions would not deteriorate from High WFD classification status.

Table 20. Estimated pH at Caswell Brook

Downstream pH	pH	Range (95% Confidence)
5th Percentile	7.73	7.71 - 7.75
10th Percentile	7.81	7.79 - 7.83
95th Percentile	8.45	8.43 - 8.48

Blakesly Brook D2 Assessment

6.44 The effluent from the site was estimated to cause a deterioration in water quality of less than 10% at the Blakesley Brook assessment point with respect to all substances assessed excluding Suspended Solids, for which there was no deterioration. Results of the assessment are included as Table 22.

6.45 According to the standards outlined in Section 3, none of the estimated downstream concentrations would cross a WFD classification boundary. Therefore, the impact of the discharge at the Blakesly Brook assessment point is compliant with the standards outlined in the H1 Annex D2 guidance, with respect to the substances assessed.

Table 21. Results of the Blakesly Brook D2 Assessment

Substance	Calculated Mean Downstream Concentration (mg/l)	Percentage Deterioration	Range (95%) Confidence	Calculated 90th Percentile Downstream Concentration (mg/l)	Percentage Deterioration	Range (95%) Confidence
Ammoniacal-N	0.064	3.32%	0.0596 - 0.0687	0.140	2.19%	0.132 - 0.150
BOD	2.094	0.36%	1.879 - 2.308	4.452	0.23%	4.014 - 4.987
Total Suspended Solids	23.070	No Deterioration	17.355 - 28.785	50.916	No Deterioration	41.504 - 64.242
Total Phosphorus	0.134	8.77%	0.130 - 0.138	0.248	6.44%	0.240 - 0.256
Chloride	51.189	5.06%	50.566 - 51.812	67.757	5.33%	66.699 - 68.903

6.46 Downstream pH at Blakesly Brook was estimated to assess compliance with the acid conditions standards outlined in Table 5. The results indicate that downstream acid conditions would not deteriorate from High WFD classification status.

Table 22. Estimated Downstream pH at Blakesly Brook

Downstream pH	pH	Range (95% Confidence)
5th Percentile	7.74	7.71 - 7.77
10th Percentile	7.82	7.79 - 7.84
95th Percentile	8.48	8.45 - 8.52

River Tove D2 Assessment

6.47 The effluent from the site was estimated to cause a deterioration in water quality of less than 10% at the River Tove assessment point with respect to all substances assessed, excluding Suspended Solids, for which there was no deterioration. Results of the assessment are included as Table 23.

6.48 According to the standards outlined in Section 3, none of the estimated downstream concentrations would cross a WFD classification boundary. Therefore, the impact of the discharge at the Blakesly Brook assessment point is compliant with the standards outlined in the H1 Annex D2 guidance, with respect to the substances assessed.

Table 23. Results of the River Tove D2 Assessment

Substance	Calculated Mean Downstream Concentration (mg/l)	Percentage Deterioration	Range (95%) Confidence	Calculated 90th Percentile Downstream Concentration (mg/l)	Percentage Deterioration	Range (95%) Confidence
Ammoniacal-N	0.063	1.22%	0.0565 - 0.0691	0.138	0.73%	0.126 - 0.151
BOD	2.089	0.12%	1.792 - 2.387	4.447	0.11%	3.859 - 5.214
Total Suspended Solids	23.136	No Deterioration	16.396 - 29.877	50.998	No Deterioration	40.195 - 67.223
Total Phosphorus	0.127	3.09%	0.122 - 0.133	0.239	2.58%	0.227 - 0.251
Chloride	49.673	1.95%	48.781 - 50.565	65.637	2.03%	64.147 - 67.300

6.49 Downstream pH at the River Tove assessment was estimated to assess compliance with the acid conditions standards outlined in Table 5. The results indicate that downstream acid conditions would not deteriorate from High WFD classification status.

Table 24. Estimated Downstream pH at Blakesly Brook

Downstream pH	pH	Range (95% Confidence)
5th Percentile	7.74	7.70 - 7.77
10th Percentile	7.82	7.79 - 7.85
95th Percentile	8.49	8.45 - 8.53

7 Conclusion

7.1 Eight non-sanitary substances which required risk assessment under the H1 methodology have been identified in the effluent discharge into Caswell Stream. Of these, six could not be screened out using the H1 risk assessment methodology for Caswell Stream. Four substances could not be screened out for Caswell Brook, and one substance could not be screened out for both Blakesley Brook and River Tove.

7.2 Further modelling was undertaken for the remaining substances using Monte Carlo simulations with the River Quality Planning (RQP) software suite. For the substances with an Environmental Quality Standard based on bioavailability, the M-PER tool was used.

7.3 Further modelling has demonstrated the remaining non-sanitary substances do not pose a risk to the environment within a 95% confidence value.

7.4 The impact of sanitary pollutants in the Lumentum process discharge on Caswell Stream, Caswell Brook, Blakesley Brook, and River Tove has been assessed in accordance with H1 Annex D2.

7.5 Monte Carlo calculations were carried out using the RQP software to determine the impact of the process effluent on watercourses at each assessment point. These calculations used data on the river's flow and water quality and the discharge's flow and water quality.

7.6 Concentrations of Suspended Solids and Biochemical Oxygen Demand (BOD) and pH are compliant with the standards outlined in the H1 Annex D2 guidance at all assessment points.

7.7 Concentrations of Ammonia, Phosphorus and Chloride are not compliant with the standards outlined in the H1 Annex D2 guidance at the Caswell Stream and Caswell Brook assessment points.

7.8 Concentrations of all substances assessed under the D2 guidance at the Blakesly Brook and River Tove assessment points were compliant with the standards outlined in the H1 Annex D2 guidance.

Appendices

Water Quality at EA Sampling Point AN-04M13

Parameters	pH	Water Temperature	Ammoniacal Nitrogen as N	Nitrate as N	Reactive Phosphorus as P	Total Phosphorus as P	Suspended Solids at 105 C	Chloride as Cl	BOD + ATU (5 Day)
Units	pH	(°C)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
Sample Range	2013 - 2024	2000 – 2020	2000 - 2020	2000 - 2020	2000 - 2020	2000 - 2020	2000 - 2020	2000 – 2008	2000 – 2008
Average	8.05	10.31	0.10	7.24	0.08	0.12	23.18	48.7	2.09
90-percentile	8.25	15.27	0.11	9.76	0.13	0.21	42.02	66.3	3.35
Number of samples	116	217	196	100	196	66	189	96	96
Standard deviation	0.182	3.78	0.50	1.96	0.06	0.10	45.05	12.2	2.73

Source: EA, 2025, Open WIMS data, accessed November 2025

Appendix B Low Flow Results

Caswell Stream

Low-Flow Estimates from LowFlows	
www.hydrosolutions.co.uk	
Catchment Characteristics	
Region	England: Anglian
Area	(33) Great Ouse
Boundar	Imported polygon
Catchmei	0.682
No significant lakes in catchment	
Grid-reso	20
Runoff (r	214.2
BFI	0.388

	Annual	January	Februar	March	April	May	June	July	August	September	October	November	December
Qmean	0.005	0.009	0.008	0.007	0.006	0.003	0.002	0.002	0.002	0.002	0.003	0.005	0.008
Q(0.1)	0.076	0.049	0.067	0.052	0.08	0.041	0.06	0.042	0.045	0.04	0.043	0.055	0.047
Q(1)	0.04	0.037	0.035	0.036	0.033	0.024	0.02	0.011	0.017	0.014	0.028	0.034	0.038
Q(2)	0.029	0.031	0.031	0.03	0.025	0.016	0.013	0.006	0.01	0.008	0.02	0.026	0.032
Q(3)	0.023	0.029	0.028	0.027	0.022	0.013	0.009	0.004	0.007	0.006	0.015	0.022	0.029
Q(4)	0.019	0.027	0.025	0.023	0.02	0.011	0.007	0.004	0.005	0.005	0.013	0.018	0.026
Q(5)	0.016	0.024	0.023	0.021	0.018	0.01	0.006	0.003	0.005	0.004	0.011	0.016	0.023
Q(6)	0.015	0.022	0.021	0.019	0.016	0.008	0.006	0.003	0.004	0.003	0.009	0.014	0.02
Q(7)	0.013	0.021	0.019	0.017	0.014	0.007	0.005	0.003	0.004	0.003	0.009	0.013	0.019
Q(8)	0.012	0.019	0.018	0.015	0.013	0.007	0.005	0.002	0.003	0.003	0.008	0.012	0.017
Q(9)	0.011	0.018	0.016	0.014	0.012	0.006	0.004	0.002	0.003	0.003	0.007	0.012	0.017
Q(10)	0.01	0.017	0.015	0.014	0.011	0.006	0.004	0.002	0.003	0.002	0.007	0.011	0.016
Q(11)	0.01	0.016	0.015	0.013	0.01	0.005	0.004	0.002	0.003	0.002	0.006	0.01	0.015
Q(12)	0.009	0.015	0.014	0.012	0.01	0.005	0.003	0.002	0.002	0.002	0.006	0.009	0.014
Q(13)	0.008	0.015	0.013	0.012	0.009	0.005	0.003	0.002	0.002	0.002	0.005	0.009	0.013
Q(14)	0.008	0.014	0.012	0.011	0.008	0.005	0.003	0.002	0.002	0.002	0.005	0.008	0.012
Q(15)	0.008	0.014	0.012	0.01	0.008	0.005	0.003	0.002	0.002	0.002	0.005	0.008	0.012
Q(16)	0.007	0.013	0.011	0.01	0.008	0.004	0.003	0.002	0.002	0.002	0.004	0.008	0.011
Q(17)	0.007	0.013	0.011	0.01	0.007	0.004	0.003	0.002	0.002	0.002	0.004	0.007	0.011
Q(18)	0.006	0.012	0.011	0.009	0.007	0.004	0.003	0.002	0.002	0.002	0.004	0.007	0.011
Q(19)	0.006	0.012	0.01	0.009	0.007	0.004	0.003	0.002	0.002	0.002	0.004	0.007	0.01
Q(20)	0.006	0.011	0.01	0.009	0.006	0.004	0.002	0.002	0.002	0.002	0.003	0.007	0.01
Q(21)	0.006	0.011	0.009	0.009	0.006	0.004	0.002	0.002	0.002	0.002	0.003	0.006	0.01
Q(22)	0.005	0.01	0.009	0.008	0.006	0.004	0.002	0.002	0.002	0.002	0.003	0.006	0.009
Q(23)	0.005	0.01	0.009	0.008	0.006	0.003	0.002	0.002	0.002	0.001	0.003	0.006	0.009
Q(24)	0.005	0.01	0.009	0.008	0.005	0.003	0.002	0.002	0.002	0.001	0.003	0.006	0.009
Q(25)	0.005	0.01	0.008	0.008	0.005	0.003	0.002	0.002	0.002	0.001	0.003	0.005	0.008
Q(26)	0.005	0.009	0.008	0.007	0.005	0.003	0.002	0.001	0.002	0.001	0.003	0.005	0.008
Q(27)	0.005	0.009	0.008	0.007	0.005	0.003	0.002	0.001	0.002	0.001	0.002	0.005	0.008
Q(28)	0.004	0.009	0.007	0.007	0.005	0.003	0.002	0.001	0.001	0.001	0.002	0.005	0.008
Q(29)	0.004	0.009	0.007	0.007	0.005	0.003	0.002	0.001	0.001	0.001	0.002	0.005	0.008
Q(30)	0.004	0.009	0.007	0.007	0.004	0.003	0.002	0.001	0.001	0.001	0.002	0.005	0.007
Q(31)	0.004	0.008	0.007	0.007	0.004	0.003	0.002	0.001	0.001	0.001	0.002	0.004	0.007
Q(32)	0.004	0.008	0.007	0.006	0.004	0.003	0.002	0.001	0.001	0.001	0.002	0.004	0.007
Q(33)	0.004	0.008	0.006	0.006	0.004	0.003	0.002	0.001	0.001	0.001	0.002	0.004	0.007
Q(34)	0.004	0.008	0.006	0.006	0.004	0.003	0.002	0.001	0.001	0.001	0.002	0.004	0.007
Q(35)	0.003	0.008	0.006	0.006	0.004	0.003	0.002	0.001	0.001	0.001	0.002	0.004	0.006
Q(36)	0.003	0.008	0.006	0.006	0.004	0.003	0.002	0.001	0.001	0.001	0.002	0.004	0.006
Q(37)	0.003	0.007	0.006	0.006	0.004	0.002	0.002	0.001	0.001	0.001	0.002	0.004	0.006
Q(38)	0.003	0.007	0.006	0.006	0.004	0.002	0.002	0.001	0.001	0.001	0.002	0.003	0.006
Q(39)	0.003	0.007	0.006	0.005	0.004	0.002	0.002	0.001	0.001	0.001	0.002	0.003	0.006
Q(40)	0.003	0.007	0.006	0.005	0.004	0.002	0.002	0.001	0.001	0.001	0.002	0.003	0.006
Q(41)	0.003	0.007	0.005	0.005	0.003	0.002	0.002	0.001	0.001	0.001	0.002	0.003	0.006
Q(42)	0.003	0.006	0.005	0.005	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.003	0.005
Q(43)	0.003	0.006	0.005	0.005	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.003	0.005
Q(44)	0.003	0.006	0.005	0.005	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.003	0.005
Q(45)	0.003	0.006	0.005	0.005	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.003	0.005
Q(46)	0.002	0.006	0.005	0.005	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.003	0.005
Q(47)	0.002	0.006	0.005	0.005	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.003	0.005
Q(48)	0.002	0.006	0.005	0.005	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.003	0.005
Q(49)	0.002	0.005	0.005	0.005	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.003	0.005

Q(50)	0.002	0.005	0.005	0.005	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.003	0.004
Q(51)	0.002	0.005	0.005	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.004
Q(52)	0.002	0.005	0.004	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.004
Q(53)	0.002	0.005	0.004	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.004
Q(54)	0.002	0.005	0.004	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.004
Q(55)	0.002	0.005	0.004	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.004
Q(56)	0.002	0.005	0.004	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.004
Q(57)	0.002	0.005	0.004	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.004
Q(58)	0.002	0.005	0.004	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.004
Q(59)	0.002	0.005	0.004	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.004
Q(60)	0.002	0.004	0.004	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.003
Q(61)	0.002	0.004	0.004	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.003
Q(62)	0.002	0.004	0.004	0.004	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.003
Q(63)	0.002	0.004	0.004	0.004	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.003
Q(64)	0.001	0.004	0.004	0.004	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.003
Q(65)	0.001	0.004	0.004	0.004	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.003
Q(66)	0.001	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.003
Q(67)	0.001	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.003
Q(68)	0.001	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.002	0.003
Q(69)	0.001	0.004	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.003
Q(70)	0.001	0.004	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003
Q(71)	0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003
Q(72)	0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003
Q(73)	0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003
Q(74)	0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003
Q(75)	0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003
Q(76)	0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(77)	0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(78)	0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(79)	0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(80)	0.001	0.003	0.003	0.003	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(81)	0.001	0.003	0.003	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(82)	0.001	0.003	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(83)	0.001	0.003	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(84)	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(85)	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(86)	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(87)	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(88)	0.001	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Q(89)	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Q(90)	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Q(91)	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Q(92)	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Q(93)	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Q(94)	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Q(95)	0.001	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0	0.001	0.001	0.001	0.001
Q(96)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0	0	0.001	0.001	0.001
Q(97)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0	0	0.001	0.001	0.001
Q(98)	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0	0	0	0.001	0.001	0.001
Q(99)	0	0.001	0.001	0.001	0.001	0.001	0	0	0	0	0	0.001	0.001
Q(99.9)	0	0.001	0.001	0.001	0.001	0.001	0	0	0	0	0	0	0.001

Caswell Brook

Low-Flow Estimates from LowFlows		
www.hydrosolutions.co.uk		
Catchment Characteristics		
Region	England: Anglian	
Area	(33) Great Ouse	
Boundar	Imported polygon	
Catchme	8.163	
No significant lakes in catchment		
Grid-res	20	
Runoff (	228.7	
BFI	0.441	

	Annual	January	Februar	March	April	May	June	July	August	September	October	November	December
Qmean	0.059	0.106	0.098	0.08	0.073	0.038	0.031	0.02	0.024	0.023	0.043	0.073	0.103
Q(0.1)	0.892	0.621	0.545	0.591	0.789	0.496	0.66	0.51	0.566	0.483	0.526	0.712	0.934
Q(1)	0.482	0.427	0.439	0.416	0.386	0.267	0.22	0.142	0.223	0.19	0.321	0.453	0.468
Q(2)	0.353	0.377	0.395	0.347	0.334	0.187	0.14	0.085	0.144	0.112	0.245	0.355	0.405
Q(3)	0.284	0.34	0.362	0.294	0.281	0.139	0.112	0.065	0.097	0.089	0.199	0.304	0.369
Q(4)	0.236	0.315	0.31	0.263	0.255	0.117	0.096	0.055	0.074	0.071	0.168	0.241	0.327
Q(5)	0.204	0.285	0.29	0.226	0.229	0.105	0.081	0.046	0.064	0.063	0.147	0.21	0.299
Q(6)	0.182	0.276	0.259	0.197	0.201	0.092	0.073	0.041	0.057	0.054	0.128	0.194	0.272
Q(7)	0.165	0.252	0.238	0.178	0.182	0.083	0.067	0.037	0.051	0.048	0.118	0.177	0.248
Q(8)	0.151	0.235	0.215	0.163	0.171	0.075	0.063	0.034	0.046	0.043	0.106	0.167	0.232
Q(9)	0.138	0.213	0.203	0.154	0.161	0.068	0.058	0.031	0.041	0.04	0.099	0.158	0.218
Q(10)	0.129	0.205	0.188	0.146	0.148	0.064	0.053	0.03	0.037	0.038	0.092	0.15	0.208
Q(11)	0.12	0.192	0.18	0.135	0.134	0.06	0.05	0.028	0.035	0.035	0.086	0.136	0.195
Q(12)	0.114	0.183	0.173	0.129	0.126	0.058	0.047	0.027	0.033	0.033	0.078	0.131	0.185
Q(13)	0.107	0.176	0.162	0.123	0.12	0.055	0.045	0.026	0.031	0.032	0.074	0.124	0.174
Q(14)	0.102	0.17	0.156	0.121	0.113	0.053	0.042	0.025	0.029	0.03	0.069	0.119	0.166
Q(15)	0.096	0.165	0.152	0.116	0.108	0.051	0.04	0.025	0.028	0.029	0.065	0.115	0.16
Q(16)	0.092	0.159	0.145	0.11	0.103	0.049	0.039	0.024	0.027	0.027	0.062	0.11	0.155
Q(17)	0.087	0.153	0.138	0.107	0.099	0.047	0.037	0.023	0.026	0.026	0.059	0.105	0.151
Q(18)	0.083	0.149	0.132	0.103	0.094	0.046	0.036	0.023	0.026	0.026	0.055	0.102	0.143
Q(19)	0.079	0.141	0.127	0.101	0.09	0.045	0.034	0.022	0.025	0.025	0.052	0.096	0.135
Q(20)	0.075	0.137	0.122	0.098	0.085	0.043	0.033	0.022	0.025	0.024	0.049	0.093	0.132
Q(21)	0.072	0.133	0.118	0.095	0.082	0.042	0.032	0.022	0.024	0.024	0.047	0.09	0.129
Q(22)	0.07	0.13	0.113	0.091	0.08	0.04	0.031	0.021	0.023	0.023	0.045	0.087	0.125
Q(23)	0.067	0.126	0.109	0.088	0.077	0.039	0.03	0.021	0.023	0.023	0.043	0.083	0.121
Q(24)	0.065	0.123	0.106	0.086	0.074	0.038	0.03	0.02	0.023	0.022	0.041	0.079	0.116
Q(25)	0.062	0.12	0.103	0.083	0.071	0.037	0.029	0.02	0.022	0.022	0.04	0.077	0.114
Q(26)	0.06	0.117	0.1	0.081	0.069	0.036	0.028	0.02	0.021	0.021	0.038	0.074	0.111
Q(27)	0.058	0.114	0.097	0.078	0.067	0.036	0.028	0.019	0.021	0.02	0.037	0.072	0.108
Q(28)	0.056	0.111	0.093	0.076	0.065	0.035	0.027	0.019	0.021	0.02	0.035	0.07	0.104
Q(29)	0.055	0.109	0.09	0.075	0.062	0.034	0.027	0.019	0.02	0.02	0.034	0.068	0.102
Q(30)	0.053	0.107	0.088	0.072	0.061	0.033	0.026	0.019	0.02	0.019	0.033	0.066	0.099
Q(31)	0.051	0.104	0.086	0.071	0.06	0.033	0.026	0.018	0.019	0.019	0.032	0.064	0.096
Q(32)	0.049	0.101	0.084	0.07	0.058	0.032	0.025	0.018	0.019	0.019	0.032	0.062	0.094
Q(33)	0.048	0.1	0.082	0.068	0.057	0.032	0.025	0.018	0.019	0.018	0.031	0.06	0.091
Q(34)	0.046	0.098	0.08	0.067	0.056	0.031	0.024	0.018	0.018	0.018	0.03	0.058	0.089
Q(35)	0.045	0.095	0.078	0.066	0.054	0.03	0.024	0.017	0.018	0.018	0.029	0.056	0.087
Q(36)	0.043	0.094	0.076	0.065	0.052	0.03	0.024	0.017	0.018	0.017	0.028	0.055	0.084
Q(37)	0.042	0.092	0.075	0.063	0.051	0.029	0.024	0.017	0.018	0.017	0.027	0.053	0.082
Q(38)	0.041	0.088	0.073	0.062	0.05	0.029	0.023	0.017	0.017	0.017	0.026	0.052	0.081
Q(39)	0.04	0.087	0.071	0.061	0.049	0.029	0.023	0.017	0.017	0.017	0.026	0.05	0.079
Q(40)	0.039	0.085	0.07	0.06	0.048	0.028	0.023	0.016	0.017	0.016	0.025	0.049	0.077
Q(41)	0.038	0.084	0.069	0.059	0.047	0.028	0.022	0.016	0.016	0.016	0.024	0.048	0.076
Q(42)	0.037	0.081	0.067	0.058	0.046	0.027	0.022	0.016	0.016	0.016	0.024	0.046	0.073
Q(43)	0.036	0.08	0.066	0.057	0.045	0.027	0.022	0.016	0.016	0.016	0.023	0.045	0.072
Q(44)	0.035	0.079	0.065	0.056	0.044	0.027	0.021	0.016	0.016	0.016	0.023	0.044	0.071
Q(45)	0.034	0.077	0.063	0.056	0.044	0.026	0.021	0.015	0.016	0.015	0.022	0.042	0.069
Q(46)	0.033	0.075	0.062	0.054	0.043	0.026	0.021	0.015	0.015	0.015	0.022	0.041	0.068
Q(47)	0.032	0.073	0.061	0.053	0.042	0.025	0.021	0.015	0.015	0.015	0.021	0.04	0.066
Q(48)	0.031	0.072	0.06	0.053	0.041	0.025	0.02	0.015	0.015	0.015	0.021	0.039	0.064
Q(49)	0.031	0.07	0.058	0.052	0.041	0.025	0.02	0.015	0.015	0.015	0.02	0.039	0.063

Q(49)	0.031	0.07	0.058	0.052	0.041	0.025	0.02	0.015	0.015	0.015	0.02	0.039	0.063
Q(50)	0.03	0.069	0.057	0.051	0.04	0.024	0.02	0.015	0.015	0.015	0.02	0.038	0.061
Q(51)	0.029	0.068	0.056	0.05	0.039	0.024	0.019	0.015	0.014	0.014	0.019	0.037	0.061
Q(52)	0.028	0.067	0.055	0.049	0.039	0.024	0.019	0.014	0.014	0.014	0.019	0.036	0.059
Q(53)	0.028	0.066	0.054	0.048	0.038	0.024	0.019	0.014	0.014	0.014	0.018	0.036	0.059
Q(54)	0.027	0.064	0.053	0.047	0.038	0.023	0.019	0.014	0.014	0.014	0.018	0.035	0.057
Q(55)	0.026	0.063	0.052	0.047	0.037	0.023	0.019	0.014	0.014	0.014	0.018	0.034	0.056
Q(56)	0.026	0.061	0.051	0.046	0.037	0.023	0.018	0.014	0.013	0.014	0.017	0.033	0.055
Q(57)	0.025	0.06	0.05	0.045	0.036	0.022	0.018	0.014	0.013	0.014	0.017	0.033	0.054
Q(58)	0.024	0.059	0.05	0.044	0.036	0.022	0.018	0.014	0.013	0.013	0.017	0.032	0.052
Q(59)	0.024	0.059	0.049	0.043	0.035	0.022	0.018	0.013	0.013	0.013	0.017	0.031	0.051
Q(60)	0.023	0.057	0.048	0.042	0.035	0.022	0.017	0.013	0.013	0.013	0.017	0.03	0.05
Q(61)	0.023	0.056	0.047	0.042	0.035	0.021	0.017	0.013	0.013	0.013	0.016	0.03	0.049
Q(62)	0.022	0.055	0.046	0.041	0.034	0.021	0.017	0.013	0.012	0.013	0.016	0.029	0.048
Q(63)	0.022	0.054	0.045	0.041	0.034	0.021	0.017	0.013	0.012	0.013	0.016	0.028	0.047
Q(64)	0.021	0.053	0.044	0.04	0.033	0.021	0.017	0.013	0.012	0.012	0.015	0.028	0.046
Q(65)	0.021	0.052	0.044	0.039	0.033	0.021	0.017	0.012	0.012	0.012	0.015	0.027	0.045
Q(66)	0.02	0.051	0.043	0.039	0.032	0.02	0.016	0.012	0.012	0.012	0.015	0.027	0.044
Q(67)	0.02	0.05	0.043	0.038	0.032	0.02	0.016	0.012	0.012	0.012	0.015	0.026	0.043
Q(68)	0.019	0.049	0.042	0.038	0.032	0.02	0.016	0.012	0.011	0.012	0.014	0.026	0.042
Q(69)	0.019	0.048	0.041	0.037	0.031	0.02	0.016	0.012	0.011	0.012	0.014	0.025	0.042
Q(70)	0.018	0.046	0.04	0.036	0.031	0.019	0.016	0.012	0.011	0.011	0.014	0.024	0.041
Q(71)	0.018	0.045	0.039	0.035	0.031	0.019	0.015	0.012	0.011	0.011	0.014	0.024	0.04
Q(72)	0.018	0.044	0.039	0.035	0.03	0.019	0.015	0.011	0.011	0.011	0.014	0.023	0.039
Q(73)	0.017	0.043	0.038	0.034	0.03	0.019	0.015	0.011	0.011	0.011	0.013	0.023	0.038
Q(74)	0.017	0.042	0.037	0.033	0.029	0.018	0.015	0.011	0.011	0.011	0.013	0.022	0.038
Q(75)	0.016	0.041	0.036	0.032	0.029	0.018	0.014	0.011	0.01	0.011	0.013	0.022	0.037
Q(76)	0.016	0.04	0.036	0.032	0.028	0.018	0.014	0.011	0.01	0.011	0.013	0.021	0.036
Q(77)	0.016	0.04	0.036	0.031	0.028	0.018	0.014	0.011	0.01	0.011	0.013	0.021	0.035
Q(78)	0.015	0.039	0.035	0.03	0.027	0.018	0.014	0.01	0.01	0.01	0.013	0.02	0.034
Q(79)	0.015	0.038	0.034	0.03	0.027	0.017	0.014	0.01	0.01	0.01	0.012	0.02	0.033
Q(80)	0.015	0.037	0.034	0.029	0.026	0.017	0.013	0.01	0.01	0.01	0.012	0.019	0.032
Q(81)	0.014	0.036	0.033	0.028	0.026	0.017	0.013	0.01	0.009	0.01	0.012	0.019	0.031
Q(82)	0.014	0.035	0.032	0.028	0.026	0.017	0.013	0.01	0.009	0.01	0.012	0.018	0.03
Q(83)	0.014	0.034	0.031	0.027	0.025	0.016	0.013	0.01	0.009	0.01	0.012	0.018	0.029
Q(84)	0.013	0.033	0.031	0.027	0.025	0.016	0.012	0.01	0.009	0.01	0.011	0.017	0.028
Q(85)	0.013	0.032	0.03	0.026	0.024	0.016	0.012	0.01	0.009	0.009	0.011	0.017	0.027
Q(86)	0.013	0.031	0.029	0.025	0.024	0.015	0.012	0.01	0.009	0.009	0.011	0.016	0.026
Q(87)	0.012	0.03	0.029	0.025	0.023	0.015	0.012	0.009	0.009	0.009	0.011	0.016	0.025
Q(88)	0.012	0.029	0.028	0.024	0.022	0.015	0.012	0.009	0.008	0.009	0.011	0.016	0.024
Q(89)	0.012	0.029	0.028	0.023	0.022	0.014	0.012	0.009	0.008	0.009	0.011	0.015	0.023
Q(90)	0.011	0.028	0.027	0.023	0.021	0.014	0.011	0.009	0.008	0.009	0.01	0.015	0.022
Q(91)	0.011	0.027	0.026	0.022	0.02	0.014	0.011	0.009	0.008	0.008	0.01	0.015	0.021
Q(92)	0.011	0.025	0.025	0.022	0.02	0.014	0.011	0.008	0.008	0.008	0.01	0.014	0.02
Q(93)	0.01	0.024	0.025	0.021	0.019	0.013	0.011	0.008	0.008	0.008	0.01	0.014	0.019
Q(94)	0.01	0.023	0.023	0.02	0.019	0.012	0.01	0.008	0.007	0.008	0.01	0.013	0.018
Q(95)	0.009	0.022	0.021	0.019	0.018	0.012	0.01	0.007	0.007	0.007	0.009	0.013	0.017
Q(96)	0.009	0.021	0.02	0.018	0.016	0.011	0.009	0.007	0.007	0.007	0.009	0.013	0.016
Q(97)	0.008	0.02	0.019	0.017	0.015	0.011	0.009	0.007	0.006	0.007	0.009	0.012	0.015
Q(98)	0.008	0.018	0.018	0.016	0.014	0.01	0.008	0.006	0.005	0.006	0.008	0.011	0.013
Q(99)	0.007	0.016	0.016	0.015	0.013	0.009	0.007	0.006	0.005	0.006	0.008	0.01	0.012
Q(99.9)	0.004	0.011	0.013	0.013	0.011	0.008	0.006	0.005	0.004	0.005	0.007	0.008	0.01

