# A13.3: Water Quality Calculations

## 1 Introduction

1.1 This appendix provides additional information on the calculations used to inform the water quality assessment of the proposed Scheme, as reported in the Environmental Statement (ES) Chapter 13 (Road Drainage and the Water Environment).

1.2 As part of the water quality assessment, routine runoff and accidental spillage risk to the surface water features (SWFs) proposed to receive road drainage were assessed using the Highways England's (formally Highways Agency) Water Risk Assessment Tool (HAWRAT), in line with DMRB Volume 11, Section 3, Part 10, HD45/09 Road Drainage and the Water Environment, 2009 (Highways Agency, Scottish Government, Welsh Assembly Government and The Department for Regional Development Northern Ireland 2009).

1.3 This appendix is set out as follows:

- the treatment efficiency calculations can be found in Section 2;