Blakesley Brook

Low-Flow Estimates from LowFlows	
www.hydrosolutions.co.uk	
Catchment Characteristics	
Region	England: Anglian
Area	(33) Great Ouse
Boundar	Imported polygon
Catchmei	33.23
Lake adjustment not included in these estimates	
Grid-resc	20
Runoff (n	227.2
BFI	0.418

	Annual	January	Februar	March	April	May	June	July	August	September	October	November	December
Qmean	0.272	0.517	0.442	0.421	0.352	0.179	0.144	0.075	0.094	0.084	0.18	0.312	0.476
Q(0.1)	7.852	4.399	6.205	3.558	8.577	2.685	3.042	1.871	2.849	2.314	3.274	3.919	5.088
Q(1)	2.403	2.543	2.063	2.139	2.222	1.118	1.087	0.418	0.844	0.668	1.632	1.994	2.418
Q(2)	1.622	1.817	1.766	1.674	1.476	0.794	0.763	0.27	0.534	0.422	1.189	1.564	1.93
Q(3)	1.304	1.597	1.533	1.424	1.376	0.643	0.512	0.201	0.373	0.304	0.851	1.312	1.719
Q(4)	1.111	1.449	1.354	1.273	1.221	0.55	0.436	0.178	0.307	0.251	0.748	1.071	1.504
Q(5)	0.942	1.4	1.255	1.159	1.103	0.504	0.355	0.163	0.261	0.212	0.624	0.95	1.332
Q(6)	0.852	1.292	1.145	1	0.975	0.457	0.333	0.15	0.227	0.185	0.564	0.885	1.238
Q(7)	0.778	1.205	1.027	0.923	0.892	0.409	0.298	0.143	0.2	0.169	0.502	0.8	1.174
Q(8)	0.722	1.131	0.962	0.878	0.825	0.37	0.274	0.135	0.183	0.16	0.463	0.758	1.056
Q(9)	0.663	1.042	0.9	0.831	0.772	0.345	0.254	0.129	0.17	0.153	0.43	0.717	1.014
Q(10)	0.616	0.987	0.864	0.788	0.722	0.329	0.233	0.125	0.156	0.146	0.399	0.682	0.939
Q(11)	0.58	0.931	0.812	0.735	0.655	0.313	0.219	0.12	0.151	0.139	0.372	0.632	0.908
Q(12)	0.545	0.915	0.777	0.707	0.61	0.295	0.206	0.117	0.145	0.132	0.339	0.601	0.857
Q(13)	0.515	0.871	0.739	0.673	0.581	0.286	0.197	0.114	0.139	0.128	0.318	0.578	0.818
Q(14)	0.485	0.837	0.712	0.647	0.547	0.276	0.189	0.111	0.133	0.123	0.299	0.542	0.767
Q(15)	0.465	0.806	0.692	0.62	0.522	0.264	0.184	0.109	0.128	0.119	0.281	0.517	0.744
Q(16)	0.445	0.783	0.664	0.598	0.487	0.258	0.176	0.107	0.123	0.115	0.268	0.489	0.731
Q(17)	0.422	0.753	0.639	0.59	0.475	0.248	0.172	0.106	0.119	0.112	0.25	0.48	0.697
Q(18)	0.404	0.726	0.613	0.569	0.458	0.237	0.168	0.105	0.116	0.109	0.232	0.468	0.687
Q(19)	0.388	0.702	0.595	0.552	0.443	0.23	0.165	0.103	0.113	0.107	0.218	0.452	0.651
Q(20)	0.37	0.677	0.584	0.531	0.426	0.223	0.161	0.101	0.111	0.104	0.205	0.432	0.628
Q(21)	0.353	0.66	0.567	0.519	0.407	0.213	0.158	0.1	0.109	0.102	0.199	0.415	0.607
Q(22)	0.339	0.635	0.539	0.492	0.393	0.208	0.156	0.099	0.107	0.099	0.191	0.396	0.593
Q(23)	0.33	0.617	0.524	0.483	0.381	0.201	0.152	0.096	0.105	0.097	0.185	0.384	0.572
Q(24)	0.317	0.604	0.507	0.473	0.362	0.196	0.15	0.095	0.103	0.095	0.176	0.366	0.558
Q(25)	0.304	0.587	0.494	0.46	0.352	0.192	0.148	0.094	0.102	0.093	0.17	0.349	0.544
Q(26)	0.295	0.575	0.478	0.45	0.343	0.186	0.144	0.093	0.1	0.091	0.164	0.338	0.527
Q(27)	0.285	0.561	0.467	0.441	0.334	0.181	0.142	0.092	0.098	0.089	0.159	0.331	0.514
Q(28)	0.277	0.555	0.449	0.428	0.325	0.178	0.139	0.091	0.095	0.088	0.154	0.321	0.497
Q(29)	0.266	0.536	0.437	0.416	0.312	0.174	0.137	0.089	0.093	0.087	0.148	0.311	0.481
Q(30)	0.26	0.529	0.421	0.406	0.301	0.173	0.136	0.089	0.093	0.085	0.144	0.303	0.471
Q(31)	0.25	0.509	0.41	0.4	0.296	0.171	0.134	0.088	0.09	0.085	0.14	0.291	0.462
Q(32)	0.241	0.499	0.403	0.391	0.29	0.168	0.132	0.087	0.089	0.084	0.136	0.282	0.453
Q(33)	0.232	0.485	0.398	0.386	0.285	0.166	0.131	0.086	0.088	0.083	0.132	0.275	0.447
Q(34)	0.222	0.476	0.39	0.378	0.278	0.163	0.13	0.085	0.087	0.081	0.128	0.263	0.439
Q(35)	0.215	0.47	0.383	0.368	0.271	0.16	0.129	0.085	0.085	0.08	0.125	0.256	0.424
Q(36)	0.208	0.465	0.375	0.359	0.266	0.157	0.127	0.084	0.084	0.079	0.12	0.245	0.412
Q(37)	0.203	0.455	0.363	0.354	0.262	0.156	0.126	0.083	0.083	0.078	0.118	0.24	0.402
Q(38)	0.198	0.445	0.357	0.347	0.257	0.153	0.124	0.082	0.082	0.077	0.113	0.23	0.394
Q(39)	0.192	0.434	0.348	0.344	0.248	0.152	0.122	0.081	0.081	0.076	0.11	0.222	0.389
Q(40)	0.187	0.419	0.341	0.336	0.243	0.15	0.121	0.08	0.08	0.075	0.108	0.216	0.377
Q(41)	0.183	0.413	0.337	0.331	0.238	0.149	0.119	0.079	0.078	0.074	0.106	0.21	0.365
Q(42)	0.177	0.404	0.332	0.327	0.233	0.147	0.118	0.079	0.077	0.074	0.104	0.205	0.358
Q(43)	0.173	0.395	0.326	0.322	0.228	0.143	0.117	0.078	0.076	0.073	0.101	0.201	0.35
Q(44)	0.169	0.388	0.32	0.317	0.223	0.142	0.115	0.077	0.075	0.073	0.097	0.193	0.34
Q(45)	0.166	0.38	0.316	0.314	0.218	0.14	0.114	0.076	0.074	0.072	0.094	0.19	0.335
Q(46)	0.162	0.369	0.308	0.305	0.214	0.138	0.113	0.075	0.073	0.071	0.092	0.186	0.328
Q(47)	0.158	0.361	0.3	0.3	0.211	0.137	0.111	0.075	0.073	0.071	0.09	0.181	0.319
Q(48)	0.155	0.353	0.294	0.297	0.208	0.135	0.11	0.074	0.072	0.07	0.088	0.177	0.31
Q(49)	0.151	0.346	0.289	0.292	0.204	0.133	0.108	0.073	0.071	0.07	0.086	0.174	0.302

Q(50)	0.148	0.338	0.285	0.287	0.202	0.131	0.108	0.072	0.07	0.069	0.085	0.171	0.293
Q(51)	0.144	0.334	0.28	0.284	0.198	0.13	0.107	0.072	0.07	0.068	0.083	0.167	0.289
Q(52)	0.14	0.33	0.277	0.28	0.195	0.129	0.106	0.071	0.069	0.068	0.081	0.164	0.282
Q(53)	0.137	0.323	0.273	0.275	0.194	0.127	0.105	0.07	0.068	0.068	0.08	0.162	0.278
Q(54)	0.133	0.315	0.267	0.269	0.192	0.126	0.104	0.07	0.068	0.067	0.079	0.157	0.27
Q(55)	0.13	0.309	0.263	0.265	0.189	0.124	0.102	0.069	0.067	0.066	0.077	0.154	0.265
Q(56)	0.128	0.304	0.26	0.261	0.188	0.121	0.101	0.068	0.067	0.066	0.076	0.149	0.26
Q(57)	0.124	0.297	0.255	0.255	0.187	0.119	0.1	0.067	0.066	0.065	0.075	0.145	0.253
Q(58)	0.12	0.293	0.251	0.249	0.184	0.118	0.099	0.067	0.065	0.064	0.074	0.141	0.246
Q(59)	0.118	0.288	0.245	0.244	0.182	0.117	0.098	0.067	0.064	0.063	0.073	0.137	0.24
Q(60)	0.114	0.283	0.242	0.243	0.18	0.115	0.096	0.066	0.064	0.063	0.073	0.134	0.235
Q(61)	0.111	0.279	0.236	0.239	0.179	0.114	0.096	0.065	0.063	0.062	0.071	0.131	0.225
Q(62)	0.109	0.272	0.231	0.234	0.176	0.113	0.094	0.065	0.062	0.061	0.07	0.129	0.221
Q(63)	0.107	0.266	0.226	0.229	0.175	0.111	0.093	0.064	0.061	0.061	0.069	0.125	0.215
Q(64)	0.104	0.262	0.22	0.224	0.172	0.111	0.092	0.063	0.06	0.06	0.068	0.122	0.211
Q(65)	0.102	0.259	0.217	0.22	0.172	0.11	0.091	0.063	0.059	0.059	0.067	0.119	0.207
Q(66)	0.099	0.252	0.214	0.216	0.168	0.108	0.09	0.062	0.059	0.058	0.066	0.118	0.203
Q(67)	0.096	0.247	0.21	0.212	0.167	0.107	0.089	0.061	0.058	0.057	0.065	0.114	0.2
Q(68)	0.094	0.241	0.207	0.209	0.165	0.106	0.088	0.06	0.057	0.057	0.064	0.112	0.197
Q(69)	0.092	0.236	0.203	0.204	0.163	0.104	0.086	0.059	0.056	0.056	0.063	0.109	0.193
Q(70)	0.089	0.226	0.199	0.202	0.162	0.103	0.085	0.059	0.056	0.055	0.062	0.107	0.19
Q(71)	0.087	0.221	0.196	0.198	0.16	0.102	0.084	0.058	0.054	0.053	0.061	0.104	0.188
Q(72)	0.085	0.215	0.193	0.194	0.159	0.1	0.084	0.057	0.053	0.052	0.06	0.101	0.183
Q(73)	0.084	0.209	0.189	0.191	0.157	0.099	0.082	0.056	0.052	0.051	0.059	0.097	0.177
Q(74)	0.082	0.206	0.185	0.187	0.157	0.098	0.081	0.055	0.051	0.05	0.058	0.095	0.174
Q(75)	0.08	0.203	0.18	0.183	0.154	0.097	0.08	0.053	0.05	0.05	0.057	0.092	0.169
Q(76)	0.077	0.199	0.179	0.179	0.152	0.095	0.078	0.052	0.05	0.049	0.057	0.09	0.166
Q(77)	0.075	0.195	0.175	0.175	0.15	0.094	0.077	0.051	0.049	0.048	0.056	0.088	0.163
Q(78)	0.074	0.191	0.173	0.173	0.148	0.093	0.075	0.051	0.048	0.048	0.055	0.086	0.16
Q(79)	0.073	0.188	0.169	0.171	0.146	0.092	0.075	0.05	0.047	0.047	0.054	0.084	0.156
Q(80)	0.071	0.182	0.166	0.167	0.142	0.09	0.074	0.049	0.046	0.046	0.053	0.082	0.15
Q(81)	0.07	0.177	0.164	0.165	0.14	0.089	0.073	0.049	0.046	0.045	0.052	0.08	0.146
Q(82)	0.068	0.174	0.162	0.161	0.138	0.087	0.072	0.048	0.045	0.045	0.051	0.078	0.141
Q(83)	0.067	0.169	0.158	0.158	0.135	0.086	0.071	0.047	0.045	0.044	0.05	0.075	0.137
Q(84)	0.065	0.166	0.155	0.155	0.133	0.084	0.069	0.047	0.044	0.044	0.049	0.074	0.133
Q(85)	0.064	0.161	0.151	0.151	0.13	0.083	0.069	0.047	0.043	0.043	0.048	0.072	0.129
Q(86)	0.062	0.159	0.149	0.148	0.128	0.081	0.068	0.046	0.043	0.043	0.047	0.07	0.126
Q(87)	0.06	0.155	0.147	0.145	0.124	0.079	0.067	0.046	0.042	0.042	0.047	0.069	0.12
Q(88)	0.058	0.153	0.143	0.141	0.121	0.078	0.066	0.045	0.042	0.041	0.046	0.068	0.116
Q(89)	0.056	0.149	0.141	0.138	0.116	0.075	0.065	0.044	0.041	0.041	0.045	0.066	0.11
Q(90)	0.054	0.144	0.136	0.135	0.112	0.074	0.065	0.043	0.04	0.04	0.045	0.065	0.105
Q(91)	0.051	0.139	0.134	0.132	0.108	0.072	0.063	0.042	0.039	0.039	0.044	0.064	0.101
Q(92)	0.049	0.131	0.13	0.13	0.106	0.071	0.062	0.041	0.038	0.039	0.043	0.062	0.096
Q(93)	0.047	0.125	0.127	0.127	0.103	0.069	0.061	0.04	0.038	0.038	0.043	0.06	0.091
Q(94)	0.046	0.12	0.118	0.123	0.1	0.067	0.058	0.039	0.037	0.037	0.042	0.058	0.087
Q(95)	0.044	0.113	0.109	0.117	0.094	0.064	0.055	0.038	0.037	0.036	0.041	0.055	0.083
Q(96)	0.042	0.108	0.105	0.112	0.081	0.06	0.05	0.037	0.036	0.035	0.04	0.052	0.077
Q(97)	0.04	0.102	0.098	0.101	0.076	0.054	0.048	0.036	0.034	0.035	0.039	0.05	0.071
Q(98)	0.037	0.092	0.091	0.093	0.073	0.049	0.044	0.033	0.029	0.033	0.037	0.046	0.062
Q(99)	0.035	0.082	0.084	0.087	0.07	0.044	0.04	0.031	0.028	0.03	0.036	0.042	0.053
Q(99.9)	0.022	0.063	0.066	0.076	0.054	0.038	0.035	0.026	0.022	0.024	0.032	0.036	0.043

River Tove

Low-Flow Estimates from LowFlows	
www.hydrosolutions.co.uk	
Catchment Characteristics	
Region	England: Anglian
Area	(33) Great Ouse
Boundar	Imported polygon
Catchmer	88.51
Lake adjustment not included in these estimates	
Grid-resc	20
Runoff (n	218.8
BFI	0.35

	Annual	January	Februar	March	April	May	June	July	August	September	October	November	December
Qmean	0.699	1.497	1.169	1.393	0.973	0.5	0.379	0.094	0.138	0.099	0.334	0.618	1.212
Q(0.1)	19.35	10.93	12.61	15.34	21.11	7.593	8.861	3.553	4.448	3.156	6.053	8.162	9.747
Q(1)	6.015	6.712	5.572	7.117	5.798	3.2	2.602	0.65	1.181	0.813	2.818	4.118	6.361
Q(2)	4.092	5.367	4.331	5.181	3.952	2.162	1.876	0.404	0.717	0.51	2.038	3.034	5.01
Q(3)	3.32	4.853	3.807	4.708	3.39	1.798	1.268	0.322	0.527	0.408	1.525	2.446	4.574
Q(4)	2.837	4.221	3.442	4.031	2.959	1.503	1.1	0.284	0.446	0.36	1.351	2.114	3.878
Q(5)	2.428	3.739	3.245	3.674	2.705	1.391	0.935	0.267	0.398	0.33	1.148	1.946	3.497
Q(6)	2.2	3.613	2.888	3.291	2.379	1.222	0.867	0.249	0.371	0.29	1.03	1.737	3.073
Q(7)	2.011	3.34	2.67	2.996	2.23	1.109	0.773	0.238	0.344	0.271	0.915	1.593	2.855
Q(8)	1.865	3.114	2.42	2.78	2.068	1.021	0.72	0.229	0.326	0.257	0.852	1.517	2.635
Q(9)	1.711	2.923	2.302	2.537	1.984	0.939	0.658	0.222	0.308	0.246	0.795	1.433	2.506
Q(10)	1.59	2.742	2.213	2.399	1.851	0.879	0.611	0.218	0.293	0.239	0.746	1.364	2.339
Q(11)	1.5	2.569	2.098	2.283	1.713	0.84	0.564	0.213	0.285	0.232	0.702	1.262	2.247
Q(12)	1.407	2.476	2.01	2.196	1.631	0.793	0.538	0.209	0.277	0.226	0.654	1.202	2.146
Q(13)	1.328	2.359	1.91	2.13	1.532	0.771	0.516	0.206	0.268	0.22	0.613	1.161	2.024
Q(14)	1.251	2.32	1.825	2.053	1.456	0.744	0.494	0.201	0.261	0.216	0.574	1.072	1.934
Q(15)	1.202	2.265	1.786	1.971	1.397	0.708	0.483	0.199	0.251	0.211	0.542	1.033	1.865
Q(16)	1.153	2.179	1.702	1.899	1.32	0.694	0.466	0.196	0.244	0.207	0.52	0.992	1.773
Q(17)	1.095	2.083	1.65	1.838	1.281	0.669	0.454	0.194	0.24	0.203	0.489	0.965	1.725
Q(18)	1.048	1.997	1.584	1.761	1.238	0.642	0.443	0.192	0.236	0.198	0.465	0.912	1.671
Q(19)	1.01	1.959	1.546	1.681	1.194	0.626	0.437	0.191	0.233	0.195	0.447	0.877	1.611
Q(20)	0.963	1.922	1.48	1.64	1.165	0.599	0.427	0.189	0.23	0.193	0.427	0.846	1.569
Q(21)	0.919	1.887	1.426	1.602	1.128	0.576	0.422	0.188	0.228	0.191	0.418	0.811	1.51
Q(22)	0.883	1.811	1.371	1.577	1.08	0.556	0.414	0.186	0.224	0.188	0.401	0.78	1.464
Q(23)	0.86	1.749	1.333	1.539	1.046	0.537	0.407	0.185	0.221	0.185	0.389	0.754	1.411
Q(24)	0.827	1.691	1.3	1.488	1.015	0.524	0.402	0.183	0.219	0.183	0.381	0.724	1.358
Q(25)	0.794	1.66	1.25	1.449	0.98	0.513	0.394	0.182	0.217	0.181	0.368	0.689	1.326
Q(26)	0.77	1.621	1.226	1.404	0.95	0.5	0.391	0.181	0.215	0.18	0.355	0.68	1.287
Q(27)	0.745	1.561	1.189	1.377	0.925	0.491	0.386	0.18	0.213	0.177	0.346	0.652	1.242
Q(28)	0.723	1.554	1.157	1.339	0.894	0.482	0.382	0.179	0.21	0.176	0.338	0.63	1.218
Q(29)	0.696	1.496	1.124	1.306	0.873	0.473	0.375	0.178	0.207	0.174	0.33	0.605	1.206
Q(30)	0.678	1.472	1.096	1.275	0.857	0.467	0.373	0.177	0.205	0.172	0.318	0.584	1.169
Q(31)	0.652	1.441	1.064	1.246	0.835	0.459	0.367	0.176	0.204	0.171	0.312	0.566	1.138
Q(32)	0.628	1.419	1.053	1.234	0.821	0.452	0.362	0.175	0.2	0.169	0.306	0.548	1.105
Q(33)	0.603	1.384	1.039	1.214	0.803	0.449	0.358	0.175	0.199	0.167	0.299	0.531	1.084
Q(34)	0.577	1.345	1.018	1.198	0.784	0.441	0.354	0.173	0.197	0.166	0.291	0.514	1.061
Q(35)	0.557	1.313	1	1.177	0.766	0.436	0.352	0.173	0.196	0.164	0.285	0.503	1.036
Q(36)	0.538	1.294	0.976	1.153	0.756	0.43	0.348	0.171	0.194	0.162	0.279	0.488	1.008
Q(37)	0.524	1.256	0.954	1.133	0.742	0.424	0.345	0.17	0.193	0.161	0.276	0.477	0.984
Q(38)	0.511	1.23	0.928	1.114	0.728	0.421	0.343	0.169	0.191	0.159	0.27	0.463	0.961
Q(39)	0.497	1.21	0.909	1.092	0.711	0.417	0.34	0.168	0.19	0.158	0.264	0.455	0.943
Q(40)	0.484	1.185	0.891	1.076	0.692	0.413	0.339	0.167	0.189	0.156	0.262	0.445	0.906
Q(41)	0.472	1.173	0.883	1.057	0.683	0.41	0.336	0.166	0.187	0.154	0.259	0.433	0.888
Q(42)	0.457	1.143	0.866	1.043	0.671	0.405	0.334	0.165	0.186	0.153	0.254	0.426	0.875
Q(43)	0.448	1.119	0.86	1.027	0.667	0.397	0.332	0.164	0.184	0.151	0.249	0.419	0.864
Q(44)	0.437	1.088	0.843	1.012	0.646	0.392	0.329	0.163	0.183	0.15	0.244	0.409	0.838
Q(45)	0.428	1.068	0.827	0.996	0.634	0.389	0.324	0.162	0.182	0.148	0.241	0.4	0.819
Q(46)	0.419	1.049	0.805	0.972	0.618	0.387	0.32	0.161	0.181	0.147	0.238	0.393	0.8
Q(47)	0.41	1.024	0.786	0.957	0.609	0.383	0.317	0.16	0.18	0.145	0.235	0.388	0.778
Q(48)	0.401	1.004	0.775	0.946	0.595	0.38	0.314	0.158	0.179	0.143	0.232	0.383	0.762
Q(49)	0.39	0.988	0.76	0.921	0.582	0.374	0.31	0.157	0.178	0.142	0.229	0.376	0.74

Q(49)	0.39	0.988	0.76	0.921	0.582	0.374	0.31	0.157	0.178	0.142	0.229	0.376	0.74
Q(50)	0.383	0.969	0.752	0.903	0.569	0.369	0.309	0.156	0.177	0.141	0.227	0.372	0.731
Q(51)	0.372	0.932	0.736	0.897	0.559	0.364	0.307	0.155	0.176	0.14	0.223	0.365	0.715
Q(52)	0.362	0.918	0.733	0.886	0.551	0.361	0.305	0.154	0.175	0.138	0.221	0.359	0.697
Q(53)	0.354	0.9	0.722	0.871	0.544	0.357	0.302	0.152	0.174	0.136	0.219	0.354	0.688
Q(54)	0.345	0.881	0.704	0.862	0.535	0.353	0.3	0.151	0.173	0.135	0.218	0.349	0.679
Q(55)	0.338	0.869	0.691	0.849	0.532	0.35	0.297	0.15	0.172	0.134	0.216	0.343	0.662
Q(56)	0.331	0.854	0.682	0.83	0.526	0.347	0.295	0.149	0.171	0.133	0.214	0.335	0.636
Q(57)	0.322	0.832	0.677	0.816	0.522	0.342	0.293	0.147	0.17	0.133	0.212	0.331	0.624
Q(58)	0.311	0.824	0.664	0.797	0.517	0.341	0.29	0.146	0.169	0.132	0.211	0.323	0.607
Q(59)	0.305	0.808	0.648	0.788	0.512	0.338	0.289	0.145	0.168	0.131	0.209	0.315	0.586
Q(60)	0.296	0.79	0.64	0.777	0.509	0.337	0.287	0.143	0.168	0.129	0.208	0.308	0.571
Q(61)	0.289	0.782	0.628	0.769	0.504	0.333	0.286	0.142	0.166	0.128	0.206	0.303	0.558
Q(62)	0.282	0.764	0.615	0.758	0.502	0.332	0.283	0.14	0.165	0.127	0.205	0.297	0.545
Q(63)	0.277	0.75	0.597	0.748	0.495	0.328	0.282	0.139	0.164	0.126	0.202	0.292	0.533
Q(64)	0.271	0.738	0.588	0.735	0.492	0.325	0.28	0.137	0.164	0.124	0.2	0.287	0.525
Q(65)	0.264	0.726	0.578	0.729	0.485	0.321	0.278	0.136	0.162	0.124	0.198	0.282	0.518
Q(66)	0.258	0.713	0.568	0.706	0.48	0.319	0.278	0.135	0.16	0.122	0.197	0.279	0.508
Q(67)	0.25	0.695	0.554	0.7	0.475	0.316	0.275	0.134	0.158	0.121	0.195	0.276	0.499
Q(68)	0.244	0.686	0.547	0.685	0.469	0.313	0.275	0.133	0.157	0.12	0.193	0.272	0.493
Q(69)	0.238	0.675	0.534	0.673	0.46	0.311	0.271	0.132	0.156	0.119	0.193	0.266	0.484
Q(70)	0.232	0.656	0.523	0.66	0.456	0.31	0.269	0.131	0.155	0.118	0.192	0.263	0.476
Q(71)	0.227	0.638	0.515	0.644	0.453	0.307	0.267	0.13	0.153	0.117	0.191	0.257	0.471
Q(72)	0.221	0.62	0.505	0.632	0.448	0.306	0.265	0.127	0.152	0.116	0.19	0.253	0.458
Q(73)	0.216	0.603	0.497	0.622	0.442	0.303	0.264	0.126	0.15	0.116	0.189	0.247	0.45
Q(74)	0.211	0.593	0.49	0.601	0.438	0.3	0.261	0.125	0.149	0.115	0.188	0.243	0.439
Q(75)	0.206	0.58	0.479	0.591	0.435	0.298	0.258	0.123	0.148	0.114	0.187	0.241	0.431
Q(76)	0.2	0.563	0.472	0.573	0.431	0.296	0.256	0.122	0.144	0.113	0.186	0.237	0.423
Q(77)	0.195	0.553	0.464	0.561	0.425	0.294	0.253	0.12	0.141	0.112	0.185	0.234	0.416
Q(78)	0.191	0.539	0.455	0.55	0.419	0.291	0.251	0.119	0.137	0.111	0.184	0.231	0.41
Q(79)	0.188	0.528	0.449	0.541	0.415	0.288	0.25	0.118	0.135	0.109	0.184	0.229	0.395
Q(80)	0.184	0.511	0.442	0.529	0.411	0.286	0.247	0.117	0.134	0.108	0.183	0.226	0.386
Q(81)	0.181	0.496	0.436	0.519	0.406	0.282	0.245	0.116	0.132	0.107	0.182	0.222	0.378
Q(82)	0.177	0.487	0.429	0.506	0.402	0.281	0.243	0.115	0.13	0.105	0.181	0.22	0.368
Q(83)	0.175	0.474	0.421	0.498	0.397	0.279	0.242	0.114	0.128	0.104	0.179	0.219	0.359
Q(84)	0.171	0.462	0.413	0.486	0.39	0.277	0.24	0.113	0.126	0.103	0.178	0.217	0.35
Q(85)	0.167	0.452	0.407	0.478	0.385	0.274	0.236	0.112	0.124	0.103	0.176	0.215	0.342
Q(86)	0.163	0.444	0.399	0.47	0.379	0.27	0.235	0.11	0.123	0.101	0.175	0.212	0.334
Q(87)	0.159	0.434	0.396	0.457	0.37	0.265	0.234	0.109	0.122	0.1	0.174	0.209	0.325
Q(88)	0.154	0.428	0.388	0.451	0.363	0.263	0.231	0.108	0.12	0.099	0.172	0.206	0.314
Q(89)	0.149	0.42	0.385	0.44	0.356	0.259	0.23	0.106	0.119	0.099	0.17	0.204	0.301
Q(90)	0.143	0.412	0.373	0.432	0.351	0.255	0.228	0.105	0.117	0.098	0.169	0.202	0.289
Q(91)	0.136	0.403	0.364	0.424	0.347	0.252	0.227	0.104	0.115	0.097	0.167	0.2	0.28
Q(92)	0.132	0.384	0.356	0.416	0.34	0.246	0.224	0.102	0.113	0.096	0.165	0.197	0.274
Q(93)	0.126	0.366	0.345	0.404	0.335	0.242	0.22	0.1	0.11	0.095	0.163	0.195	0.268
Q(94)	0.121	0.352	0.327	0.392	0.327	0.237	0.217	0.098	0.107	0.093	0.159	0.192	0.262
Q(95)	0.116	0.337	0.295	0.377	0.309	0.233	0.21	0.097	0.104	0.093	0.154	0.19	0.255
Q(96)	0.112	0.322	0.281	0.361	0.273	0.225	0.201	0.094	0.101	0.09	0.152	0.187	0.245
Q(97)	0.106	0.304	0.272	0.333	0.26	0.213	0.194	0.092	0.095	0.088	0.146	0.182	0.239
Q(98)	0.099	0.284	0.26	0.311	0.25	0.203	0.182	0.075	0.086	0.084	0.138	0.174	0.223
Q(99)	0.092	0.266	0.248	0.294	0.243	0.189	0.172	0.072	0.081	0.078	0.125	0.16	0.208
Q(99.9)	0.057	0.218	0.214	0.269	0.225	0.177	0.129	0.062	0.055	0.068	0.111	0.121	0.178

Appendix C Effluent Sanitary Chemistry

Water Quality of Process Effluent

Sample Range from 04/01/2021 to 01/09/2025

Parameters	pH	Ammoniacal Nitrogen as N	Total Phosphorus as P	Suspended Solids	Chloride as Cl	BOD
Units	pH	(mg/l)	(mg/l)	(mg/l)	(mg/l)	(mg/l)
Average	7.1	0.6	2.7	6.5	635	6.5
90-percentile	7.6	1.2	3.4	9.2	857	7.6
Number of samples	686	687	685	685	687	677
Standard deviation	0.4	0.8	0.6	2.8	161.9	2.9

Correlation Coefficients (Pearson)

Parameters	Correlation	Number of samples
Effluent Flow:Ammonical-N	0.0306	147
Effluent Flow:BOD	0.0765	144
Effluent Flow:Total SS	-0.084	146
Effluent Flow:COD	-0.087	147
Effluent Flow:Total Phosphorus	-0.262	147
Effluent Flow:Chloride	-0.200	147

Appendix D Results from H1 Assessment

Caswell Stream

Release Concentrations of Substances Present in Discharges to Water

Please list all Substances released to Water for each Release Point identified in the previous page.

Which type of assessment method are you using?
(See help box & H1 Annex D for information)

Method:

Reference:

Number	Substance	Meas'ment Method	Operating Mode (% of Year)	Average Concentration in the Effluent (AA): Conc. µg/l	Average Concentration in the Effluent (AA): Meas'ment Basis	Maximum Concentration in the Effluent (Max): Conc. µg/l	Maximum Concentration in the Effluent (Max): Meas'ment Basis	Annual Rate kg/yr	Significant Load (PHS Only) kg/year
e.g.	chromium	Estimated*	continuous	0.20	annual avg	0.20	15 minute	380	1
1	Chloride	Spot	100.0%	635428.53	Annual Avg	947400	95th percentile	##########	
2	Cadmium and i	Spot	100.0%	0.11	Annual Avg	0.1	95th percentile	0.002428272	5
3	Chromium III (9	Spot	100.0%	0.26	Annual Avg	0.5	95th percentile	0.005739552	
4	Chromium VI (9	Spot	100.0%	0.26	Annual Avg	0.5	95th percentile	0.005739552	
5	Copper	Spot	100.0%	7.52	Annual Avg	12.66	95th percentile	0.166005504	
6	Lead and it's co	Spot	100.0%	1.16	Annual Avg	2.38	95th percentile	0.025607232	
7	Nickel and its c	Spot	100.0%	1.97	Annual Avg	2.6	95th percentile	0.043488144	
8	Zinc	Spot	100.0%	26.06	Annual Avg	48.41	95th percentile	0.575279712	
9	Arsenic	Spot	100.0%	0.96	Annual Avg	1.52	95th percentile	0.021192192	
10	Mercury and its	Spot	100.0%	0.19	Annual Avg	0.2	95th percentile	0.004194288	1

Water Impacts - Fresh Water Releases

Apply Test 1 (See Guidance) and Calculate Process Contributions of Emissions to Water

This table applies Test 1 and also estimates the Process Contribution for Freshwater releases, this is calculated after dilution into the relevant surface water type for each emission to water listed in the inventory, according to the release point parameters input earlier. If you have more accurate data obtained through dilution modelling, this may be entered as indicated and will be used instead of the estimated PC. Any releases which 'Pass' Test 1 are screened out at this point.

Substance	Annual Avg EQS: Release µg/l	Annual Avg EQS: EQS µg/l	Annual Avg EQS: Release conc < 10% EQS (Test 1)	MAC EQS: Release µg/l	MAC EQS: MAC µg/l	MAC EQS: Release conc < 10% EQS (Test 1)
e.g.						
[Caswell Outfall] Arsenic (Caswell Brook)	0.9600	50.0000	Pass	1.5200		N/A
[Caswell Outfall] Cadmium and its compounds (≥ 200 mg/l CaCO3) (Caswell Brook)	0.1100	0.2500	Fail	0.1000	1.5	Pass
[Caswell Outfall] Chloride (Caswell Brook)	635428.5300	##########	Fail	947400.0000		N/A
[Caswell Outfall] Chromium III (95%ile) (dissolved) (Caswell Brook)	0.2600	4.7000	Pass	0.5000	32	Pass
[Caswell Outfall] Chromium VI (95%ile) (dissolved) (Caswell Brook)	0.2600	3.4000	Pass	0.5000		N/A
[Caswell Outfall] Copper (Caswell Brook)	7.5200	1.0000	Fail	12.6600		N/A
[Caswell Outfall] Lead and it's compounds (Caswell Brook)	1.1600	1.2000	Fail	2.3800	14	Fail
[Caswell Outfall] Mercury and its compounds (Caswell Brook)	0.1900		N/A	0.2000	0.07	Fail
[Caswell Outfall] Nickel and its compounds (Caswell Brook)	1.9700	4.0000	Fail	2.6000	34	Pass
[Caswell Outfall] Zinc (Caswell Brook)	26.0600	10.9000	Fail	48.4100		N/A

Water Impact Screening - Fresh Water Releases

Apply Test 2

This page applies Test 2 and displays the Process Contribution as a proportion of the EQS. Emissions with PCs that are less than 4% of the EQS can be screened from further assessment as they are likely to have an insignificant impact.

Substance	Annual Avg EQS (Annual Avg EQS) µg/l	PC (Annual Avg EQS) µg/l	Modelled PC (Annual Avg EQS)	% PC of EQS (Annual Avg EQS) %	PC < 4% of EQS? Test 2	MAC EQS µg/l	PC (MAC EQS) µg/l	Modelled PC (MAC EQS)	% PC of MAC %	PC < 4% of MAC? Test 2
Cadmium and its compounds (≥ 200 mg/l CaCO3) (Caswell B	0.25	0.0453		18.12	Fail	1.5	0.0583		3.89	Pass
Chloride (Caswell Brook)	250000	##########		104.66	Fail		##########		-	Pass
Copper (Caswell Brook)	1	3.0965		309.65	Fail		7.3850		-	Pass
Lead and it's compounds (Caswell Brook)	1.2	0.4776		39.80	Fail	14	1.3883		9.92	Fail
Mercury and its compounds (Caswell Brook)		0.0782			Pass	0.07	0.1167		167	Fail
Nickel and its compounds (Caswell Brook)	4	0.8112		20.28	Fail	34	1.5167		4.47	Fail
Zinc (Caswell Brook)	10.9	10.7306		98.45	Fail		28.2392		-	Pass

Water Impact Screening (Predicted Environmental Concentration) - Fresh Water Releases

Apply Tests 3 and 4 and identify which releases may need more Detailed Modelling of Emissions/Discharges to Water

This page applies Tests 3, 4a and 4b and displays the Predicted Environmental Concentrations in relation to the backgound pollutant levels and the AA or MAC EQS. Any substances that pass all 3 of these tests can be screened out. Substances failing any of the tests must be modelled. Note that releases that have passed Tests1 and 2 are insignificant are not shown as they are already screened out.

Number	Substance	Bkgrnd Conc. µg/l	PC (Annual Avg EQS) µg/l	PEC (Annual Avg EQS) µg/l	(PEC - BC)/ EQS	PEC -BC >10% AA EQS Test 3	% PEC of EQS %	PEC >100% AA EQS Test 4a	PC (MAC* EQS) µg/l	PEC (MAC* EQS) µg/l	% PEC of MAC %	PEC >100% MAC Test 4b
	e.g.	200										
2	Cadmium and its compounds (≥ 200 mg/l CaCO3) ((	0.01	0.0453	0.0512	16.5%	Fail	20.5	Pass	0.0584	0.0626	4.17	Pass
1	Chloride (Caswell Brook)	48.01818	261,647	261,675	104.7%	Fail	105	Fail	552,650	0	-	Pass
5	Copper (Caswell Brook)	1.439368	3.10	3.95	250.4%	Fail	394	Fail	7.39	0	-	Pass
6	Lead and it's compounds (Caswell Brook)	1.457143	0.478	1.34	-10.2%	Pass	111	Fail	1.39	2.00	14.3	Pass
10	Mercury and its compounds (Caswell Brook)	0.01	0.0783	0		Pass	-	Pass	0.117	0.121	173	Fail
7	Nickel and its compounds (Caswell Brook)	2.514737	0.812	2.30	-5.6%	Pass	57.3	Pass	1.52	2.57	7.55	Pass
8	Zinc (Caswell Brook)	9.926364	10.8	16.6	60.9%	Fail	152	Fail	28.3	0	-	Pass

Caswell Brook

Release Concentrations of Substances Present in Discharges to Water

Please list all Substances released to Water for each Release Point identified in the previous page.

Which type of assessment method are you using?
(See help box & H1 Annex D for information)

Method:

Reference:

Number	Substance	Meas'ment Method	Operating Mode (% of Year)	Average Concentration in the Effluent (AA): Conc. µg/l	Average Concentration in the Effluent (AA): Meas'ment Basis	Maximum Concentration in the Effluent (Max): Conc. µg/l	Maximum Concentration in the Effluent (Max): Meas'ment Basis	Annual Rate kg/yr	Significant Load (PHS Only) kg/year
e.g.	chromium	Estimated*	continuous	0.20	annual avg	0.20	15 minute	380	1
1	Chloride	Spot	100.0%	635428.53	Annual Avg	947400	95th percentile	##########	
2	Cadmium and i	Spot	100.0%	0.11	Annual Avg	0.1	95th percentile	0.002428272	5
3	Chromium III (9	Spot	100.0%	0.26	Annual Avg	0.5	95th percentile	0.005739552	
4	Chromium VI (9	Spot	100.0%	0.26	Annual Avg	0.5	95th percentile	0.005739552	
5	Copper	Spot	100.0%	7.52	Annual Avg	12.66	95th percentile	0.166005504	
6	Lead and it's c	Spot	100.0%	1.16	Annual Avg	2.38	95th percentile	0.025607232	
7	Nickel and its c	Spot	100.0%	1.97	Annual Avg	2.6	95th percentile	0.043488144	
8	Zinc	Spot	100.0%	26.06	Annual Avg	48.41	95th percentile	0.575279712	
9	Arsenic	Spot	100.0%	0.96	Annual Avg	1.52	95th percentile	0.021192192	
10	Mercury and its	Spot	100.0%	0.19	Annual Avg	0.2	95th percentile	0.004194288	1

Water Impacts - Fresh Water Releases

Apply Test 1 (See Guidance) and Calculate Process Contributions of Emissions to Water

This table applies Test 1 and also estimates the Process Contribution for Freshwater releases, this is calculated after dilution into the relevant surface water type for each emission to water listed in the inventory, according to the release point parameters input earlier. If you have more accurate data obtained through dilution modelling, this may be entered as indicated and will be used instead of the estimated PC. Any releases which 'Pass' Test 1 are screened out at this point.

Substance	Annual Avg EQS: Release µg/l	Annual Avg EQS: EQS µg/l	Annual Avg EQS: Release conc < 10% EQS	MAC EQS: Release µg/l	MAC EQS: MAC µg/l	MAC EQS: Release conc < 10% EQS
e.g.			Test 1			Test 1
[Caswell Outfall] Arsenic (Caswell Brook)	0.9600	50.0000	Pass	1.5200		N/A
[Caswell Outfall] Cadmium and its compounds (≥ 200 mg/l CaCO3) (Caswell Brook)	0.1100	0.2500	Fail	0.1000	1.5	Pass
[Caswell Outfall] Chloride (Caswell Brook)	635428.5300	##########	Fail	947400.0000		N/A
[Caswell Outfall] Chromium III (95%ile) (dissolved) (Caswell Brook)	0.2600	4.7000	Pass	0.5000	32	Pass
[Caswell Outfall] Chromium VI (95%ile) (dissolved) (Caswell Brook)	0.2600	3.4000	Pass	0.5000		N/A
[Caswell Outfall] Copper (Caswell Brook)	7.5200	1.0000	Fail	12.6600		N/A
[Caswell Outfall] Lead and it's compounds (Caswell Brook)	1.1600	1.2000	Fail	2.3800	14	Fail
[Caswell Outfall] Mercury and its compounds (Caswell Brook)	0.1900		N/A	0.2000	0.07	Fail
[Caswell Outfall] Nickel and its compounds (Caswell Brook)	1.9700	4.0000	Fail	2.6000	34	Pass
[Caswell Outfall] Zinc (Caswell Brook)	26.0600	10.9000	Fail	48.4100		N/A

Water Impact Screening - Fresh Water Releases

Apply Test 2

This page applies Test 2 and displays the Process Contribution as a proportion of the EQS. Emissions with PCs that are less than 4% of the EQS can be screened from further assessment as they are likely to have an insignificant impact.

Substance	Annual Avg EQS: Annual Avg EQS µg/l	Annual Avg EQS: PC µg/l	Annual Avg EQS: Modelled PC	Annual Avg EQS: % PC of EQS %	Annual Avg EQS: PC < 4% of EQS? Test 2	MAC EQS: MAC EQS µg/l	MAC EQS: PC µg/l	MAC EQS: Modelled PC	MAC EQS: % PC of MAC %	MAC EQS: PC < 4% of MAC? Test 2
Cadmium and its compounds (≥ 200 mg/l CaCO3) (Caswell B	0.25	0.0079		3.18	Pass	1.5	0.0135		0.898	Pass
Chloride (Caswell Brook)	250000	##########		18.34	Fail		##########		-	Pass
Copper (Caswell Brook)	1	0.5427		54.27	Fail		1.7042		-	Pass
Lead and it's compounds (Caswell Brook)	1.2	0.0837		6.98	Fail	14	0.3204		2.29	Pass
Mercury and its compounds (Caswell Brook)		0.0137			Pass	0.07	0.0269		38.5	Fail
Nickel and its compounds (Caswell Brook)	4	0.1422		3.55	Pass	34	0.3500		1.03	Pass
Zinc (Caswell Brook)	10.9	1.8806		17.25	Fail		6.5167		-	Pass

Water Impact Screening (Predicted Environmental Concentration) - Fresh Water Releases

Apply Tests 3 and 4 and identify which releases may need more Detailed Modelling of Emissions/Discharges to Water

This page applies Tests 3, 4a and 4b and displays the Predicted Environmental Concentrations in relation to the backgound pollutant levels and the AA or MAC EQS. Any substances that pass all 3 of these ests can be screened out. Substances failing any of the tests must be modelled. Note that releases that have passed Tests1 and 2 are insignificant are not shown as they are already screened out.

Number	Substance	Bkgrnd Conc. µg/l (e.g. 200)	Annual Avg EQS: PC µg/l	Annual Avg EQS: PEC µg/l	Annual Avg EQS: (PEC - BC)/ EQS	Annual Avg EQS: PEC -BC >10% AA EQS Test 3	% PEC of EQS %	PEC >100% AA EQS Test 4a	MAC* EQS: PC µg/l	MAC* EQS: PEC µg/l	MAC* EQS: % PEC of MAC %	PEC >100% MAC Test 4b
1	Chloride (Caswell Brook)	48.01818	45,856	45,904	18.3%	Fail	18.4	Pass	127,535	0	-	Pass
5	Copper (Caswell Brook)	1.439368	0.543	1.99	54.3%	Fail	198	Fail	1.71	0	-	Pass
6	Lead and it's compounds (Caswell Brook)	1.457143	0.0838	1.55	7.0%	Pass	128	Fail	0.321	1.59	11.3	Pass
10	Mercury and its compounds (Caswell Brook)	0.01	0.0138	0		Pass	-	Pass	0.0270	0.0356	50.9	Pass
8	Zinc (Caswell Brook)	9.926364	1.89	11.9	17.3%	Fail	108	Fail	6.52	0	-	Pass

Blakesley Brook

Release Concentrations of Substances Present in Discharges to Water

Please list all Substances released to Water for each Release Point identified in the previous page.

Which type of assessment method are you using?
(See help box & H1 Annex D for information)
Method:
Reference:

Number	Substance	Meas'ment Method	Operating Mode (% of Year)	Average Concentration in the Effluent (AA) Conc. µg/l	Average Concentration in the Effluent (AA) Meas'ment Basis	Maximum Concentration in the Effluent (Max) Conc. µg/l	Maximum Concentration in the Effluent (Max) Meas'ment Basis	Annual Rate kg/yr	Significant Load (PHS Only) kg/year
e.g.	chromium	Estimated*	continuous	0.20	annual avg	0.20	15 minute	380	1
1	Chloride	Spot	100.0%	635428.53	Annual Avg	947400	95th percentile	##########	
2	Cadmium and i	Spot	100.0%	0.11	Annual Avg	0.1	95th percentile	0.002428272	5
3	Chromium III (9	Spot	100.0%	0.26	Annual Avg	0.5	95th percentile	0.005739552	
4	Chromium VI (9	Spot	100.0%	0.26	Annual Avg	0.5	95th percentile	0.005739552	
5	Copper	Spot	100.0%	7.52	Annual Avg	12.66	95th percentile	0.166005504	
6	Lead and it's co	Spot	100.0%	1.16	Annual Avg	2.38	95th percentile	0.025607232	
7	Nickel and its c	Spot	100.0%	1.97	Annual Avg	2.6	95th percentile	0.043488144	
8	Zinc	Spot	100.0%	26.06	Annual Avg	48.41	95th percentile	0.575279712	
9	Arsenic	Spot	100.0%	0.96	Annual Avg	1.52	95th percentile	0.021192192	
10	Mercury and its	Spot	100.0%	0.19	Annual Avg	0.2	95th percentile	0.004194288	1

Water Impacts - Fresh Water Releases

Apply Test 1 (See Guidance) and Calculate Process Contributions of Emissions to Water

his table applies Test 1 and also estimates the Process Contribution for Freshwater releases, this is calculated after dilution into the relevant surface water ype for each emission to water listed in the inventory, according to the release point parameters input earlier. If you have more accurate data obtained through ilution modelling, this may be entered as indicated and will be used instead of the estimated PC. Any releases which 'Pass' Test 1 are screened out at this oint.

Substance	Annual Avg EQS Release µg/l	Annual Avg EQS EQS µg/l	Annual Avg EQS Release conc < 10% EQS Test 1	MAC EQS Release µg/l	MAC EQS MAC µg/l	MAC EQS Release conc < 10% EQS Test 1
e.g.						
[Caswell Outfall] Arsenic (Caswell Brook)	0.9600	50.0000	Pass	1.5200		N/A
[Caswell Outfall] Cadmium and its compounds (≥ 200 mg/l CaCO3) (Caswell Brook)	0.1100	0.2500	Fail	0.1000	1.5	Pass
[Caswell Outfall] Chloride (Caswell Brook)	635428.5300	##########	Fail	947400.0000		N/A
[Caswell Outfall] Chromium III (95%ile) (dissolved) (Caswell Brook)	0.2600	4.7000	Pass	0.5000	32	Pass
[Caswell Outfall] Chromium VI (95%ile) (dissolved) (Caswell Brook)	0.2600	3.4000	Pass	0.5000		N/A
[Caswell Outfall] Copper (Caswell Brook)	7.5200	1.0000	Fail	12.6600		N/A
[Caswell Outfall] Lead and it's compounds (Caswell Brook)	1.1600	1.2000	Fail	2.3800	14	Fail
[Caswell Outfall] Mercury and its compounds (Caswell Brook)	0.1900		N/A	0.2000	0.07	Fail
[Caswell Outfall] Nickel and its compounds (Caswell Brook)	1.9700	4.0000	Fail	2.6000	34	Pass
[Caswell Outfall] Zinc (Caswell Brook)	26.0600	10.9000	Fail	48.4100		N/A

Water Impact Screening - Fresh Water Releases

Apply Test 2

his page applies Test 2 and displays the Process Contribution as a proportion of the EQS. Emissions with PCs that are less than 4% of the EQS can be creened from further assessment as they are likely to have an insignificant impact.

Substance	Annual Avg EQS: Annual Avg EQS µg/l	PC µg/l	Modelled PC	% PC of EQS %	PC < 4% of EQS? Test 2	MAC EQS: MAC EQS µg/l	PC µg/l	Modelled PC	% PC of MAC %	PC < 4% of MAC? Test 2
Cadmium and its compounds (≥ 200 mg/l CaCO3) (Caswell B	0.25	0.0017		0.69	Pass	1.5	0.0031		0.206	Pass
Chloride (Caswell Brook)	250000	9,950.7823		3.98	Pass		##########		-	Pass
Copper (Caswell Brook)	1	0.1178		11.78	Fail		0.3904		-	Pass
Lead and it's compounds (Caswell Brook)	1.2	0.0182		1.51	Pass	14	0.0734		0.525	Pass
Mercury and its compounds (Caswell Brook)		0.0030			Pass	0.07	0.0062		8.82	Fail
Nickel and its compounds (Caswell Brook)	4	0.0309		0.77	Pass	34	0.0802		0.236	Pass
Zinc (Caswell Brook)	10.9	0.4081		3.74	Pass		1.4928		-	Pass

Water Impact Screening (Predicted Environmental Concentration) - Fresh Water Releases

Apply Tests 3 and 4 and identify which releases may need more Detailed Modelling of Emissions/Discharges to Water

This page applies Tests 3, 4a and 4b and displays the Predicted Environmental Concentrations in relation to the backgound pollutant levels and the AA or MAC EQS. Any substances that pass all 3 of these tests can be screened out. Substances failing any of the tests must be modelled. Note that releases that have passed Tests1 and 2 are insignificant are not shown as they are already screened out.

Number	Substance	Bkgrnd Conc. µg/l	Annual Avg EQS: PC µg/l	PEC µg/l	(PEC - BC)/ EQS	PEC -BC >10% AA EQS Test 3	% PEC of EQS %	PEC >100% AA EQS Test 4a	MAC* EQS: PC µg/l	PEC µg/l	% PEC of MAC %	PEC >100% MAC Test 4b
	e.g.	200										
5	Copper (Caswell Brook)	1.439368	0.118	1.56	11.8%	Fail	156	Fail	0.391	0	-	Pass
10	Mercury and its compounds (Caswell Brook)	0.01	0.00298	0		Pass	-	Pass	0.00617	0.0162	23.1	Pass

River Tove

Release Concentrations of Substances Present in Discharges to Water

Please list all Substances released to Water for each Release Point identified in the previous page.

Which type of assessment method are you using?
(See help box & H1 Annex D for information)
Method:
Reference:

Number	Substance	Meas'ment Method	Operating Mode (% of Year)	Average Concentration in the Effluent (AA) Conc. µg/l	Average Concentration in the Effluent (AA) Meas'ment Basis	Maximum Concentration in the Effluent (Max) Conc. µg/l	Maximum Concentration in the Effluent (Max) Meas'ment Basis	Annual Rate kg/yr	Significant Load (PHS Only) kg/year
e.g.	chromium	Estimated*	continuous	0.20	annual avg	0.20	15 minute	380	1
1	Chloride	Spot	100.0%	635428.53	Annual Avg	947400	95th percentile	###########	
2	Cadmium and i	Spot	100.0%	0.11	Annual Avg	0.1	95th percentile	0.002428272	5
3	Chromium III (S	Spot	100.0%	0.26	Annual Avg	0.5	95th percentile	0.005739552	
4	Chromium VI (S	Spot	100.0%	0.26	Annual Avg	0.5	95th percentile	0.005739552	
5	Copper	Spot	100.0%	7.52	Annual Avg	12.66	95th percentile	0.166005504	
6	Lead and it's c	Spot	100.0%	1.16	Annual Avg	2.38	95th percentile	0.025607232	
7	Nickel and its c	Spot	100.0%	1.97	Annual Avg	2.6	95th percentile	0.043488144	
8	Zinc	Spot	100.0%	26.06	Annual Avg	48.41	95th percentile	0.575279712	
9	Arsenic	Spot	100.0%	0.96	Annual Avg	1.52	95th percentile	0.021192192	
10	Mercury and its	Spot	100.0%	0.19	Annual Avg	0.2	95th percentile	0.004194288	1

Water Impacts - Fresh Water Releases

Apply Test 1 (See Guidance) and Calculate Process Contributions of Emissions to Water

This table applies Test 1 and also estimates the Process Contribution for Freshwater releases. this is calculated after dilution into the relevant surface water type for each emission to water listed in the inventory, according to the release point parameters input earlier. If you have more accurate data obtained through dilution modelling, this may be entered as indicated and will be used instead of the estimated PC. Any releases which 'Pass' Test 1 are screened out at this point.

Substance	Annual Avg EQS Release µg/l	Annual Avg EQS EQS µg/l	Annual Avg EQS Release conc < 10% EQS Test 1	MAC EQS Release µg/l	MAC EQS MAC µg/l	MAC EQS Release conc < 10% EQS Test 1
e.g.						
[Caswell Outfall] Arsenic (Caswell Brook)	0.9600	50.0000	Pass	1.5200		N/A
[Caswell Outfall] Cadmium and its compounds (≥ 200 mg/l CaCO3) (Caswell Brook)	0.1100	0.2500	Fail	0.1000	1.5	Pass
[Caswell Outfall] Chloride (Caswell Brook)	635428.5300	##########	Fail	947400.0000		N/A
[Caswell Outfall] Chromium III (95%ile) (dissolved) (Caswell Brook)	0.2600	4.7000	Pass	0.5000	32	Pass
[Caswell Outfall] Chromium VI (95%ile) (dissolved) (Caswell Brook)	0.2600	3.4000	Pass	0.5000		N/A
[Caswell Outfall] Copper (Caswell Brook)	7.5200	1.0000	Fail	12.6600		N/A
[Caswell Outfall] Lead and it's compounds (Caswell Brook)	1.1600	1.2000	Fail	2.3800	14	Fail
[Caswell Outfall] Mercury and its compounds (Caswell Brook)	0.1900		N/A	0.2000	0.07	Fail
[Caswell Outfall] Nickel and its compounds (Caswell Brook)	1.9700	4.0000	Fail	2.6000	34	Pass
[Caswell Outfall] Zinc (Caswell Brook)	26.0600	10.9000	Fail	48.4100		N/A

Water Impact Screening - Fresh Water Releases

Apply Test 2

This page applies Test 2 and displays the Process Contribution as a proportion of the EQS. Emissions with PCs that are less than 4% of the EQS can be screened from further assessment as they are likely to have an insignificant impact.

	Annual Avg EQS					MAC EQS				
Substance	Annual Avg EQS µg/l	PC µg/l	Modelled PC	% PC of EQS %	PC < 4% of EQS? Test 2	MAC EQS µg/l	PC µg/l	Modelled PC	% PC of MAC %	PC < 4% of MAC? Test 2
Cadmium and its compounds (≥ 200 mg/l CaCO3) (Caswell B	0.25	0.0007		0.26	Pass	1.5	0.0012		0.0796	Pass
Chloride (Caswell Brook)	250000	3,811.4822		1.52	Pass		##########		-	Pass
Copper (Caswell Brook)	1	0.0451		4.51	Fail		0.1510		-	Pass
Lead and it's compounds (Caswell Brook)	1.2	0.0070		0.58	Pass	14	0.0284		0.203	Pass
Mercury and its compounds (Caswell Brook)		0.0011			Pass	0.07	0.0024		3.41	Pass
Nickel and its compounds (Caswell Brook)	4	0.0118		0.30	Pass	34	0.0310		0.0912	Pass
Zinc (Caswell Brook)	10.9	0.1563		1.43	Pass		0.5773		-	Pass

Water Impact Screening (Predicted Environmental Concentration) - Fresh Water Releases

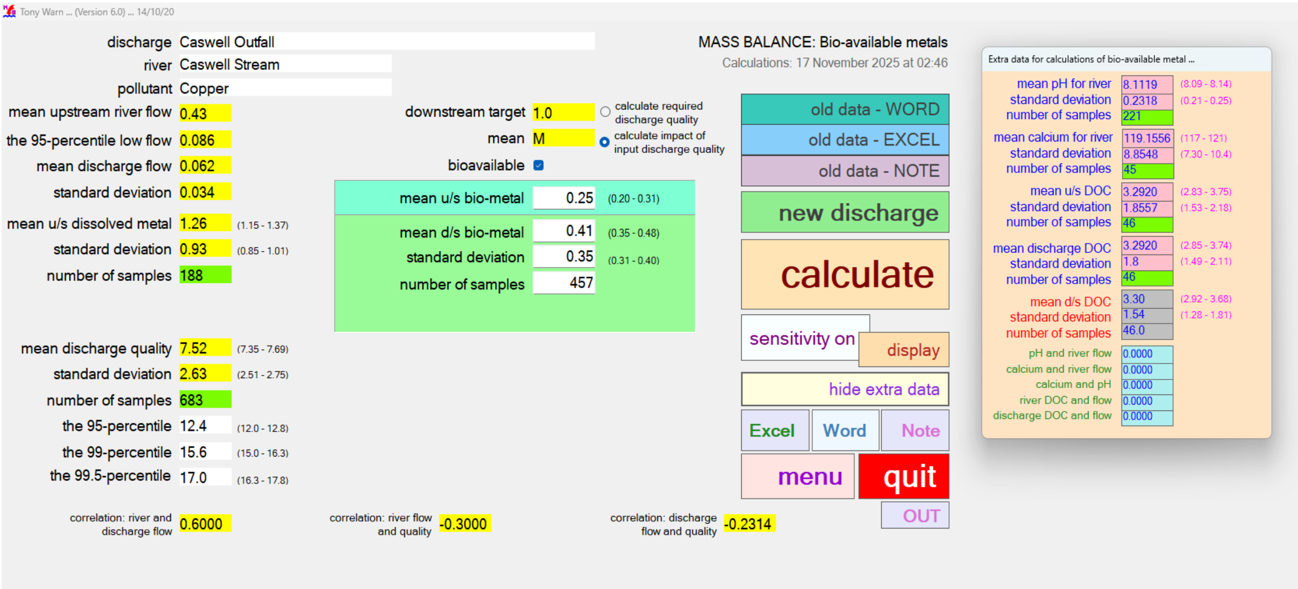
Apply Tests 3 and 4 and identify which releases may need more Detailed Modelling of Emissions/Discharges to Water

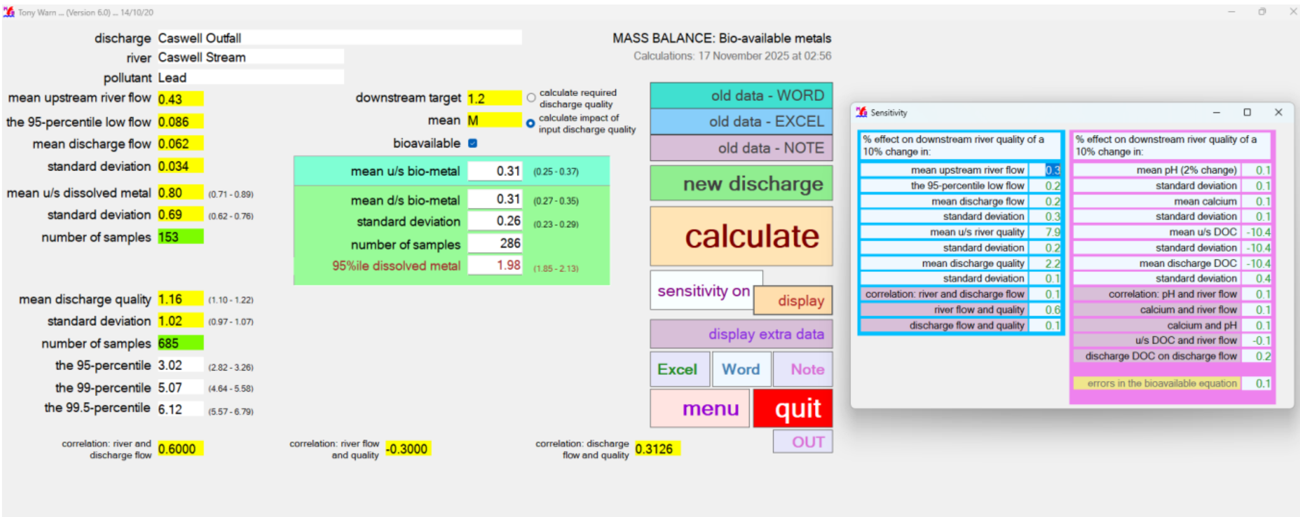
This page applies Tests 3, 4a and 4b and displays the Predicted Environmental Concentrations in relation to the backgound pollutant levels and the AA or MAC EQS. Any substances that pass all 3 of these tests can be screened out. Substances failing any of the tests must be modelled. Note that releases that have passed Tests1 and 2 are insignificant are not shown as they are already screened out.

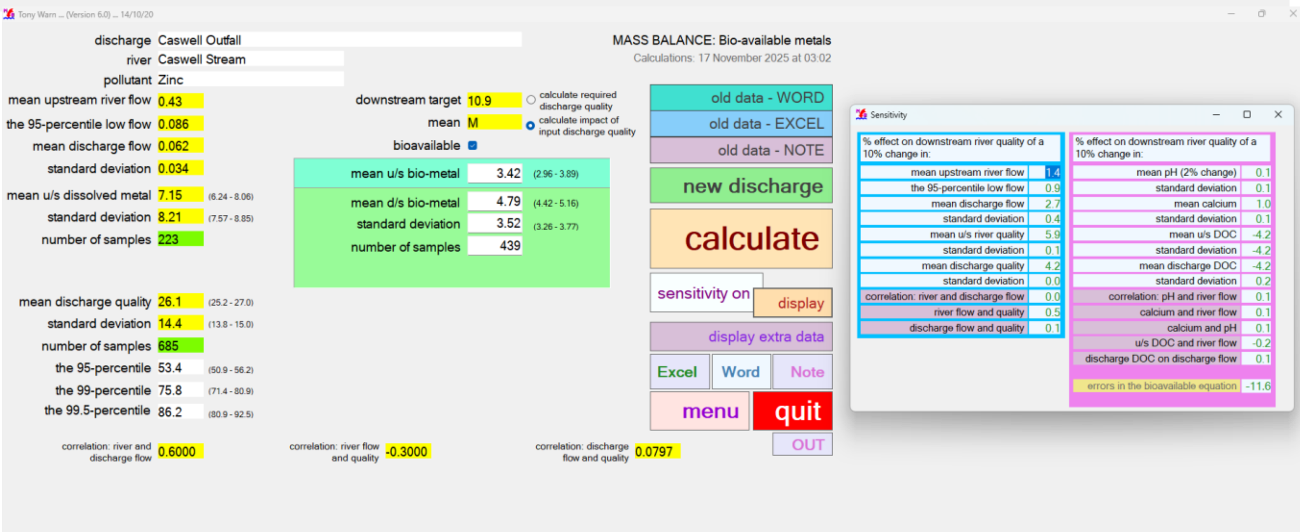
			Annual Avg EQS						MAC* EQS			
Number	Substance	Bkgrnd Conc. µg/l	PC µg/l	PEC µg/l	(PEC - BC)/ EQS	PEC -BC >10% AA EQS	% PEC of EQS %	PEC >100% AA EQS	PC µg/l	PEC µg/l	% PEC of MAC %	PEC >100% MAC
	e.g.	200				Test 3		Test 4a				Test 4b
5	Copper (Caswell Brook)	1.439368	0.0452	1.49	4.5%	Pass	148	Fail	0.151	0	-	Pass

Appendix E Monte-Carlo Results – Non-Sanitary

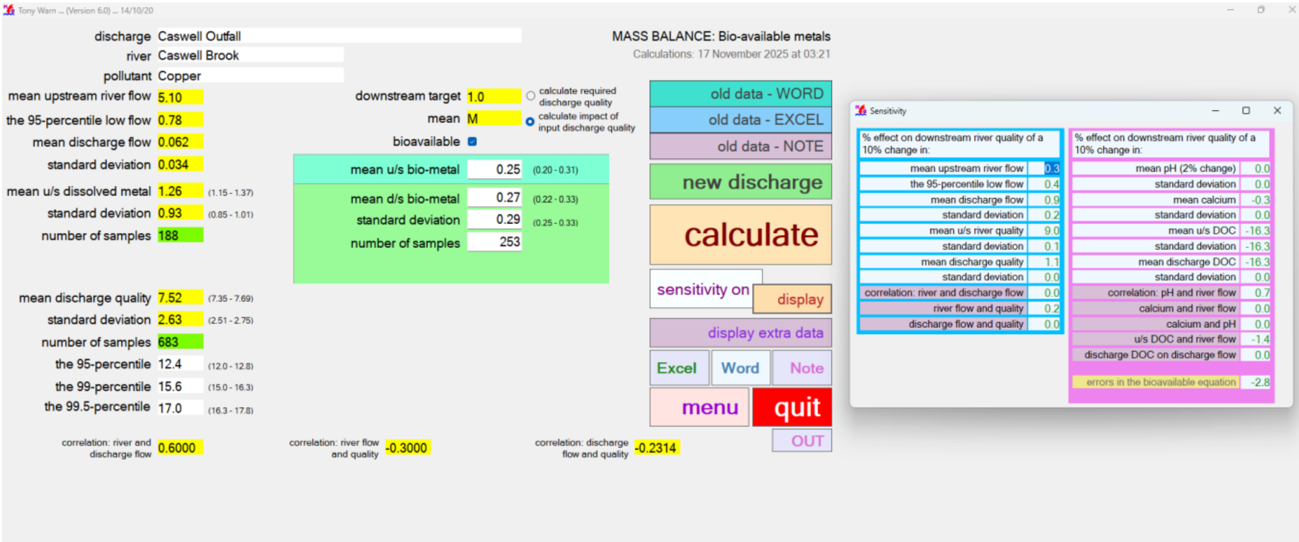
Caswell Stream

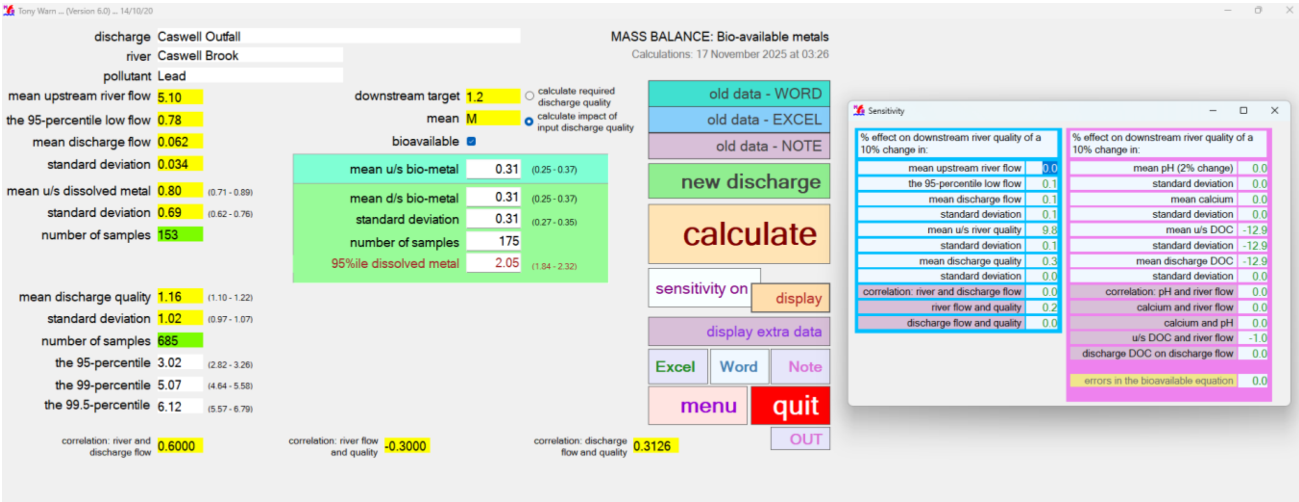


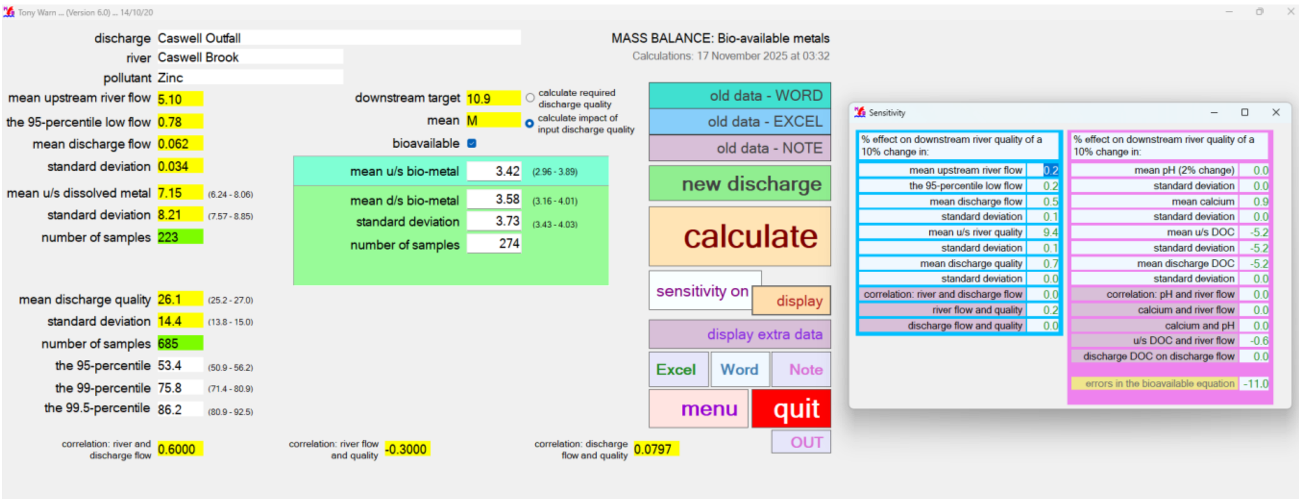




Caswell Brook

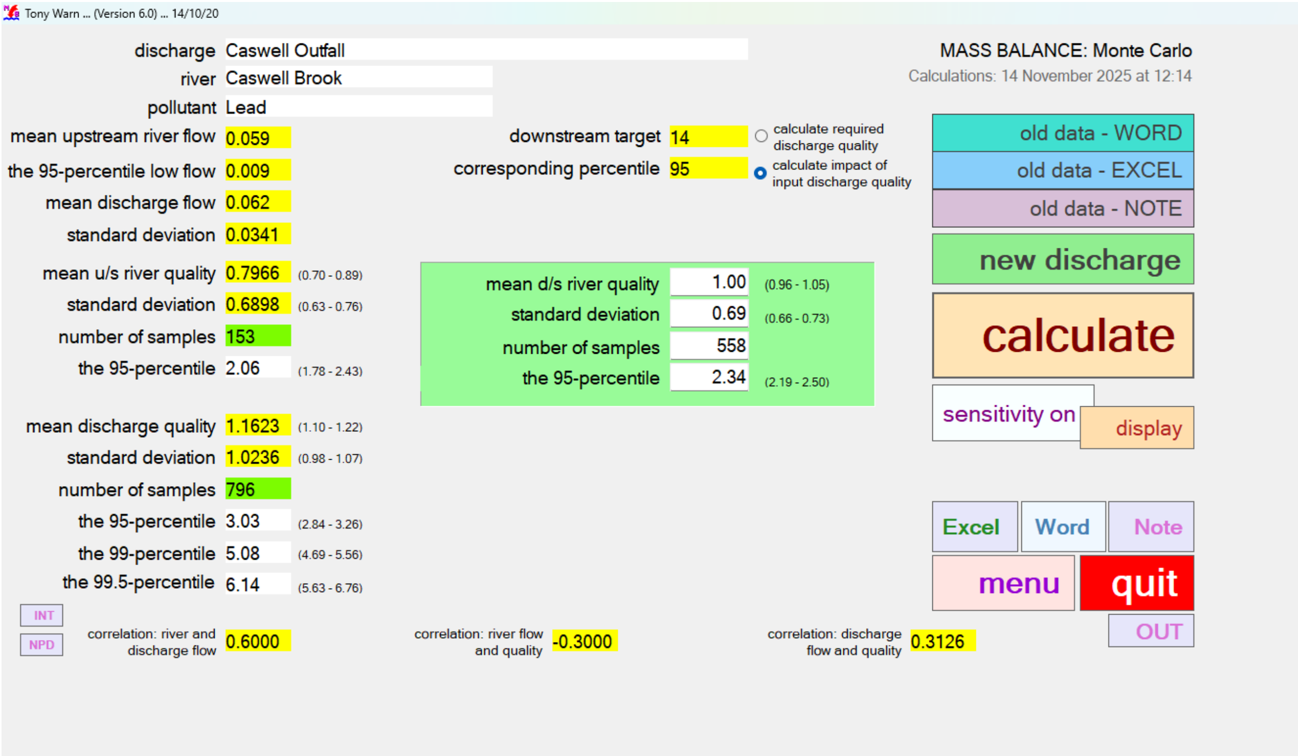




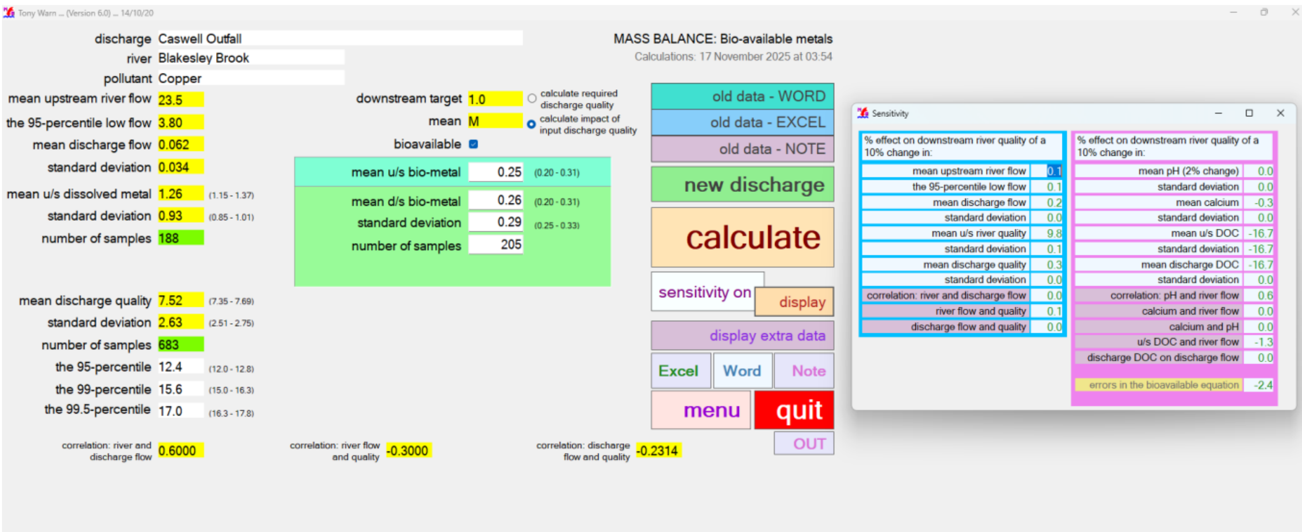


Caswell Brook

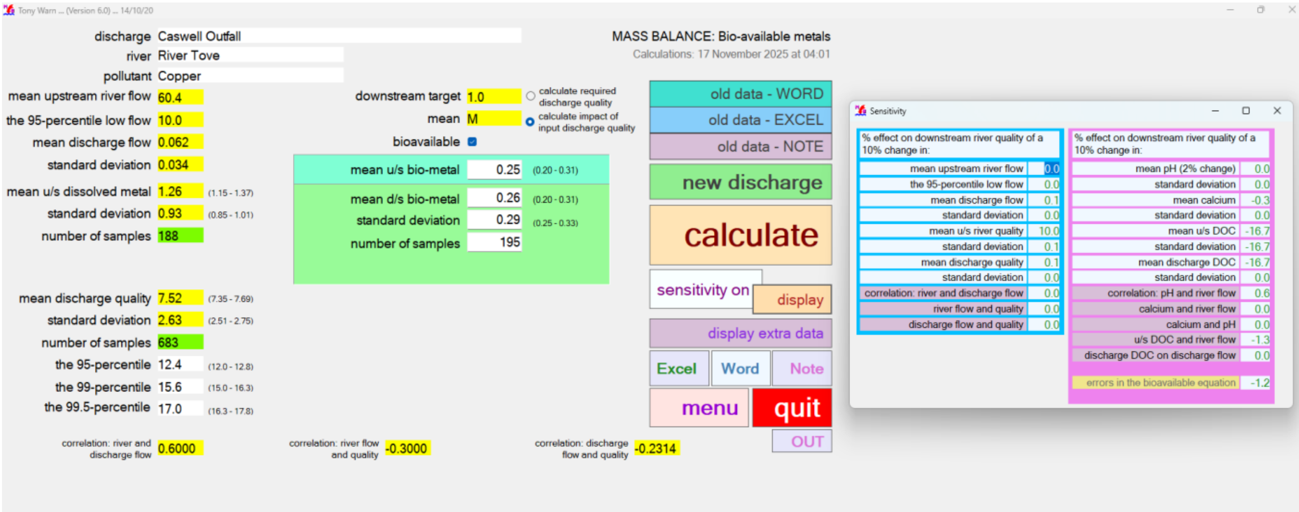
Lead – 95th percentile



Blakesley Brook

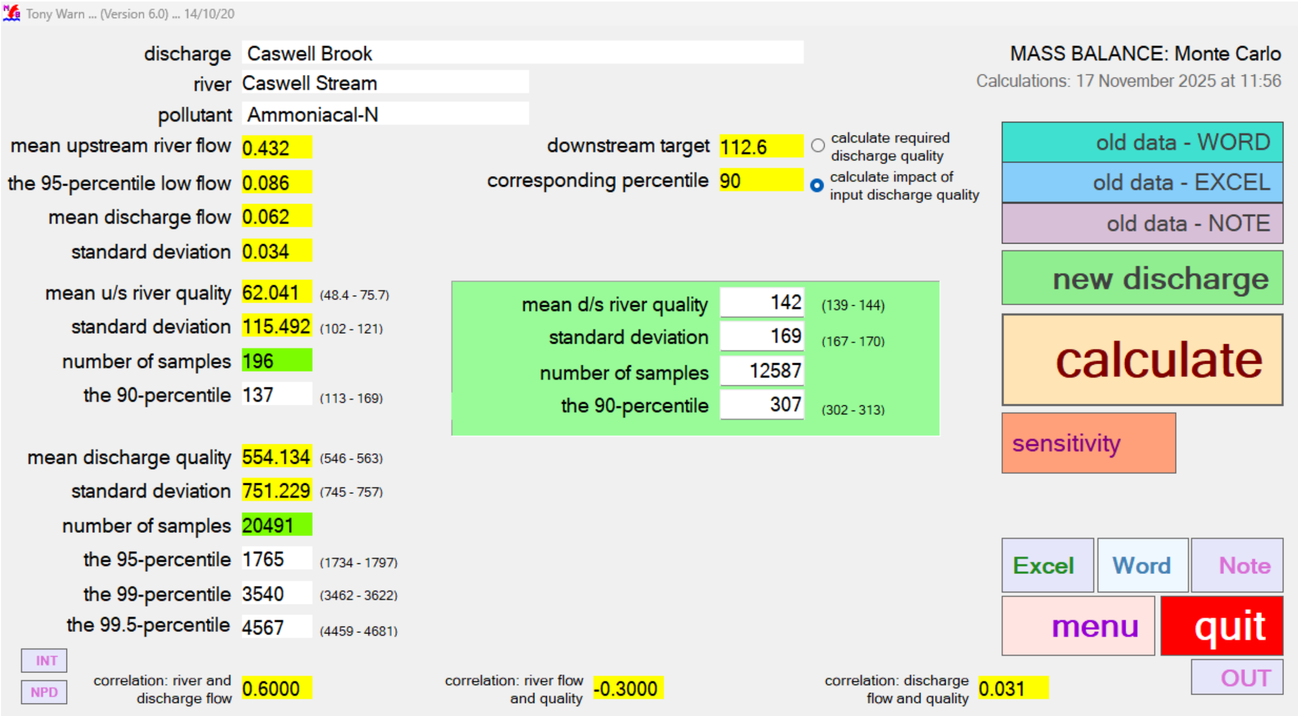


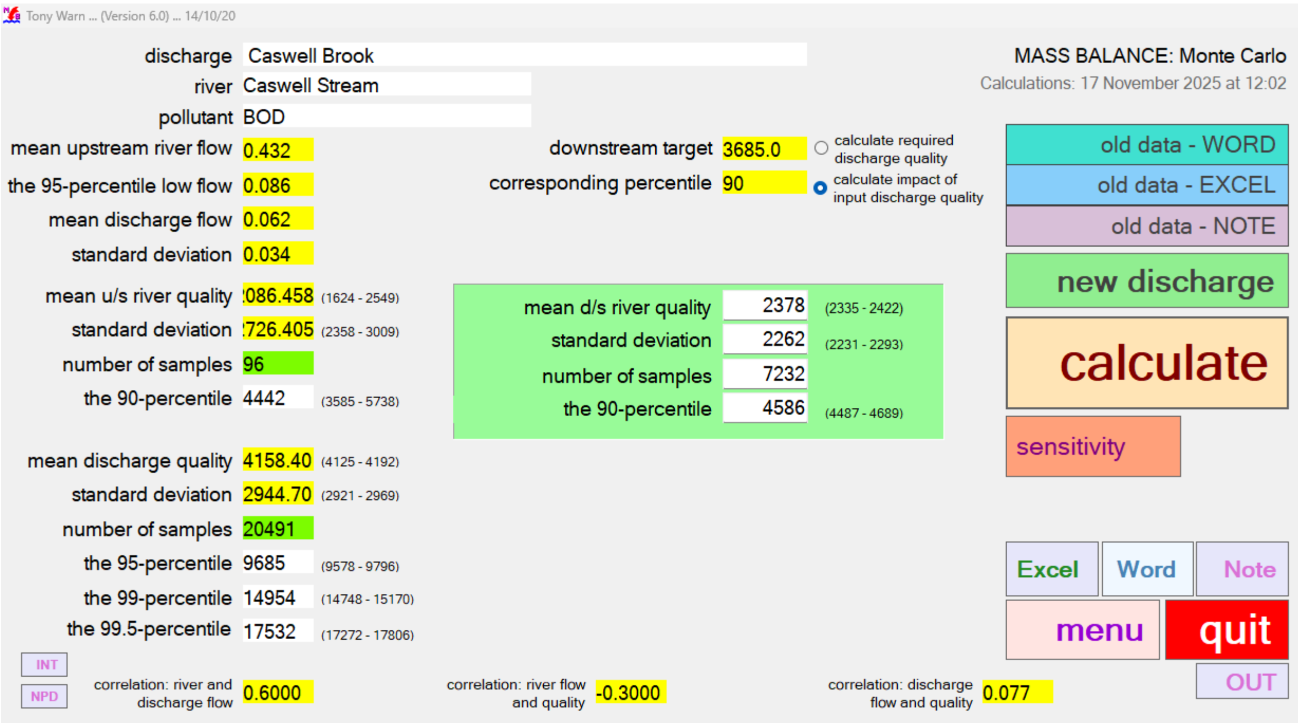
River Tove

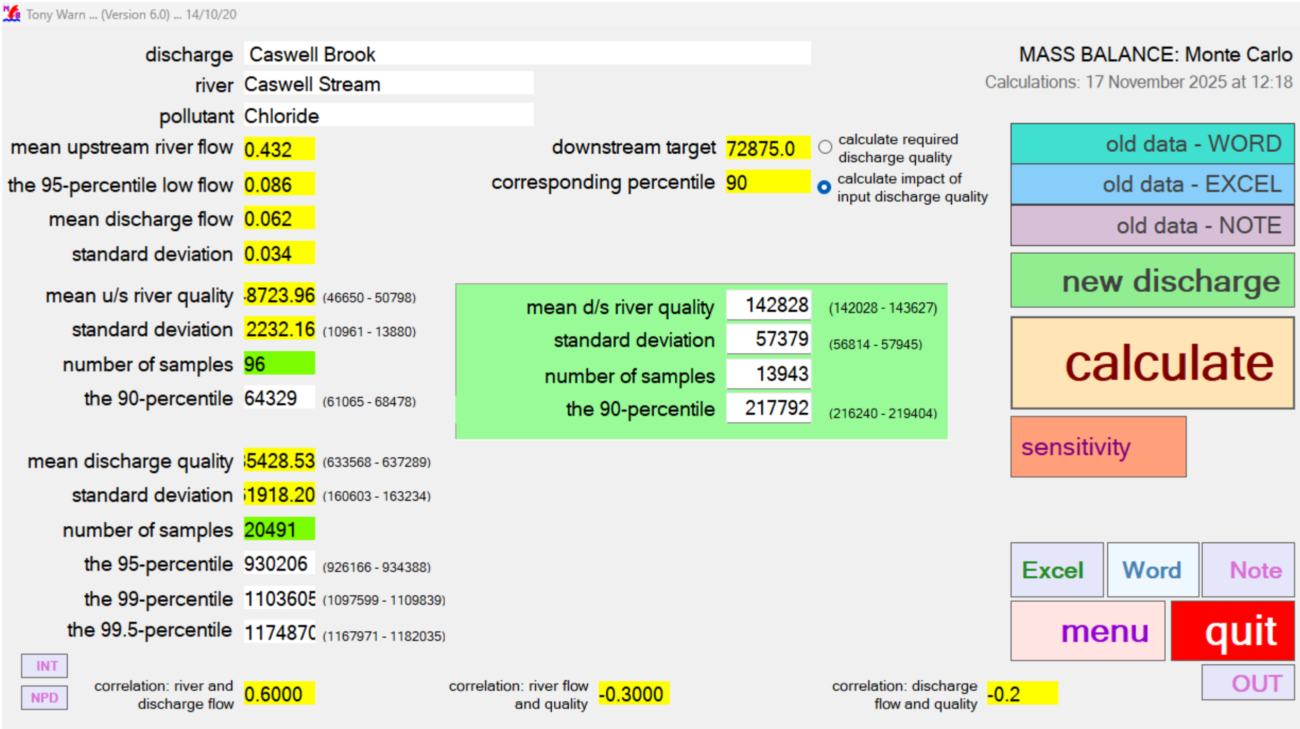

discharge Caswell Outfall
river River Tove
pollutant Copper
mean upstream river flow 60.4
the 95-percentile low flow 10.0
mean discharge flow 0.062
standard deviation 0.034
mean u/s dissolved metal 1.26 (1.15 - 1.37)
standard deviation 0.93 (0.85 - 1.01)
number of samples 188
mean discharge quality 7.52 (7.35 - 7.69)
standard deviation 2.63 (2.51 - 2.75)
number of samples 683
the 95-percentile 12.4 (12.0 - 12.8)
the 99-percentile 15.6 (15.0 - 16.3)
the 99.5-percentile 17.0 (16.3 - 17.8)
correlation: river and discharge flow 0.6000
downstream target 1.0
mean M
bioavailable
calculate required discharge quality
calculate impact of input discharge quality
mean u/s bio-metal 0.25 (0.20 - 0.31)
mean d/s bio-metal 0.26 (0.20 - 0.31)
standard deviation 0.29 (0.25 - 0.33)
number of samples 195
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2314
MASS BALANCE: Bio-available metals
Calculations: 17 November 2025 at 04:01
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity on
display
display extra data
Excel
Word
Note
menu
quit
OUT
Sensitivity
% effect on downstream river quality of a 10% change in:
mean upstream river flow 0.0
the 95-percentile low flow 0.0
mean discharge flow 0.1
standard deviation 0.0
mean u/s river quality 10.0
standard deviation 0.1
mean discharge quality 0.1
standard deviation 0.0
correlation: river and discharge flow 0.0
river flow and quality 0.0
discharge flow and quality 0.0
% effect on downstream river quality of a 10% change in:
mean pH (2% change) 0.0
standard deviation 0.0
mean calcium -0.3
standard deviation 0.0
mean u/s DOC -16.7
standard deviation -16.7
mean discharge DOC -16.7
standard deviation 0.0
correlation: pH and river flow 0.6
calcium and river flow 0.0
calcium and pH 0.0
u/s DOC and river flow -1.3
discharge DOC on discharge flow 0.0
errors in the bioavailable equation -1.2

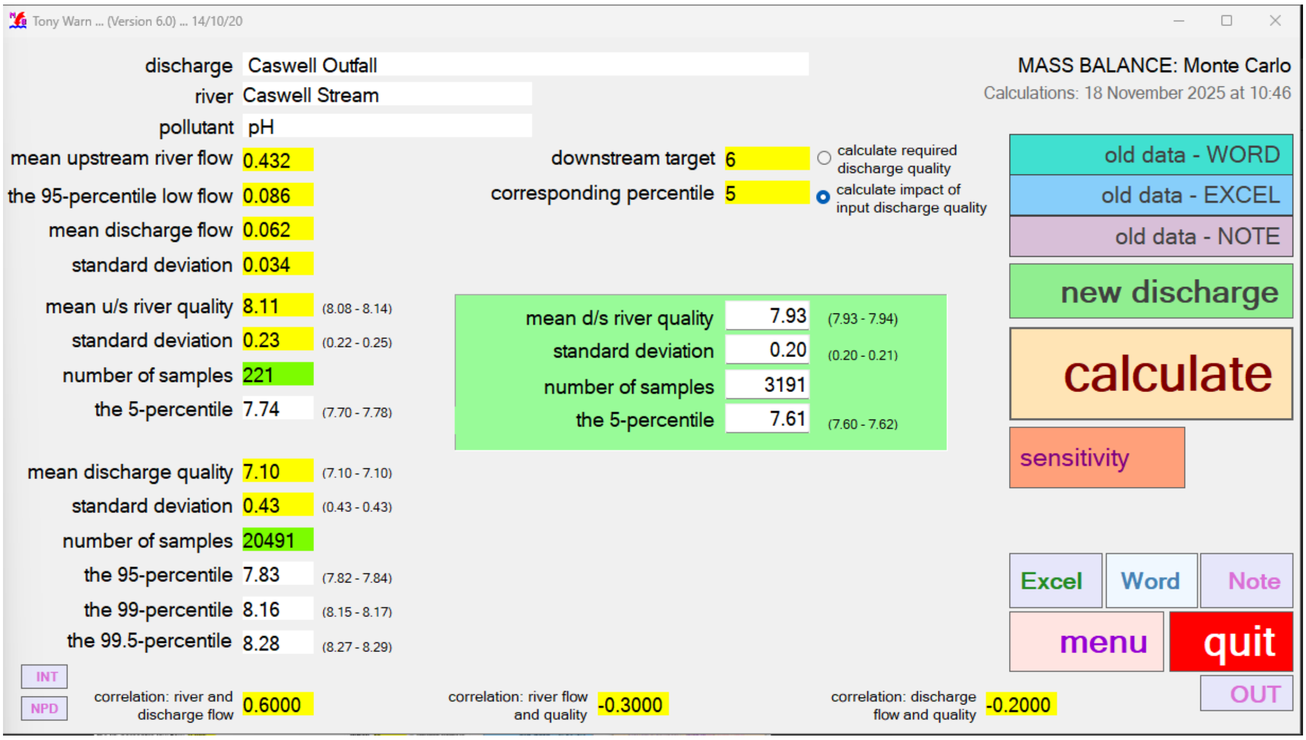
Appendix F Monte-Carlo Results – Sanitary

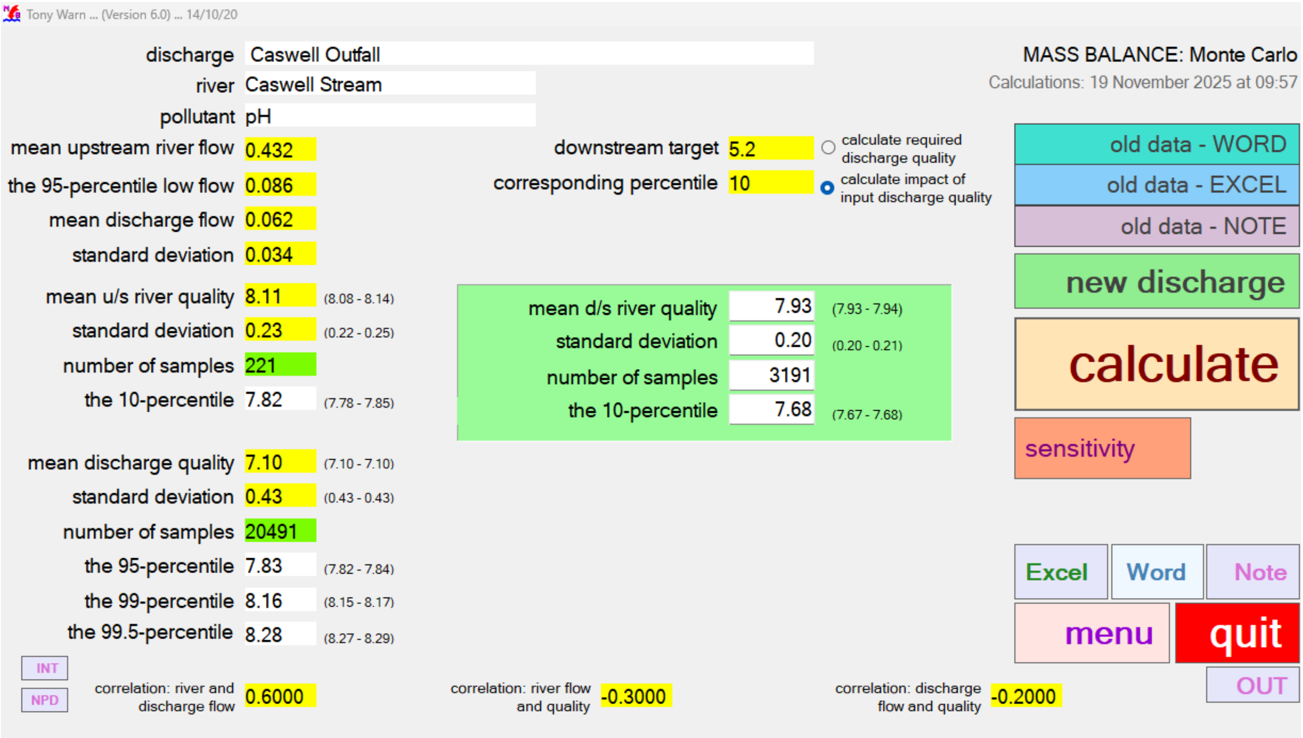
Caswell Stream

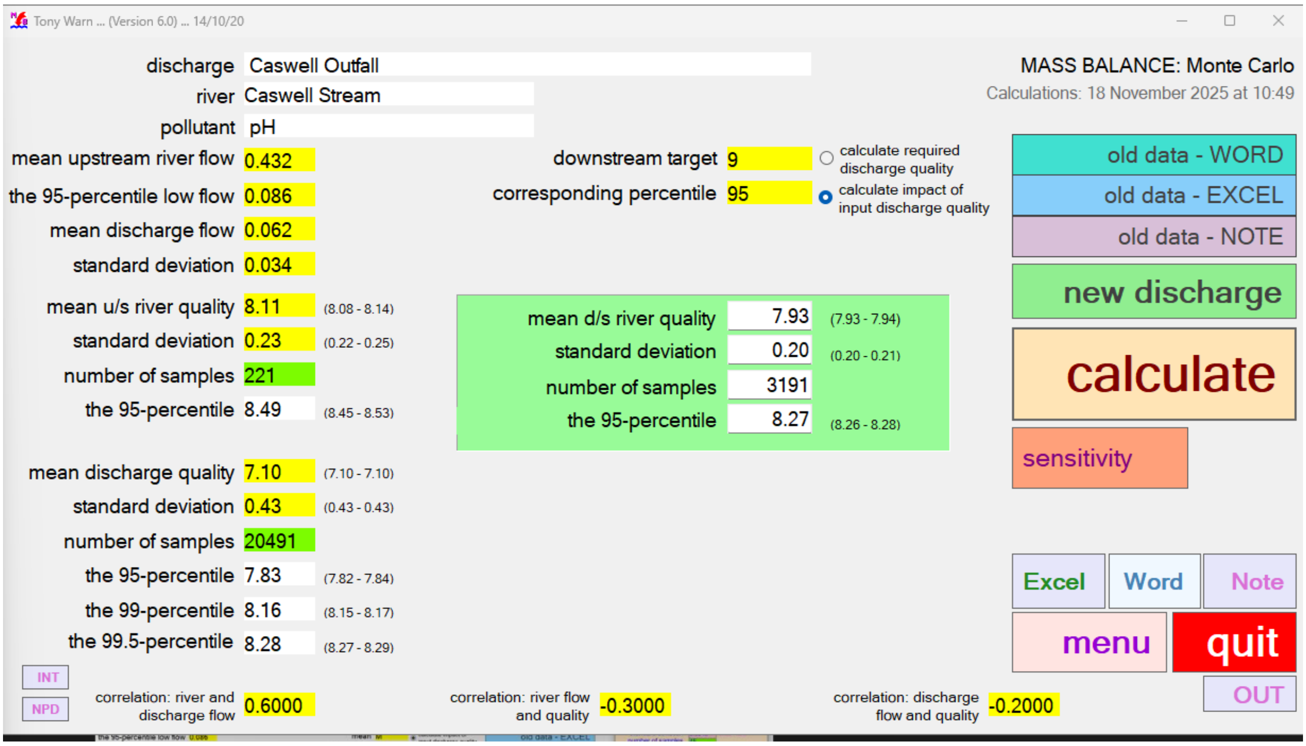


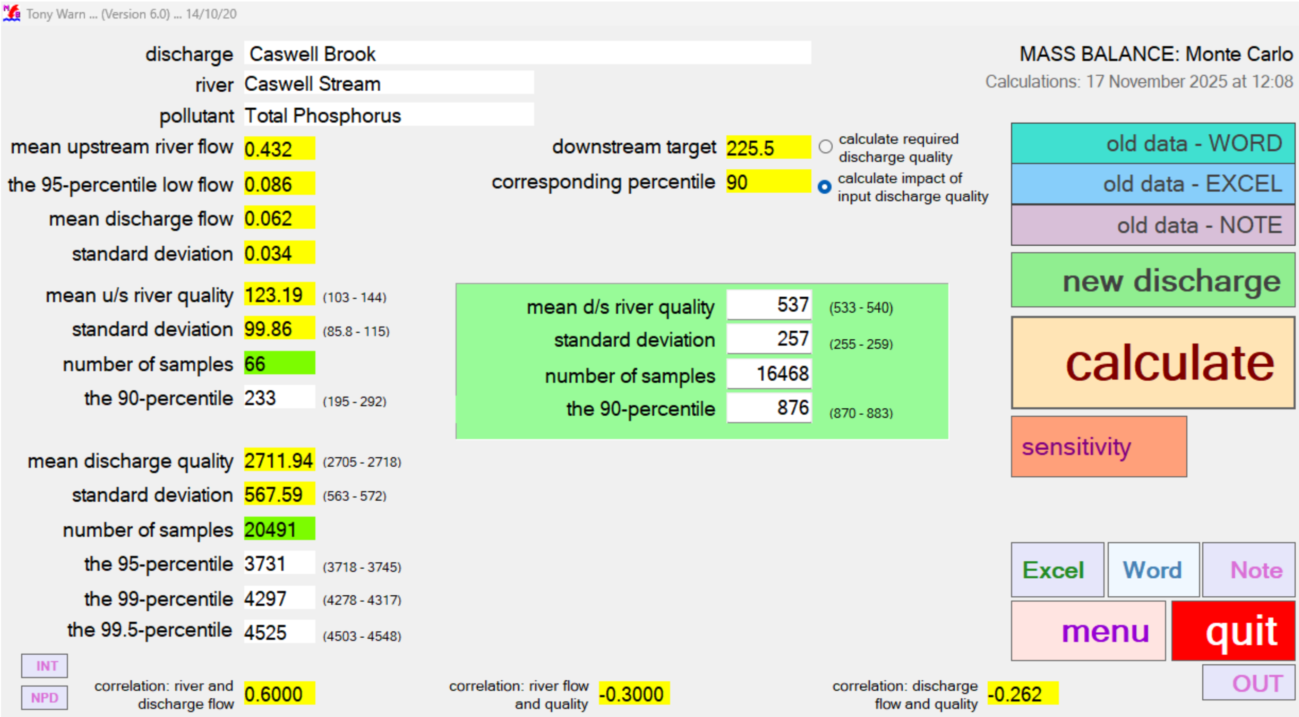



Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Brook
river Caswell Stream
pollutant Chloride
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 12:18
mean upstream river flow 0.432
the 95-percentile low flow 0.086
mean discharge flow 0.062
standard deviation 0.034
downstream target 72875.0
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8723.96 (46650 - 50798)
standard deviation 2232.16 (10961 - 13880)
number of samples 96
the 90-percentile 64329 (61065 - 68478)
mean d/s river quality 142828 (142028 - 143627)
standard deviation 57379 (56814 - 57945)
number of samples 13943
the 90-percentile 217792 (216240 - 219404)
mean discharge quality 5428.53 (633568 - 637289)
standard deviation 1918.20 (160603 - 163234)
number of samples 20491
the 95-percentile 930206 (926166 - 934388)
the 99-percentile 1103605 (1097599 - 1109839)
the 99.5-percentile 1174870 (1167971 - 1182035)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2

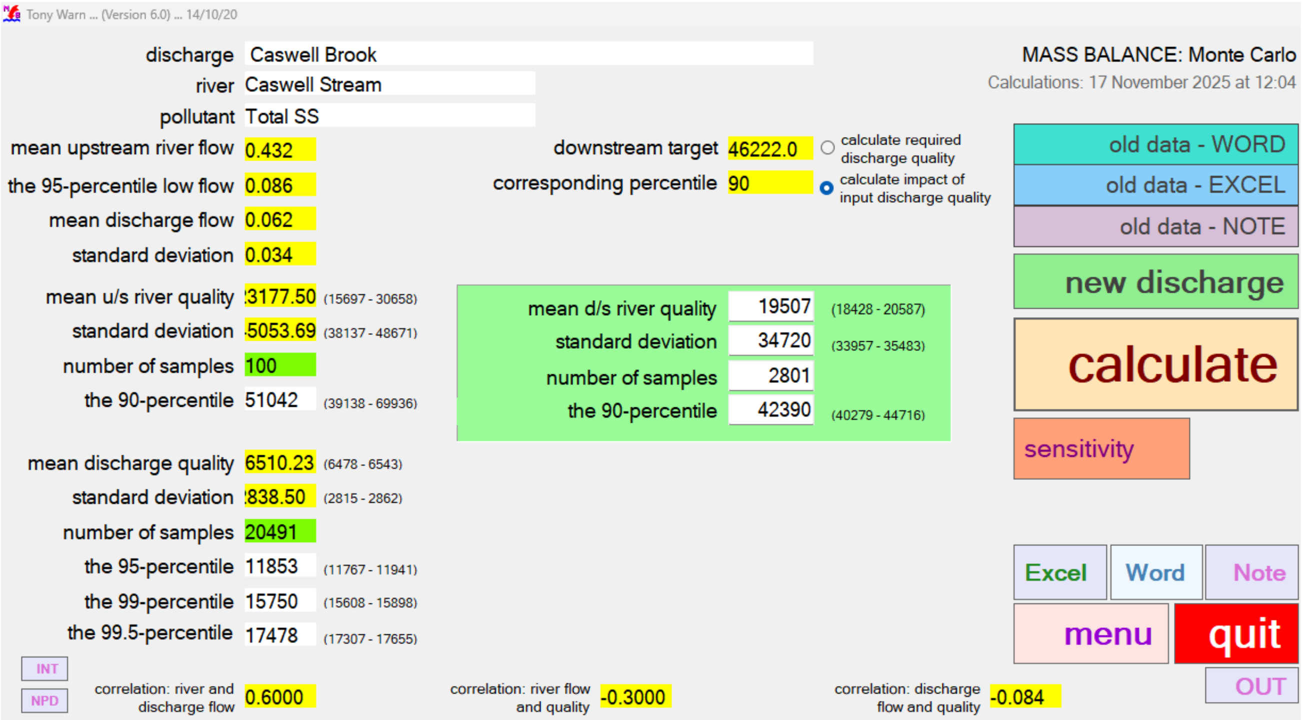

Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Caswell Stream
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 10:46
mean upstream river flow 0.432
the 95-percentile low flow 0.086
mean discharge flow 0.062
standard deviation 0.034
downstream target 6
corresponding percentile 5
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 5-percentile 7.74 (7.70 - 7.78)
mean d/s river quality 7.93 (7.93 - 7.94)
standard deviation 0.20 (0.20 - 0.21)
number of samples 3191
the 5-percentile 7.61 (7.60 - 7.62)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000


Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Caswell Stream
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 19 November 2025 at 09:57
mean upstream river flow 0.432
the 95-percentile low flow 0.086
mean discharge flow 0.062
standard deviation 0.034
downstream target 5.2
corresponding percentile 10
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 10-percentile 7.82 (7.78 - 7.85)
mean d/s river quality 7.93 (7.93 - 7.94)
standard deviation 0.20 (0.20 - 0.21)
number of samples 3191
the 10-percentile 7.68 (7.67 - 7.68)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000


Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Caswell Stream
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 10:49
mean upstream river flow 0.432
the 95-percentile low flow 0.086
mean discharge flow 0.062
standard deviation 0.034
downstream target 9
corresponding percentile 95
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 95-percentile 8.49 (8.45 - 8.53)
mean d/s river quality 7.93 (7.93 - 7.94)
standard deviation 0.20 (0.20 - 0.21)
number of samples 3191
the 95-percentile 8.27 (8.26 - 8.28)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000

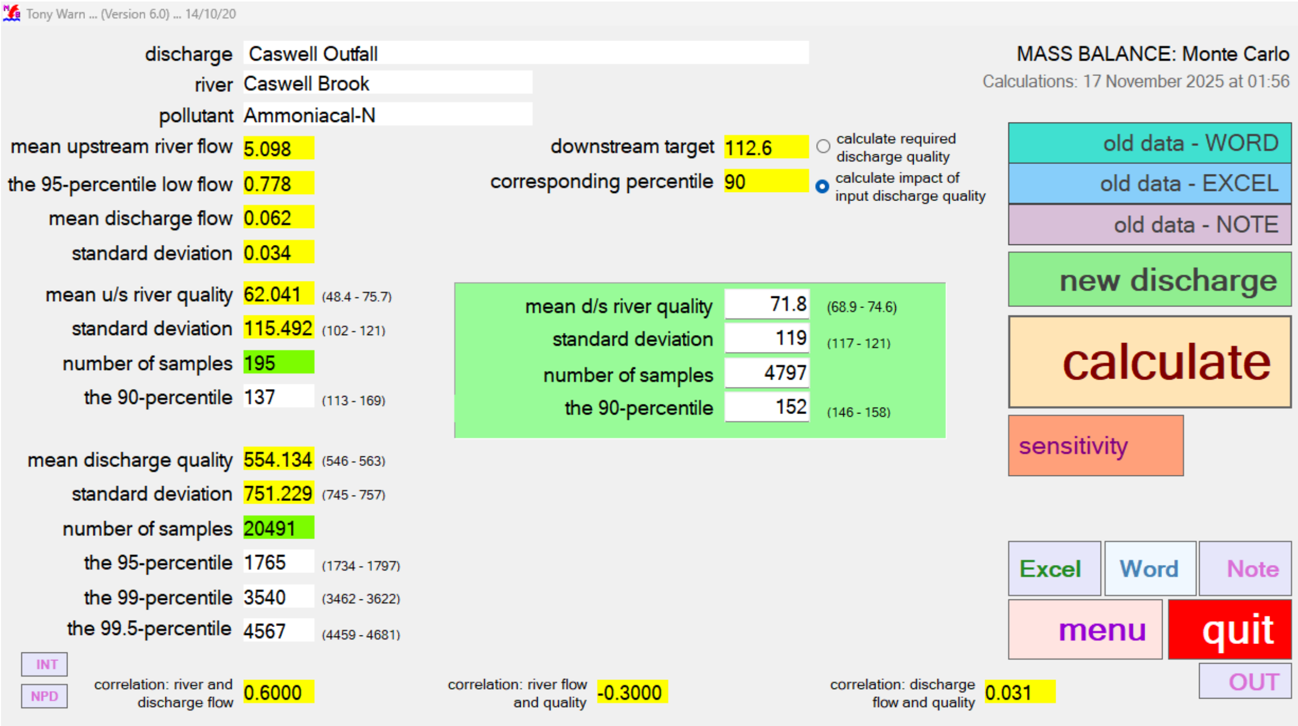


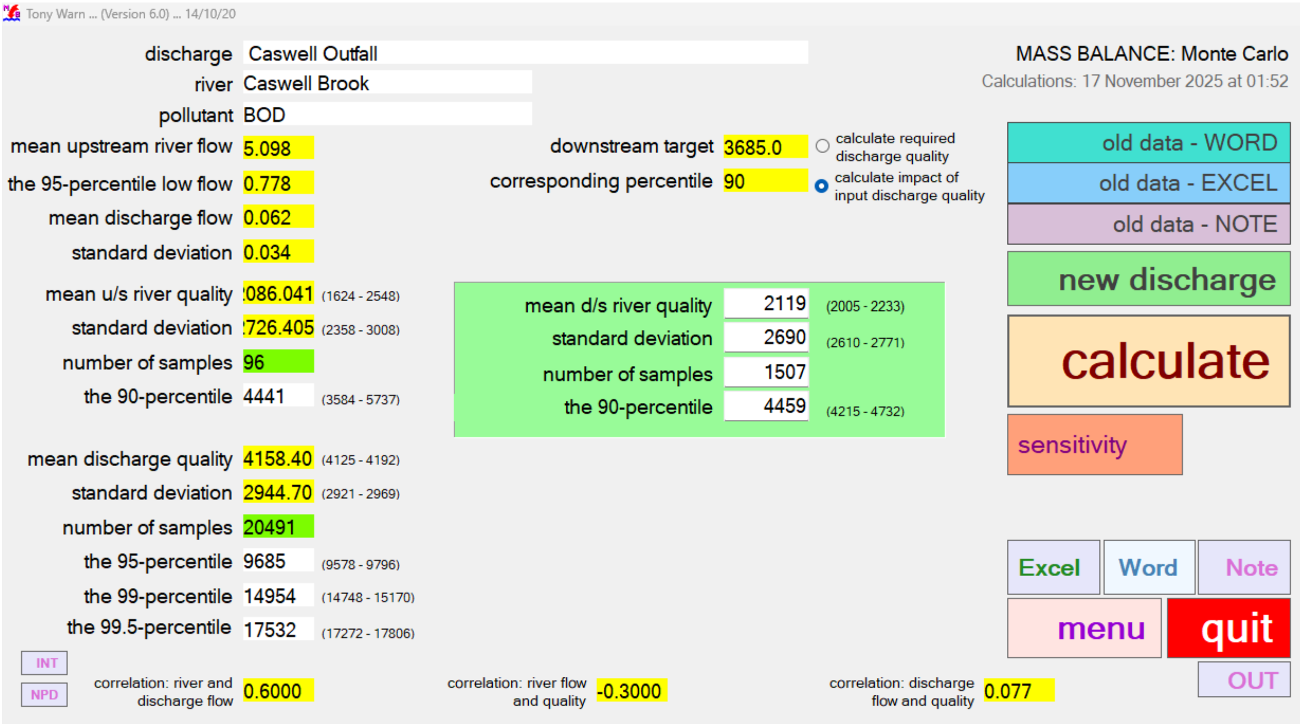
Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Brook
river Caswell Stream
pollutant Total Phosphorus
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 12:08
mean upstream river flow 0.432
the 95-percentile low flow 0.086
mean discharge flow 0.062
standard deviation 0.034
downstream target 225.5
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 123.19 (103 - 144)
standard deviation 99.86 (85.8 - 115)
number of samples 66
the 90-percentile 233 (195 - 292)
mean d/s river quality 537 (533 - 540)
standard deviation 257 (255 - 259)
number of samples 16468
the 90-percentile 876 (870 - 883)
mean discharge quality 2711.94 (2705 - 2718)
standard deviation 567.59 (563 - 572)
number of samples 20491
the 95-percentile 3731 (3718 - 3745)
the 99-percentile 4297 (4278 - 4317)
the 99.5-percentile 4525 (4503 - 4548)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.262

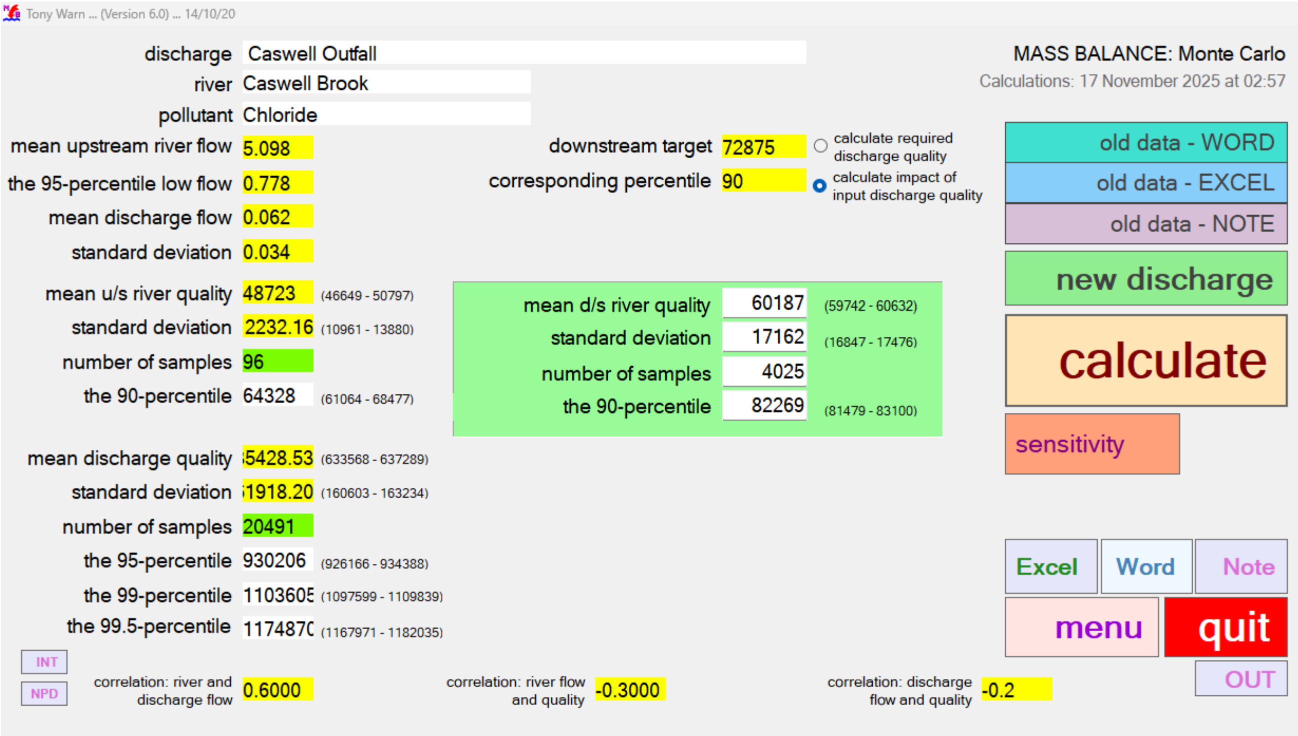


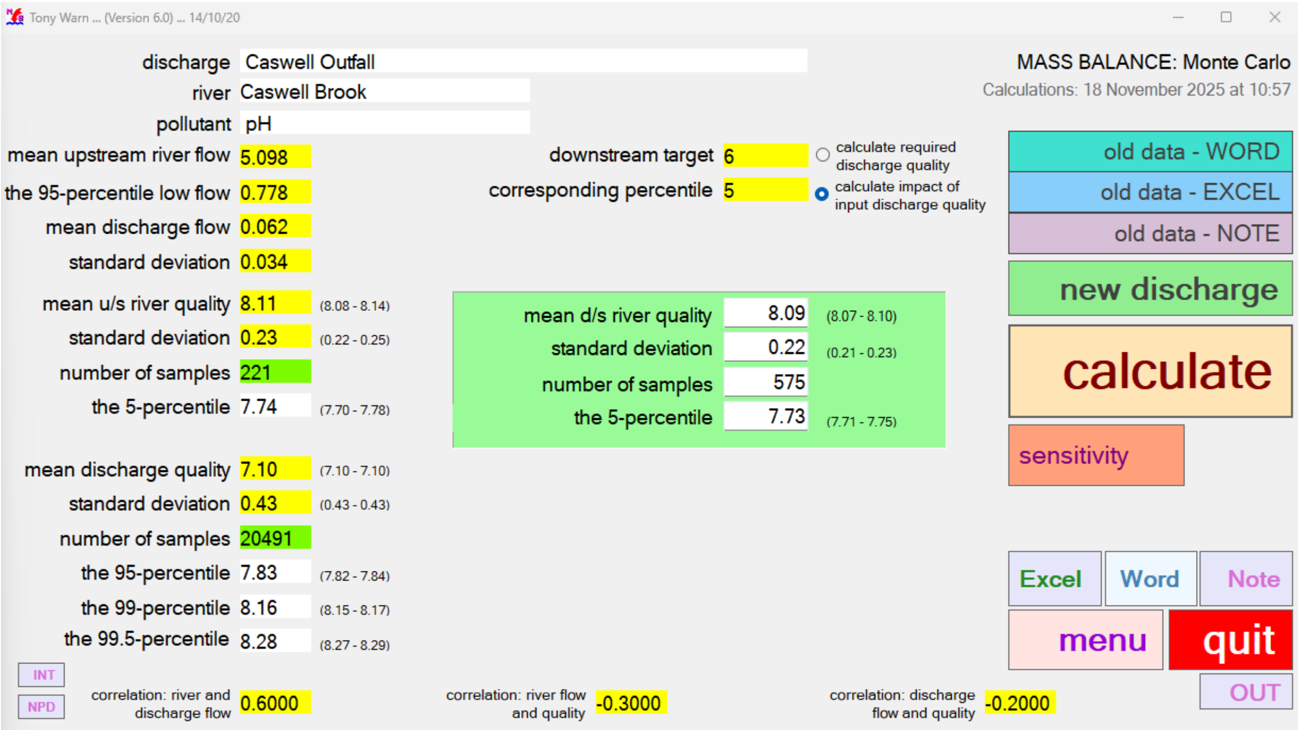
Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Brook
river Caswell Stream
pollutant Total SS
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 12:04
mean upstream river flow 0.432
the 95-percentile low flow 0.086
mean discharge flow 0.062
standard deviation 0.034
downstream target 46222.0
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 3177.50 (15697 - 30658)
standard deviation 5053.69 (38137 - 48671)
number of samples 100
the 90-percentile 51042 (39138 - 69936)
mean d/s river quality 19507 (18428 - 20587)
standard deviation 34720 (33957 - 35483)
number of samples 2801
the 90-percentile 42390 (40279 - 44716)
mean discharge quality 6510.23 (6478 - 6543)
standard deviation 838.50 (2815 - 2862)
number of samples 20491
the 95-percentile 11853 (11767 - 11941)
the 99-percentile 15750 (15608 - 15898)
the 99.5-percentile 17478 (17307 - 17655)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.084

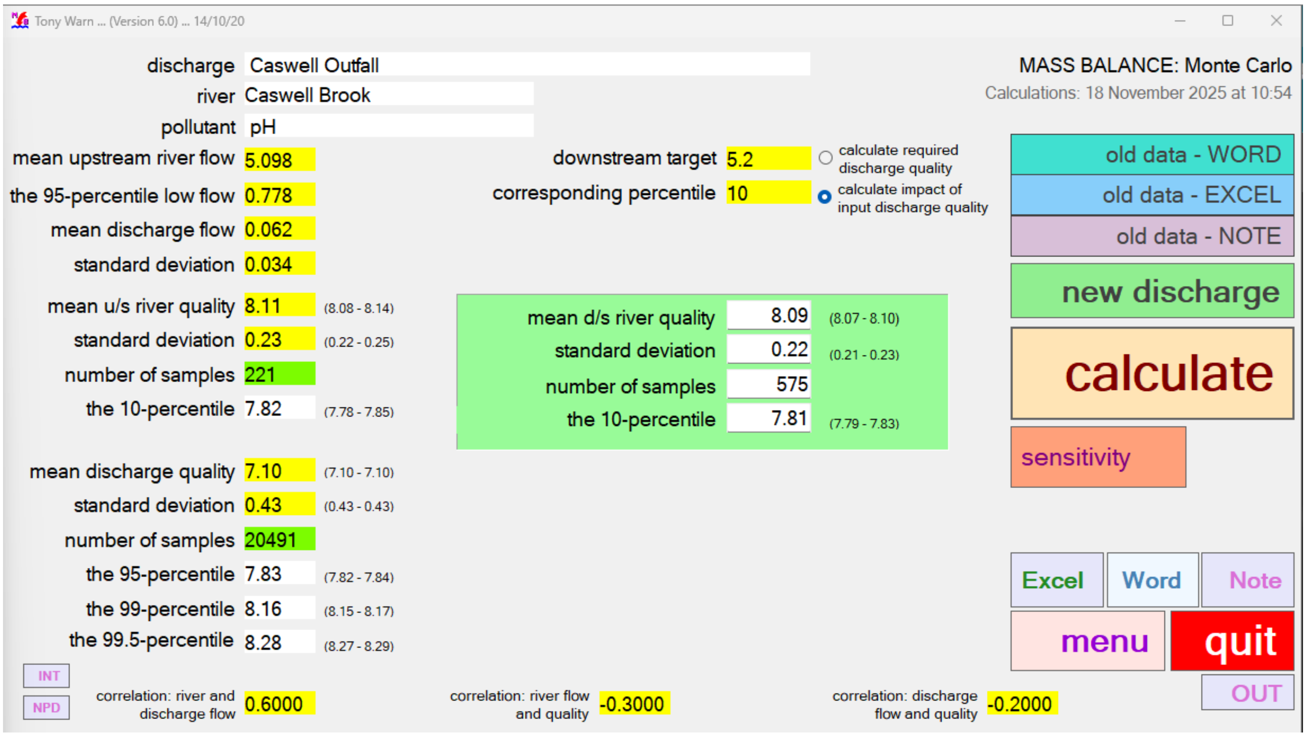
Caswell Brook

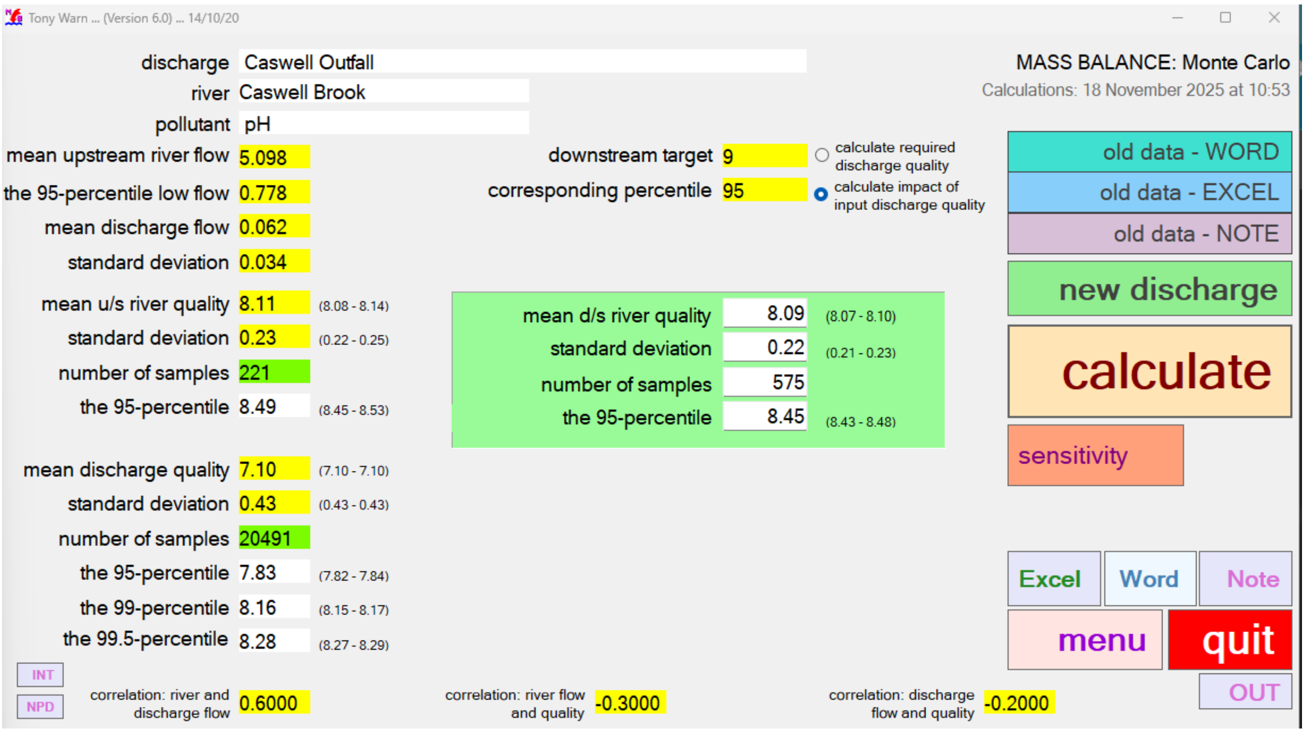


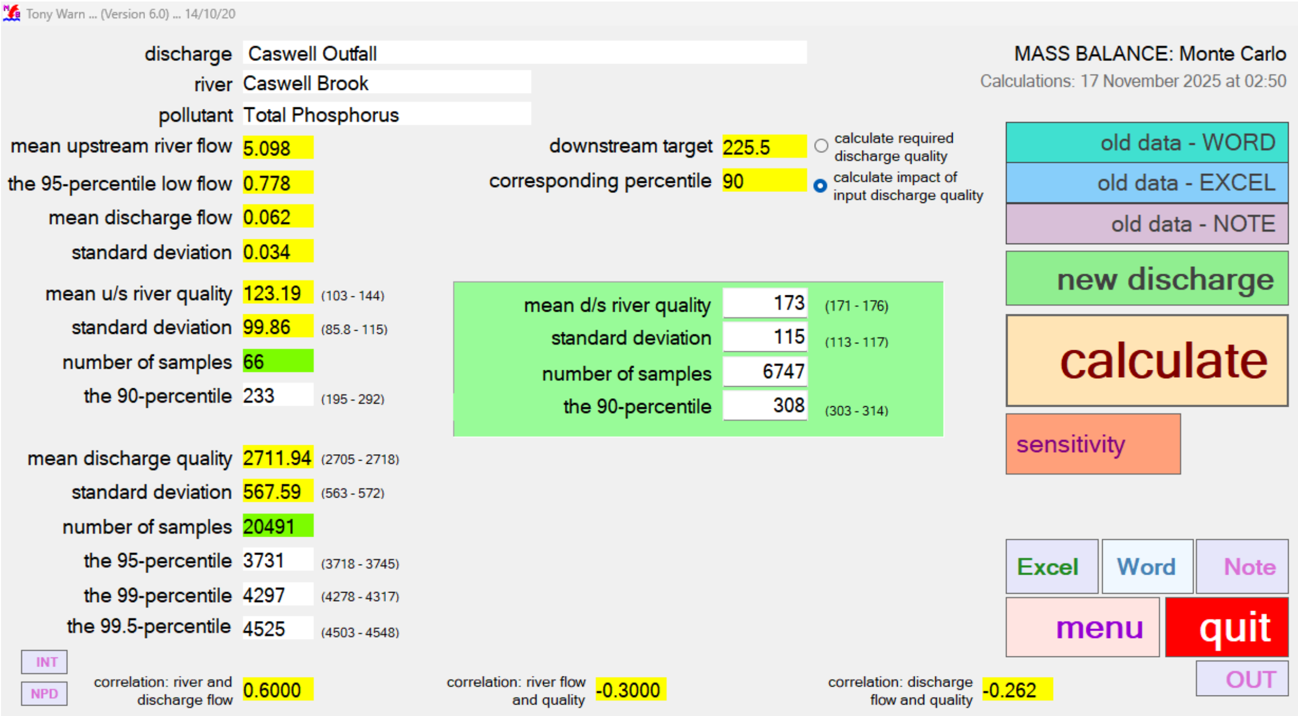


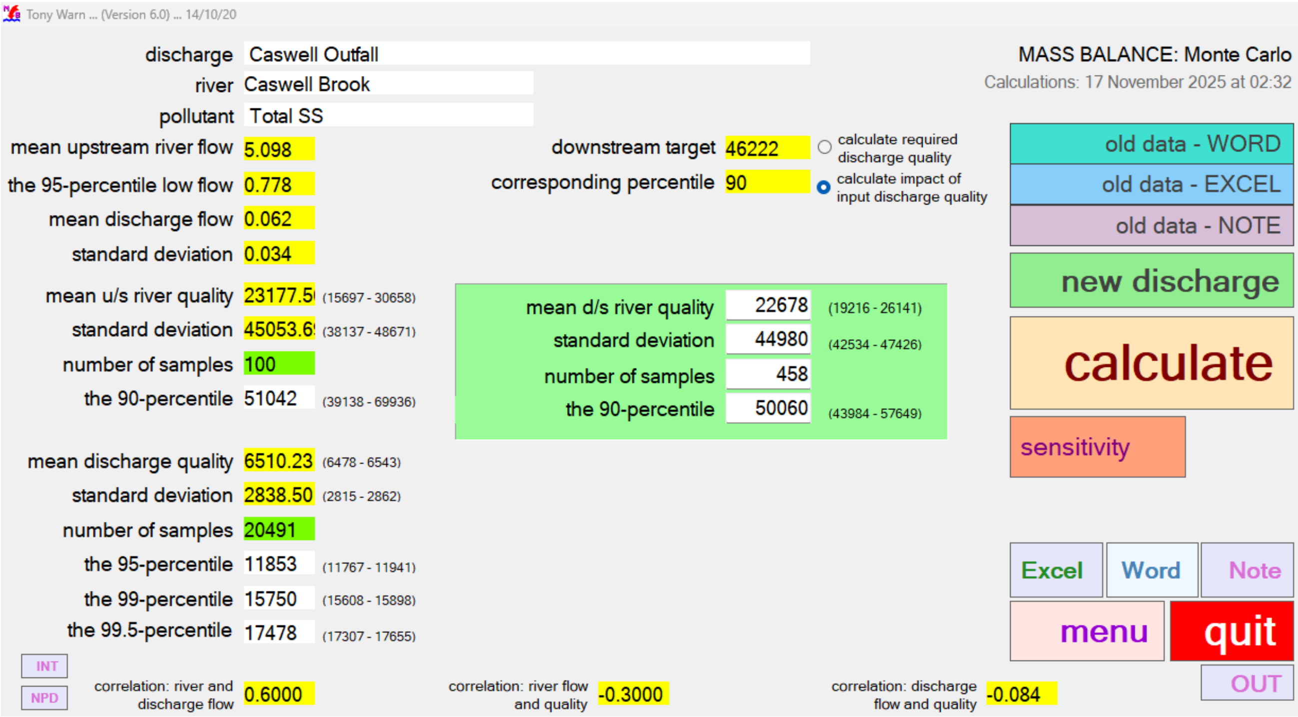

Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Caswell Brook
pollutant Chloride
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 02:57
mean upstream river flow 5.098
the 95-percentile low flow 0.778
mean discharge flow 0.062
standard deviation 0.034
downstream target 72875
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 48723 (46649 - 50797)
standard deviation 2232.16 (10961 - 13880)
number of samples 96
the 90-percentile 64328 (61064 - 68477)
mean d/s river quality 60187 (59742 - 60632)
standard deviation 17162 (16847 - 17476)
number of samples 4025
the 90-percentile 82269 (81479 - 83100)
mean discharge quality 5428.53 (633568 - 637289)
standard deviation 1918.20 (160603 - 163234)
number of samples 20491
the 95-percentile 930206 (926166 - 934388)
the 99-percentile 110360 (1097599 - 1109839)
the 99.5-percentile 117487 (1167971 - 1182035)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2


Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Caswell Brook
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 10:57
mean upstream river flow 5.098
the 95-percentile low flow 0.778
mean discharge flow 0.062
standard deviation 0.034
downstream target 6
corresponding percentile 5
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 5-percentile 7.74 (7.70 - 7.78)
mean d/s river quality 8.09 (8.07 - 8.10)
standard deviation 0.22 (0.21 - 0.23)
number of samples 575
the 5-percentile 7.73 (7.71 - 7.75)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000

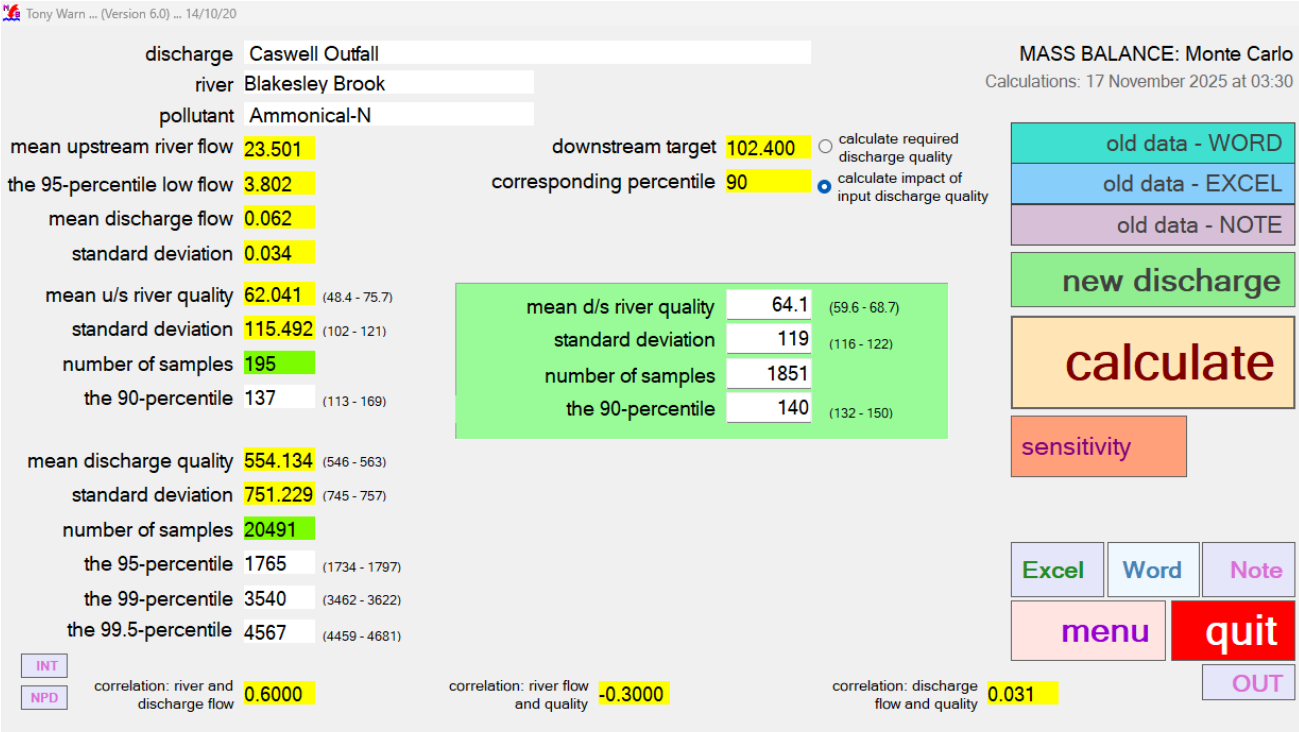

Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Caswell Brook
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 10:54
mean upstream river flow 5.098
the 95-percentile low flow 0.778
mean discharge flow 0.062
standard deviation 0.034
downstream target 5.2
corresponding percentile 10
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 10-percentile 7.82 (7.78 - 7.85)
mean d/s river quality 8.09 (8.07 - 8.10)
standard deviation 0.22 (0.21 - 0.23)
number of samples 575
the 10-percentile 7.81 (7.79 - 7.83)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000

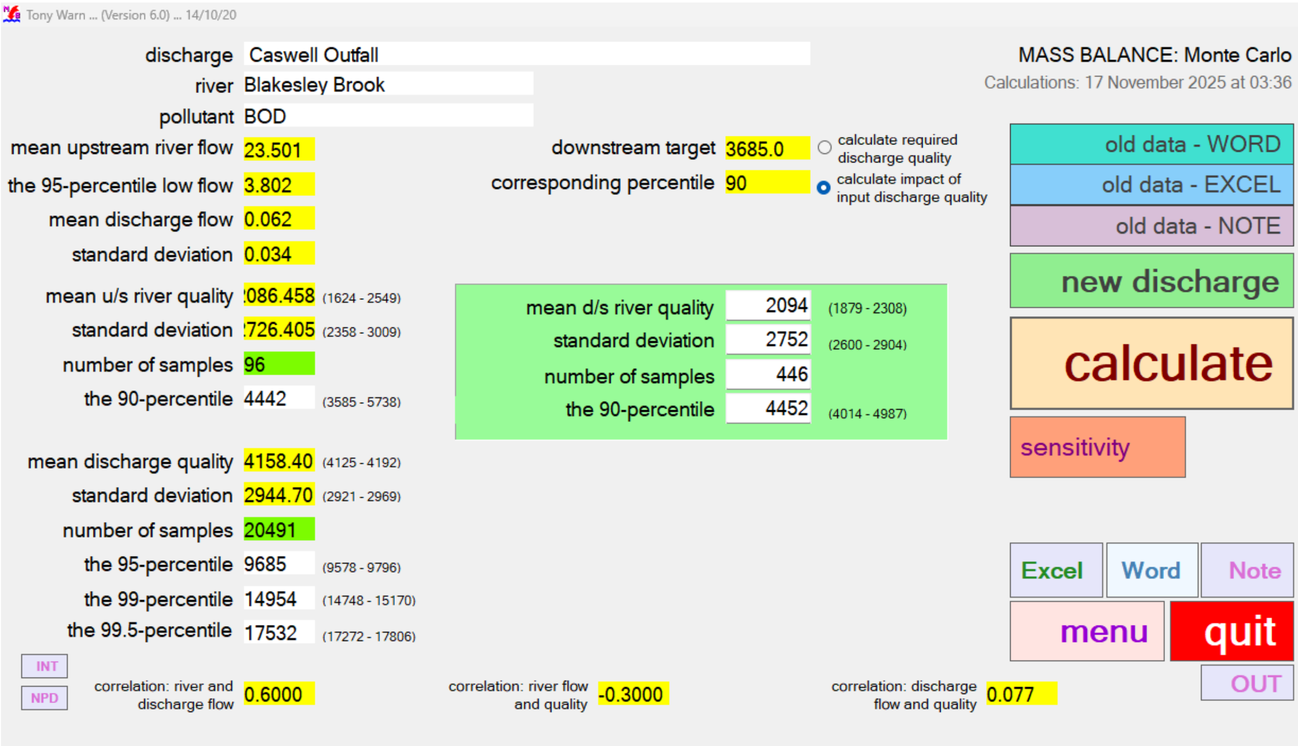

Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Caswell Brook
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 10:53
mean upstream river flow 5.098
the 95-percentile low flow 0.778
mean discharge flow 0.062
standard deviation 0.034
downstream target 9
corresponding percentile 95
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 95-percentile 8.49 (8.45 - 8.53)
mean d/s river quality 8.09 (8.07 - 8.10)
standard deviation 0.22 (0.21 - 0.23)
number of samples 575
the 95-percentile 8.45 (8.43 - 8.48)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000

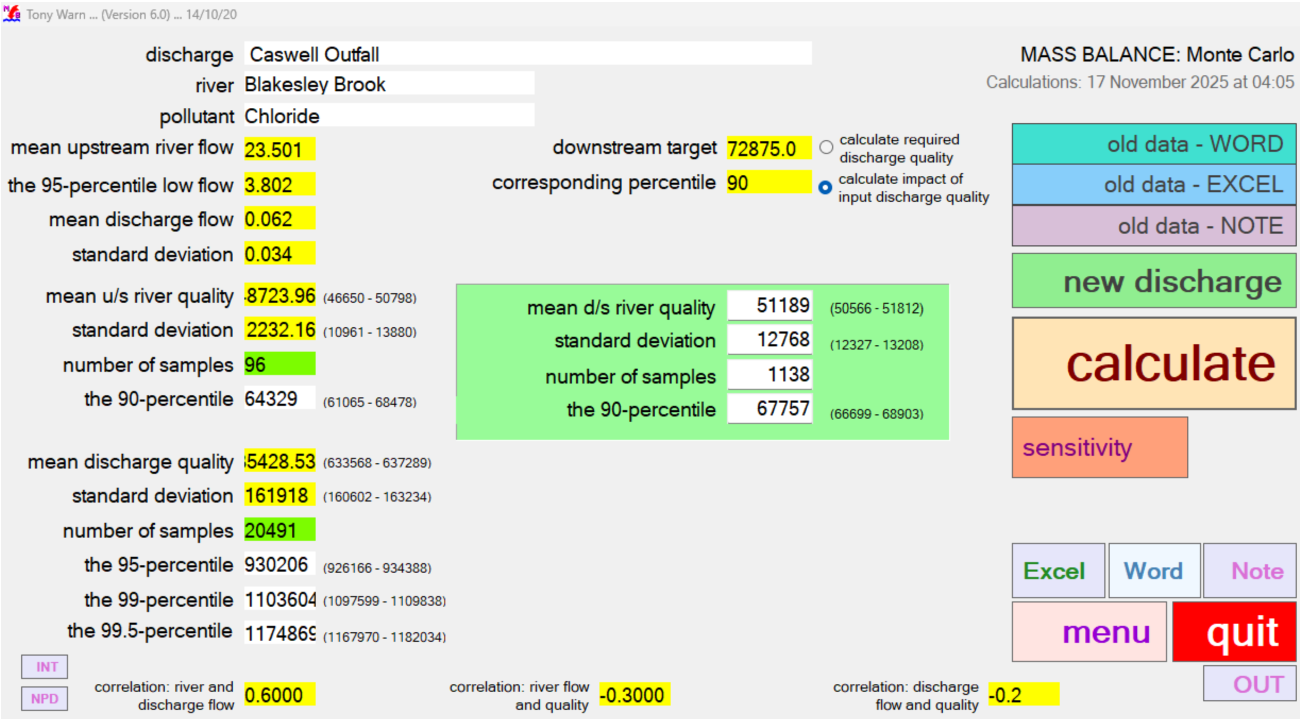

Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Caswell Brook
pollutant Total Phosphorus
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 02:50
mean upstream river flow 5.098
the 95-percentile low flow 0.778
mean discharge flow 0.062
standard deviation 0.034
downstream target 225.5
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
mean u/s river quality 123.19 (103 - 144)
standard deviation 99.86 (85.8 - 115)
number of samples 66
the 90-percentile 233 (195 - 292)
mean d/s river quality 173 (171 - 176)
standard deviation 115 (113 - 117)
number of samples 6747
the 90-percentile 308 (303 - 314)
calculate
sensitivity
mean discharge quality 2711.94 (2705 - 2718)
standard deviation 567.59 (563 - 572)
number of samples 20491
the 95-percentile 3731 (3718 - 3745)
the 99-percentile 4297 (4278 - 4317)
the 99.5-percentile 4525 (4503 - 4548)
Excel
Word
Note
menu
quit
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.262
OUT

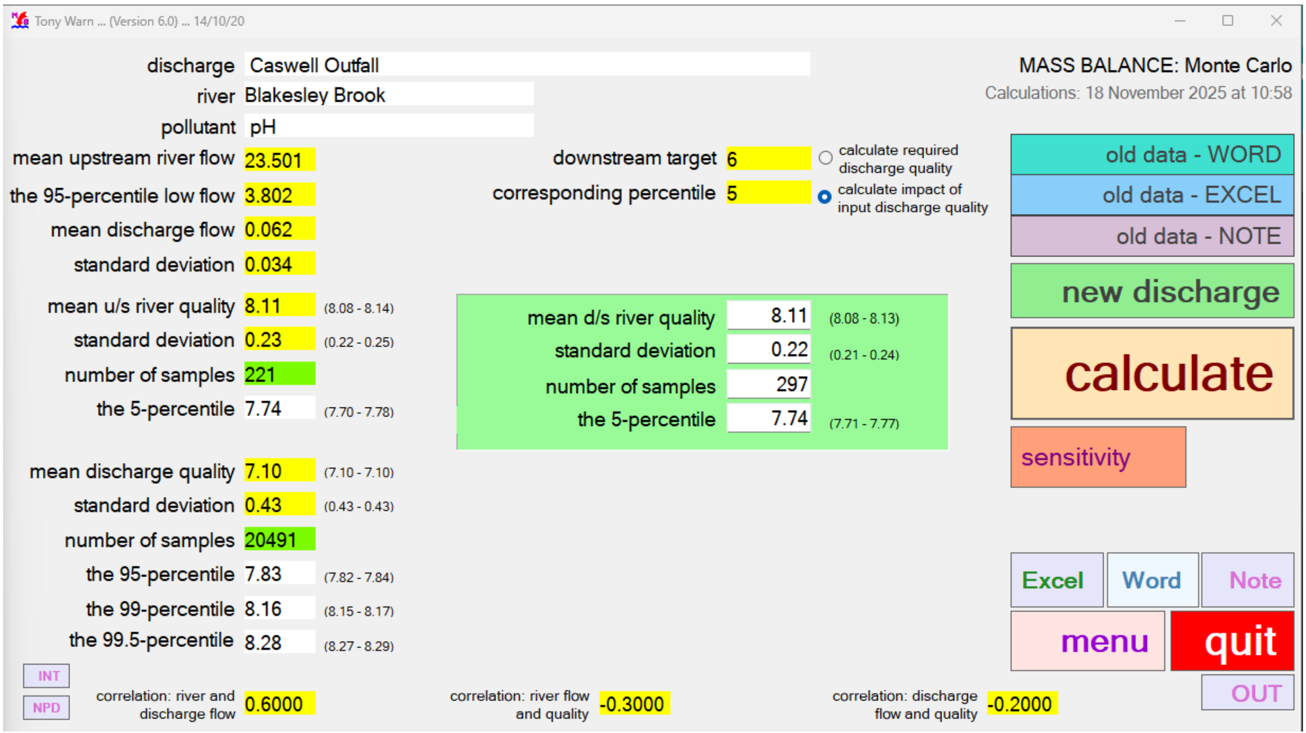

Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Caswell Brook
pollutant Total SS
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 02:32
mean upstream river flow 5.098
the 95-percentile low flow 0.778
mean discharge flow 0.062
standard deviation 0.034
downstream target 46222
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
mean u/s river quality 23177.5 (15697 - 30658)
standard deviation 45053.6 (38137 - 48671)
number of samples 100
the 90-percentile 51042 (39138 - 69936)
mean d/s river quality 22678 (19216 - 26141)
standard deviation 44980 (42534 - 47426)
number of samples 458
the 90-percentile 50060 (43984 - 57649)
calculate
sensitivity
mean discharge quality 6510.23 (6478 - 6543)
standard deviation 2838.50 (2815 - 2862)
number of samples 20491
the 95-percentile 11853 (11767 - 11941)
the 99-percentile 15750 (15608 - 15898)
the 99.5-percentile 17478 (17307 - 17655)
Excel
Word
Note
menu
quit
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.084
OUT

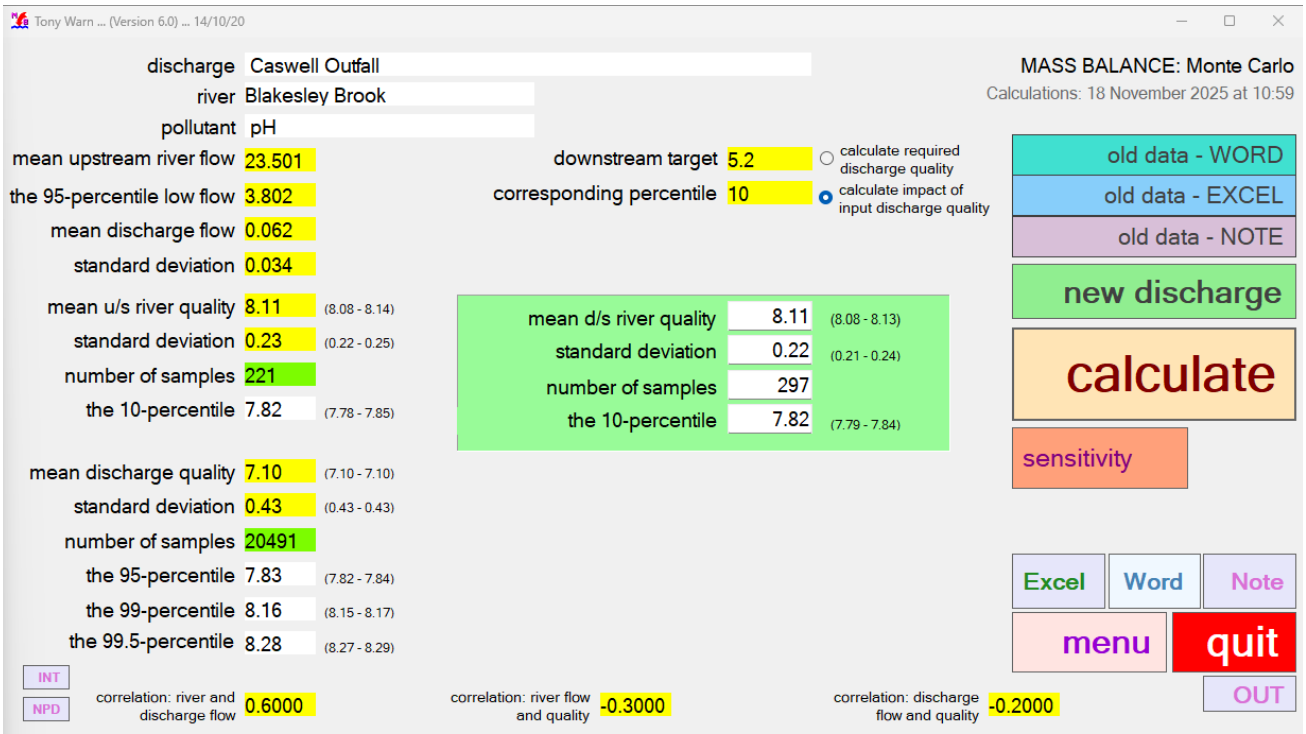
Blakesly Brook

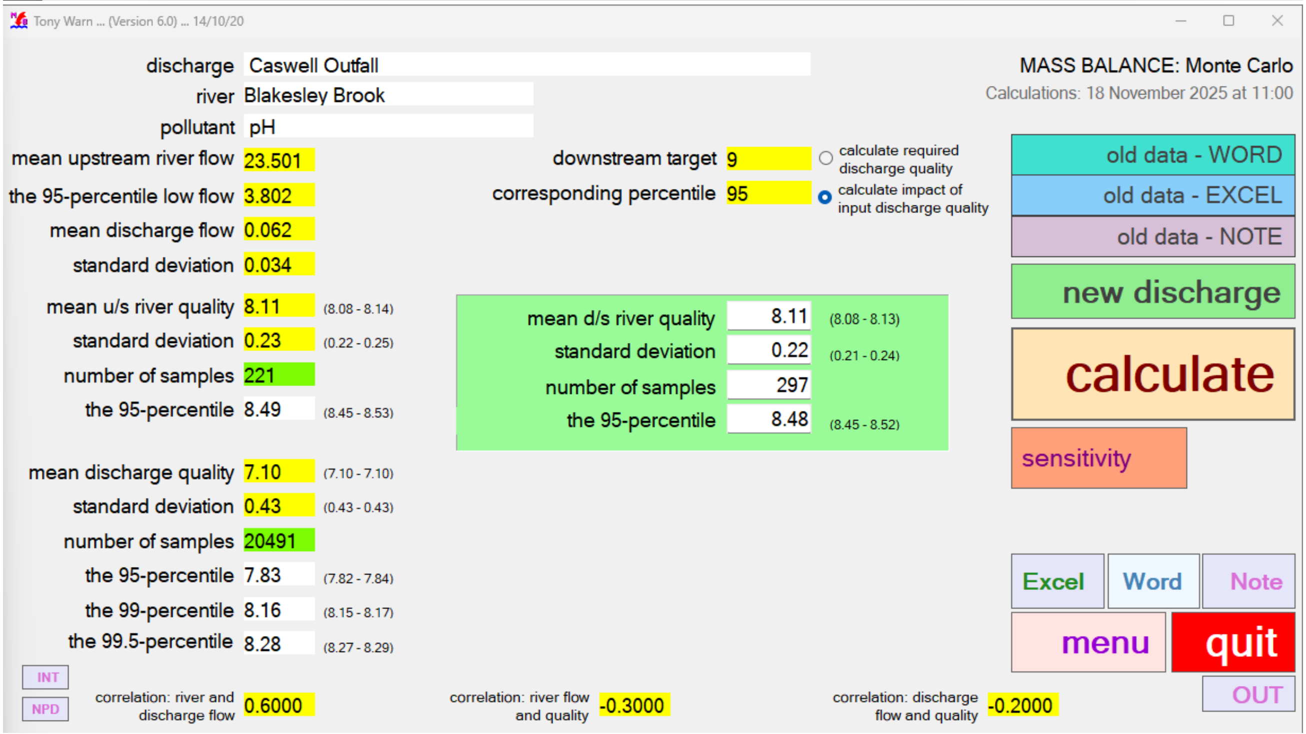


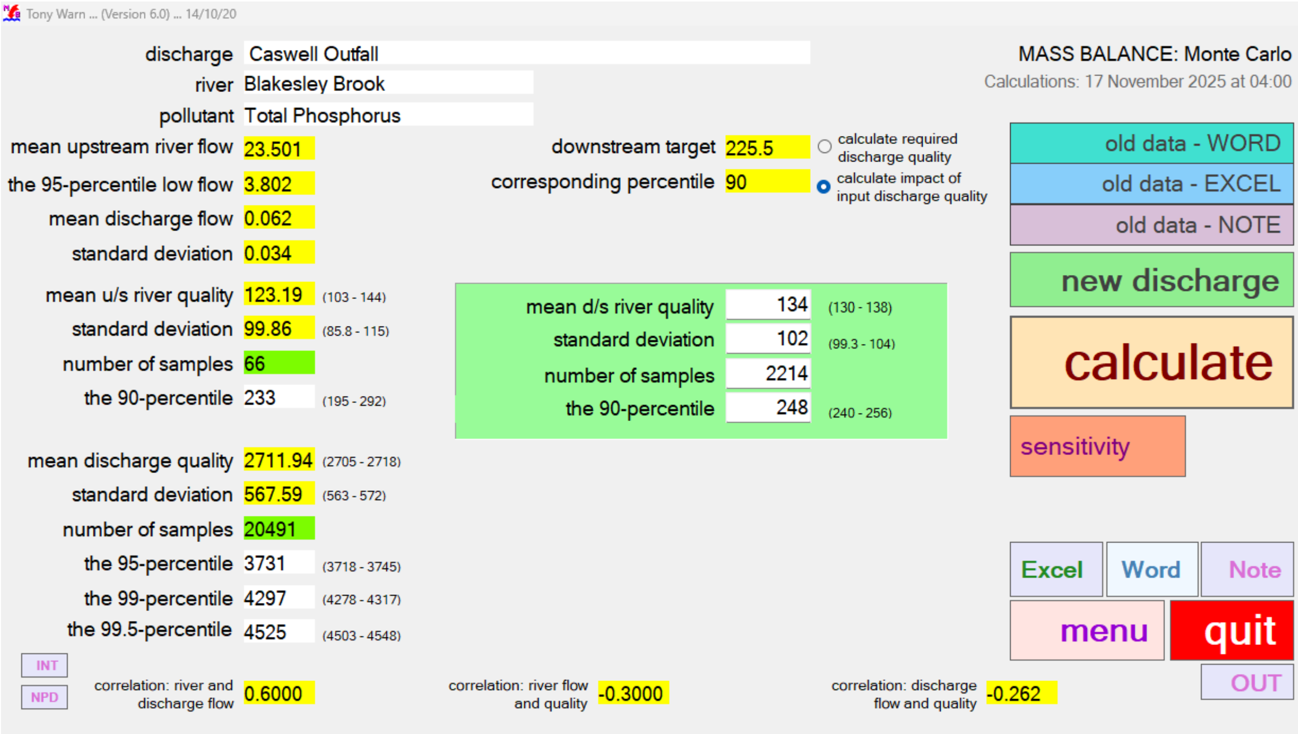


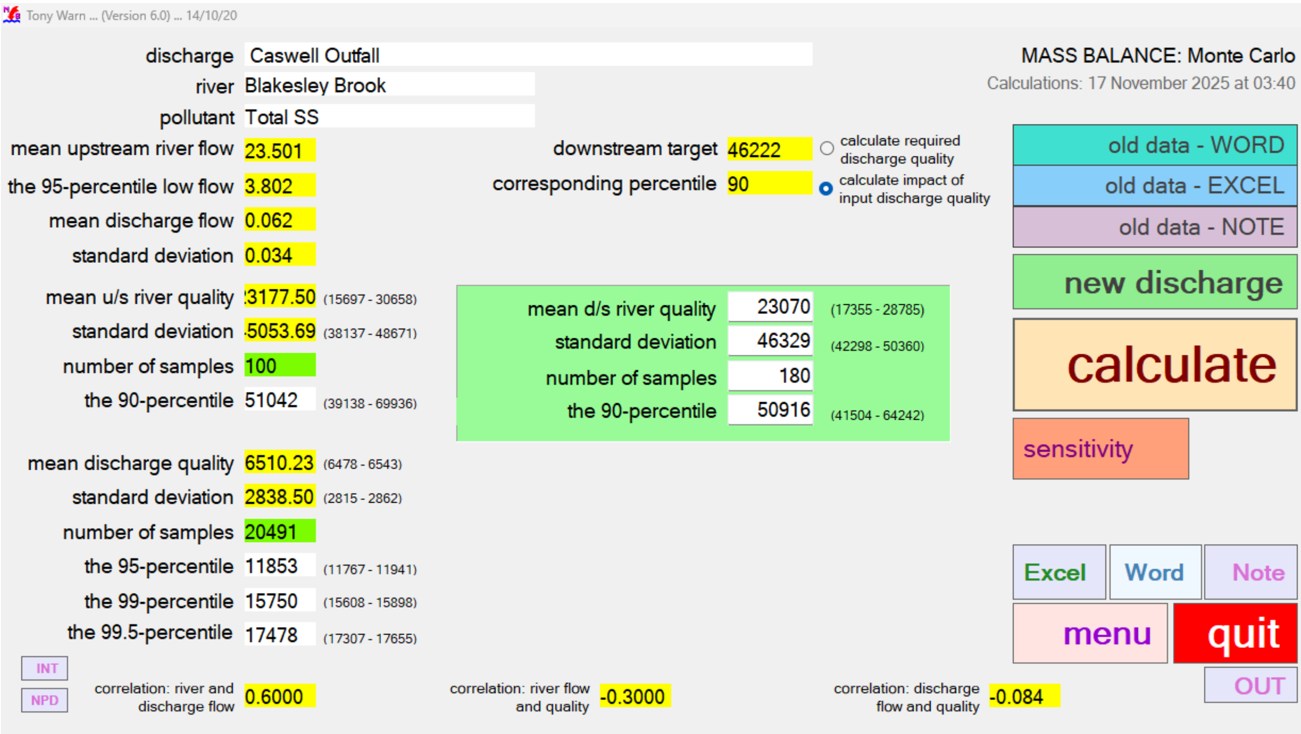

Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Blakesley Brook
pollutant Chloride
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 04:05
mean upstream river flow 23.501
the 95-percentile low flow 3.802
mean discharge flow 0.062
standard deviation 0.034
downstream target 72875.0
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8723.96 (46650 - 50798)
standard deviation 2232.16 (10961 - 13880)
number of samples 96
the 90-percentile 64329 (61065 - 68478)
mean d/s river quality 51189 (50566 - 51812)
standard deviation 12768 (12327 - 13208)
number of samples 1138
the 90-percentile 67757 (66699 - 68903)
mean discharge quality 5428.53 (633568 - 637289)
standard deviation 161918 (160602 - 163234)
number of samples 20491
the 95-percentile 930206 (926166 - 934388)
the 99-percentile 1103604 (1097599 - 1109838)
the 99.5-percentile 117486 (1167970 - 1182034)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2


Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Blakesley Brook
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 10:58
mean upstream river flow 23.501
the 95-percentile low flow 3.802
mean discharge flow 0.062
standard deviation 0.034
downstream target 6
corresponding percentile 5
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 5-percentile 7.74 (7.70 - 7.78)
mean d/s river quality 8.11 (8.08 - 8.13)
standard deviation 0.22 (0.21 - 0.24)
number of samples 297
the 5-percentile 7.74 (7.71 - 7.77)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000


Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Blakesley Brook
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 10:59
mean upstream river flow 23.501
the 95-percentile low flow 3.802
mean discharge flow 0.062
standard deviation 0.034
downstream target 5.2
corresponding percentile 10
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 10-percentile 7.82 (7.78 - 7.85)
mean d/s river quality 8.11 (8.08 - 8.13)
standard deviation 0.22 (0.21 - 0.24)
number of samples 297
the 10-percentile 7.82 (7.79 - 7.84)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000

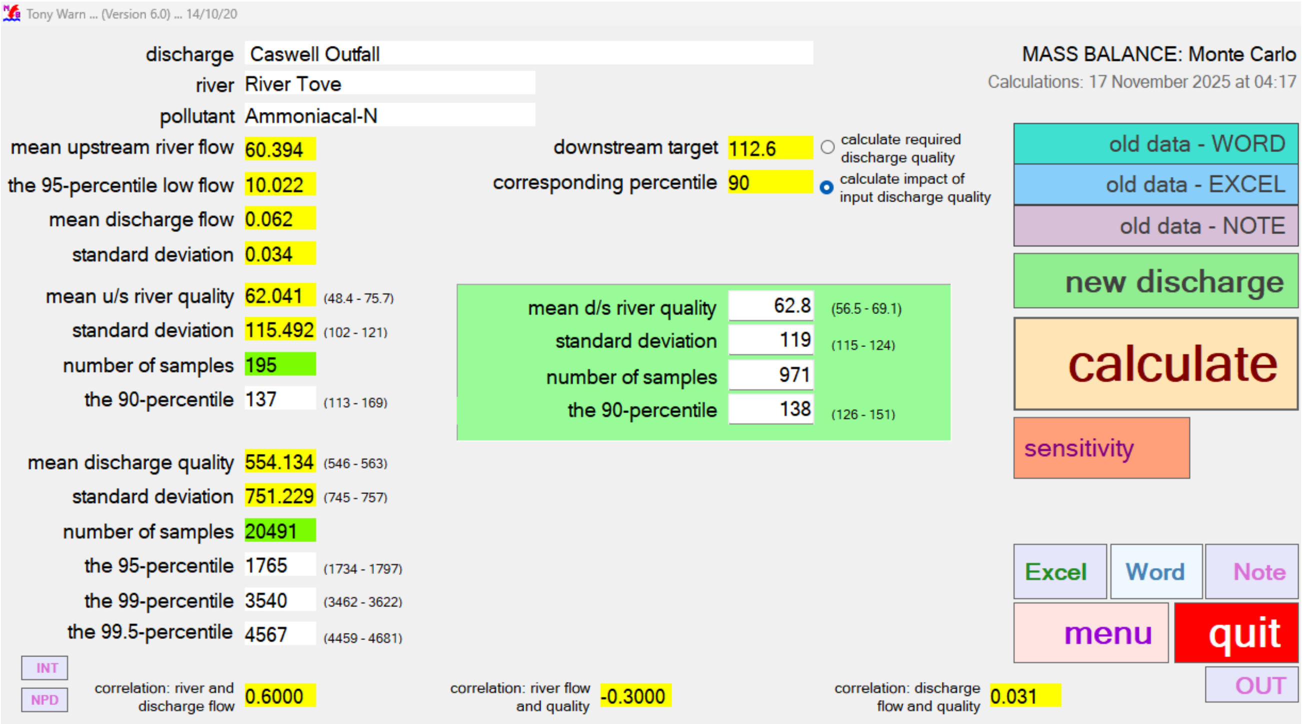

Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river Blakesley Brook
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 11:00
mean upstream river flow 23.501
the 95-percentile low flow 3.802
mean discharge flow 0.062
standard deviation 0.034
downstream target 9
corresponding percentile 95
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 95-percentile 8.49 (8.45 - 8.53)
mean d/s river quality 8.11 (8.08 - 8.13)
standard deviation 0.22 (0.21 - 0.24)
number of samples 297
the 95-percentile 8.48 (8.45 - 8.52)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000

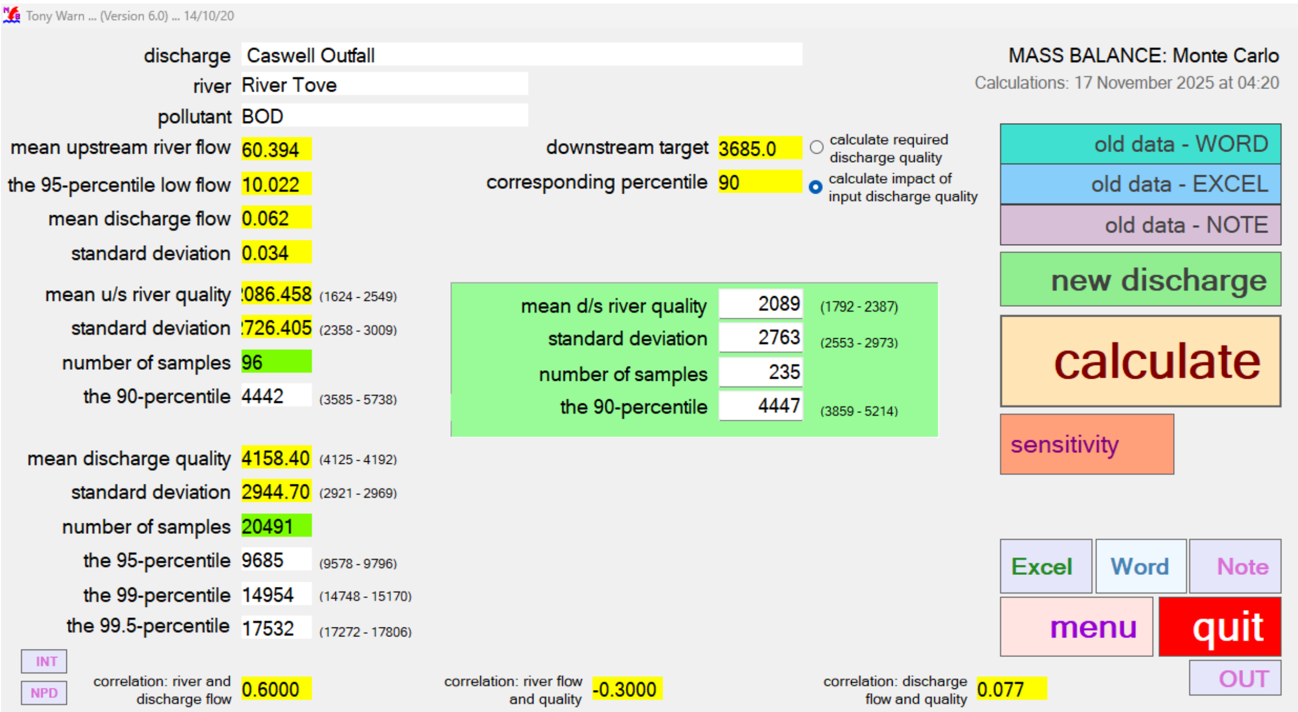

Tony Warn ... (Version 6.0) ... 14/10/20
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 04:00
discharge Caswell Outfall
river Blakesley Brook
pollutant Total Phosphorus
mean upstream river flow 23.501
the 95-percentile low flow 3.802
mean discharge flow 0.062
standard deviation 0.034
mean u/s river quality 123.19 (103 - 144)
standard deviation 99.86 (85.8 - 115)
number of samples 66
the 90-percentile 233 (195 - 292)
mean discharge quality 2711.94 (2705 - 2718)
standard deviation 567.59 (563 - 572)
number of samples 20491
the 95-percentile 3731 (3718 - 3745)
the 99-percentile 4297 (4278 - 4317)
the 99.5-percentile 4525 (4503 - 4548)
downstream target 225.5
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
mean d/s river quality 134 (130 - 138)
standard deviation 102 (99.3 - 104)
number of samples 2214
the 90-percentile 248 (240 - 256)
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.262

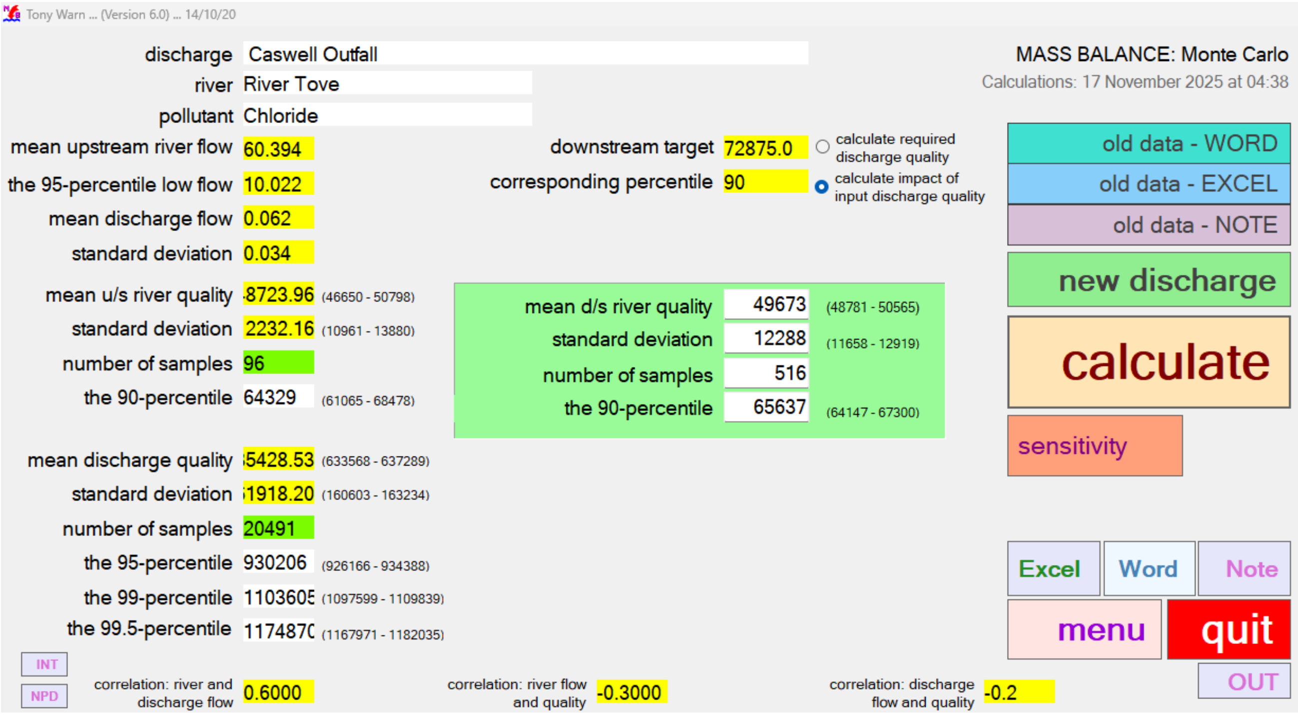

Tony Warn ... (Version 6.0) ... 14/10/20
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 03:40
discharge Caswell Outfall
river Blakesley Brook
pollutant Total SS
mean upstream river flow 23.501
the 95-percentile low flow 3.802
mean discharge flow 0.062
standard deviation 0.034
mean u/s river quality 3177.50 (15697 - 30658)
standard deviation 5053.69 (38137 - 48671)
number of samples 100
the 90-percentile 51042 (39138 - 69936)
mean discharge quality 6510.23 (6478 - 6543)
standard deviation 2838.50 (2815 - 2862)
number of samples 20491
the 95-percentile 11853 (11767 - 11941)
the 99-percentile 15750 (15608 - 15898)
the 99.5-percentile 17478 (17307 - 17655)
downstream target 46222
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
mean d/s river quality 23070 (17355 - 28785)
standard deviation 46329 (42298 - 50360)
number of samples 180
the 90-percentile 50916 (41504 - 64242)
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.084

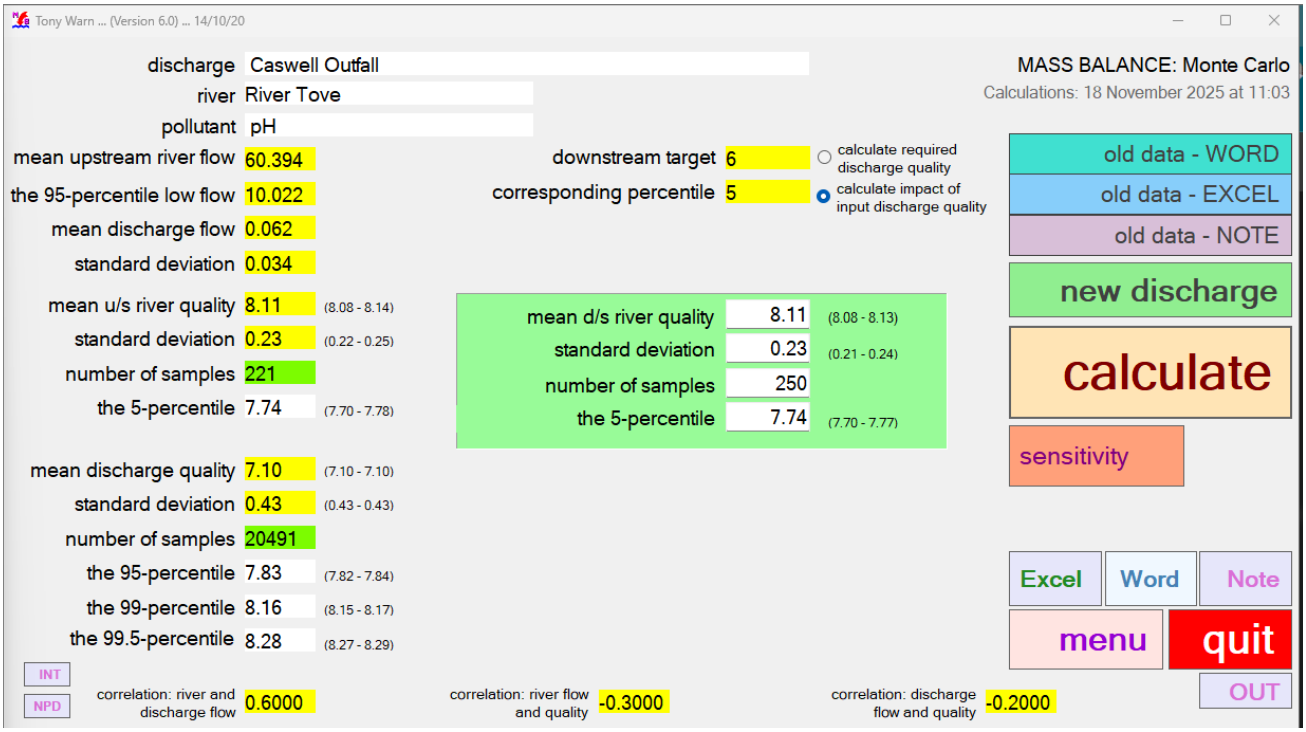
REPORT

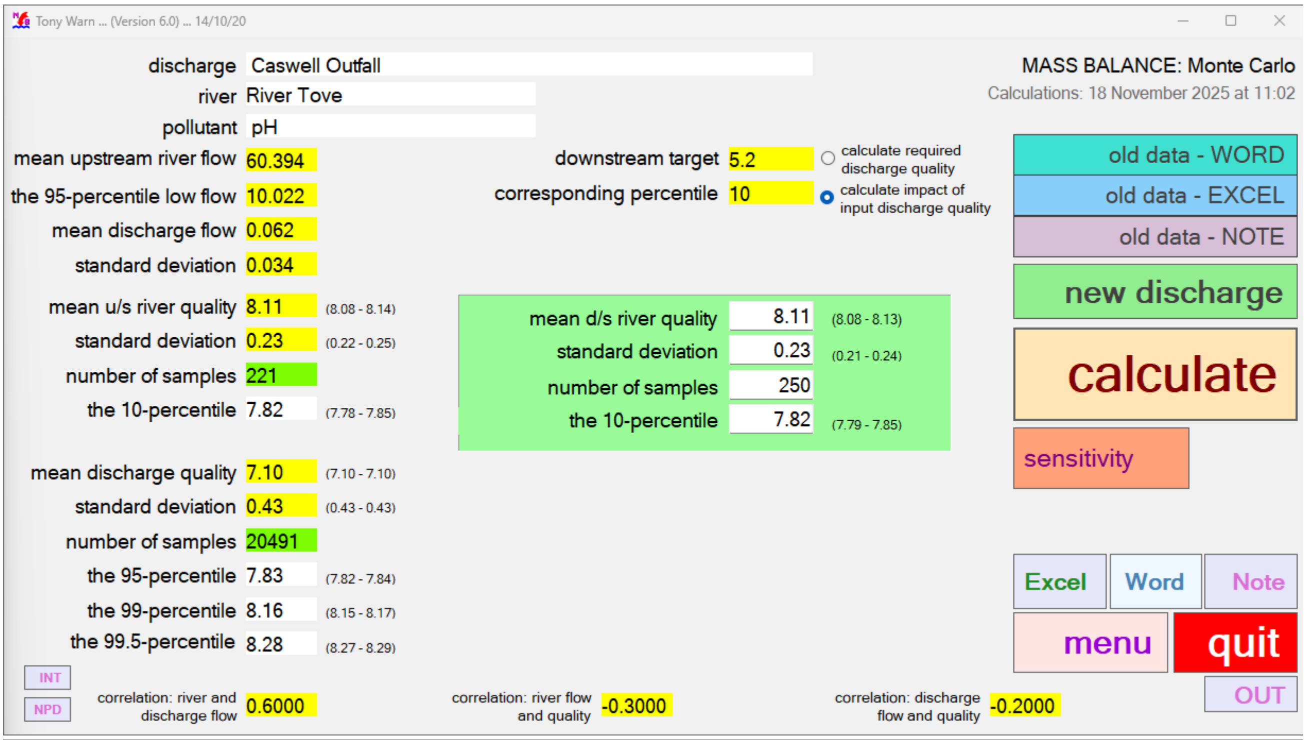
River Tove

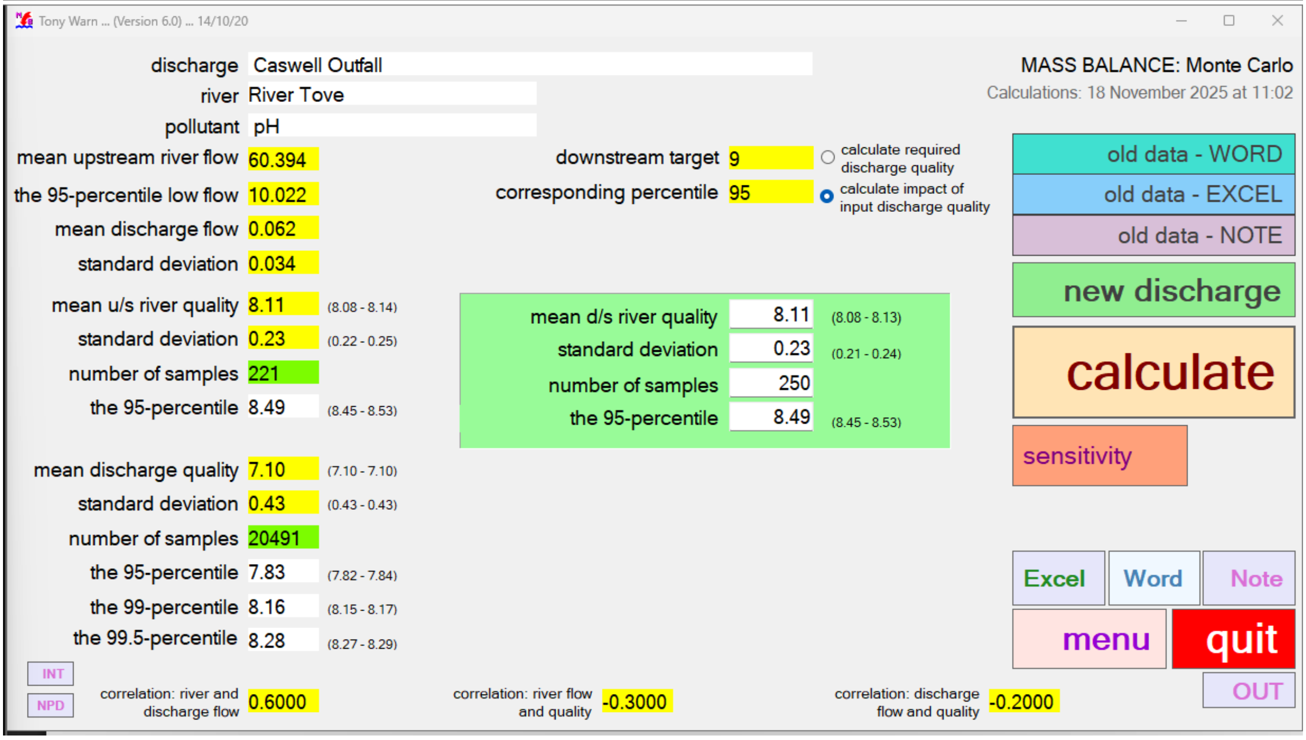


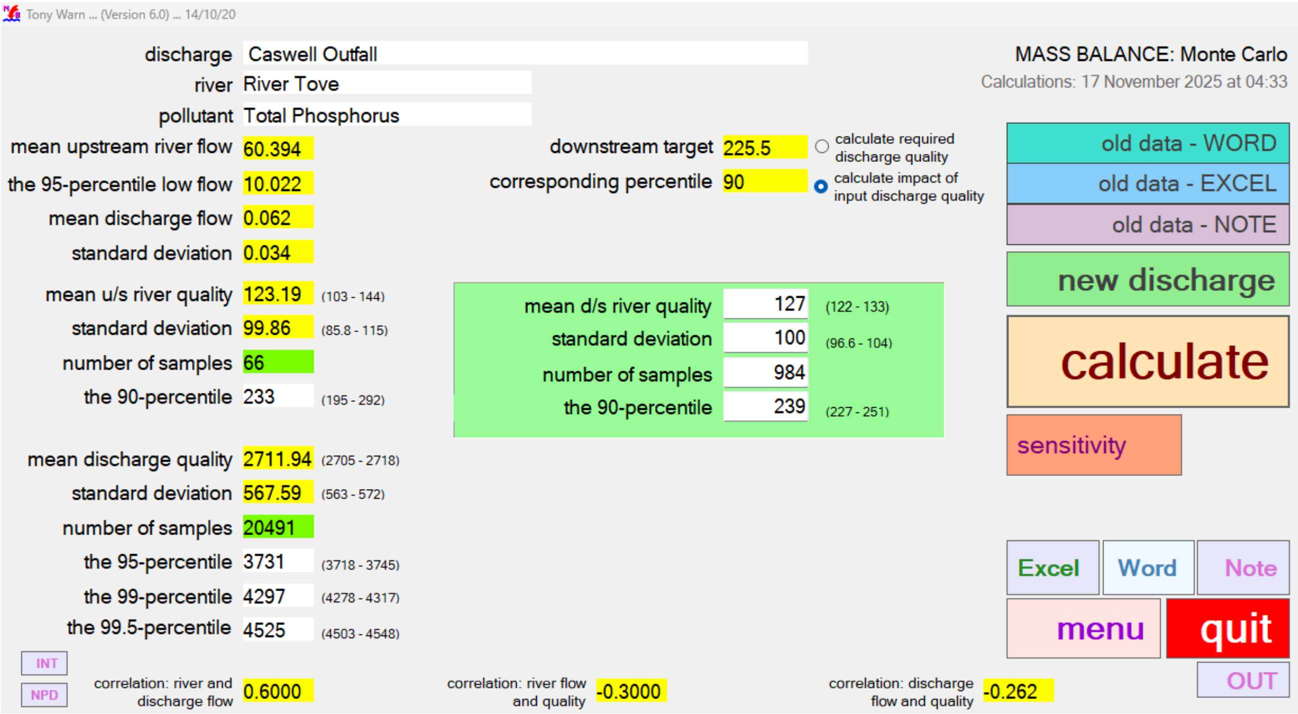


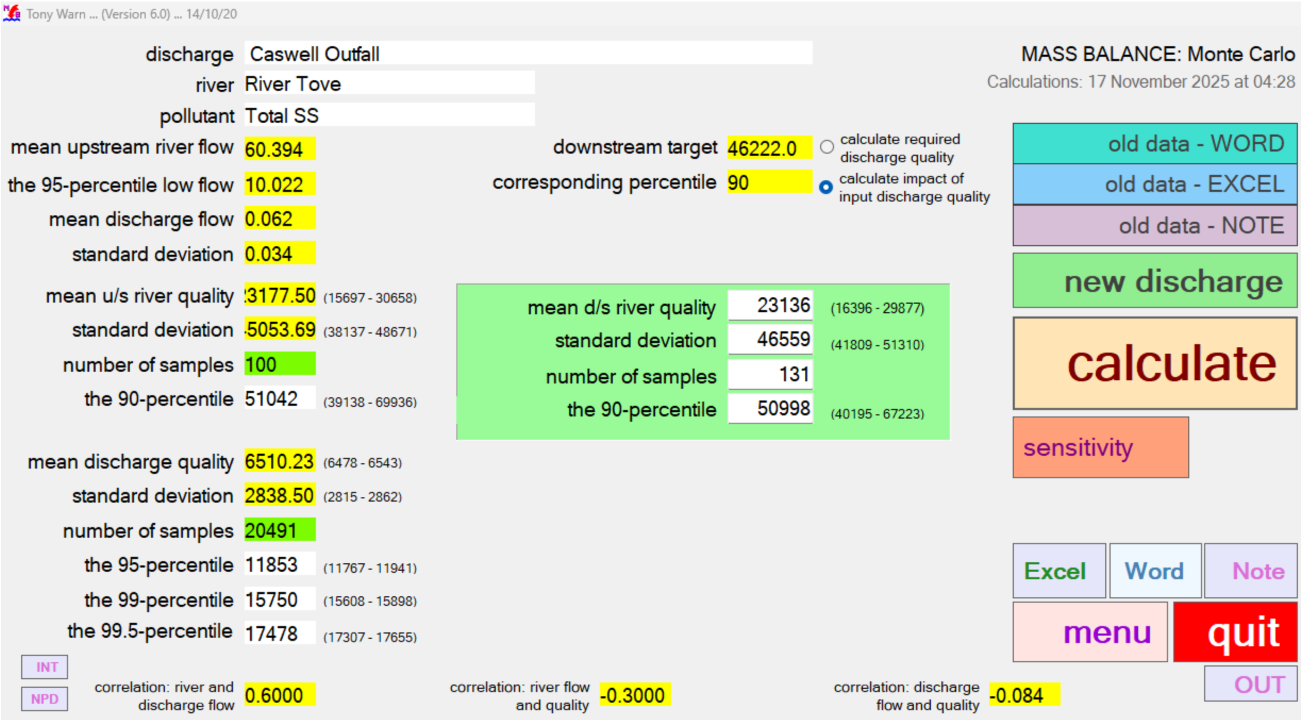

Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river River Tove
pollutant Chloride
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 04:38
mean upstream river flow 60.394
the 95-percentile low flow 10.022
mean discharge flow 0.062
standard deviation 0.034
downstream target 72875.0
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8723.96 (46650 - 50798)
standard deviation 2232.16 (10961 - 13880)
number of samples 96
the 90-percentile 64329 (61065 - 68478)
mean d/s river quality 49673 (48781 - 50565)
standard deviation 12288 (11658 - 12919)
number of samples 516
the 90-percentile 65637 (64147 - 67300)
mean discharge quality 5428.53 (633568 - 637289)
standard deviation 1918.20 (160603 - 163234)
number of samples 20491
the 95-percentile 930206 (926166 - 934388)
the 99-percentile 110360 (1097599 - 1109839)
the 99.5-percentile 117487 (1167971 - 1182035)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2


Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river River Tove
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 11:03
mean upstream river flow 60.394
the 95-percentile low flow 10.022
mean discharge flow 0.062
standard deviation 0.034
downstream target 6
corresponding percentile 5
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 5-percentile 7.74 (7.70 - 7.78)
mean d/s river quality 8.11 (8.08 - 8.13)
standard deviation 0.23 (0.21 - 0.24)
number of samples 250
the 5-percentile 7.74 (7.70 - 7.77)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000


Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river River Tove
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 11:02
mean upstream river flow 60.394
the 95-percentile low flow 10.022
mean discharge flow 0.062
standard deviation 0.034
downstream target 5.2
corresponding percentile 10
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 10-percentile 7.82 (7.78 - 7.85)
mean d/s river quality 8.11 (8.08 - 8.13)
standard deviation 0.23 (0.21 - 0.24)
number of samples 250
the 10-percentile 7.82 (7.79 - 7.85)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000


Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river River Tove
pollutant pH
MASS BALANCE: Monte Carlo
Calculations: 18 November 2025 at 11:02
mean upstream river flow 60.394
the 95-percentile low flow 10.022
mean discharge flow 0.062
standard deviation 0.034
downstream target 9
corresponding percentile 95
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
calculate
sensitivity
mean u/s river quality 8.11 (8.08 - 8.14)
standard deviation 0.23 (0.22 - 0.25)
number of samples 221
the 95-percentile 8.49 (8.45 - 8.53)
mean d/s river quality 8.11 (8.08 - 8.13)
standard deviation 0.23 (0.21 - 0.24)
number of samples 250
the 95-percentile 8.49 (8.45 - 8.53)
mean discharge quality 7.10 (7.10 - 7.10)
standard deviation 0.43 (0.43 - 0.43)
number of samples 20491
the 95-percentile 7.83 (7.82 - 7.84)
the 99-percentile 8.16 (8.15 - 8.17)
the 99.5-percentile 8.28 (8.27 - 8.29)
Excel
Word
Note
menu
quit
OUT
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.2000


Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river River Tove
pollutant Total Phosphorus
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 04:33
mean upstream river flow 60.394
the 95-percentile low flow 10.022
mean discharge flow 0.062
standard deviation 0.034
downstream target 225.5
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
mean u/s river quality 123.19 (103 - 144)
standard deviation 99.86 (85.8 - 115)
number of samples 66
the 90-percentile 233 (195 - 292)
mean d/s river quality 127 (122 - 133)
standard deviation 100 (96.6 - 104)
number of samples 984
the 90-percentile 239 (227 - 251)
calculate
sensitivity
mean discharge quality 2711.94 (2705 - 2718)
standard deviation 567.59 (563 - 572)
number of samples 20491
the 95-percentile 3731 (3718 - 3745)
the 99-percentile 4297 (4278 - 4317)
the 99.5-percentile 4525 (4503 - 4548)
Excel
Word
Note
menu
quit
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.262
OUT


Tony Warn ... (Version 6.0) ... 14/10/20
discharge Caswell Outfall
river River Tove
pollutant Total SS
MASS BALANCE: Monte Carlo
Calculations: 17 November 2025 at 04:28
mean upstream river flow 60.394
the 95-percentile low flow 10.022
mean discharge flow 0.062
standard deviation 0.034
downstream target 46222.0
corresponding percentile 90
calculate required discharge quality
calculate impact of input discharge quality
old data - WORD
old data - EXCEL
old data - NOTE
new discharge
mean u/s river quality 3177.50 (15697 - 30658)
standard deviation 5053.69 (38137 - 48671)
number of samples 100
the 90-percentile 51042 (39138 - 69936)
mean d/s river quality 23136 (16396 - 29877)
standard deviation 46559 (41809 - 51310)
number of samples 131
the 90-percentile 50998 (40195 - 67223)
calculate
sensitivity
mean discharge quality 6510.23 (6478 - 6543)
standard deviation 2838.50 (2815 - 2862)
number of samples 20491
the 95-percentile 11853 (11767 - 11941)
the 99-percentile 15750 (15608 - 15898)
the 99.5-percentile 17478 (17307 - 17655)
Excel
Word
Note
menu
quit
INT
NPD
correlation: river and discharge flow 0.6000
correlation: river flow and quality -0.3000
correlation: discharge flow and quality -0.084
OUT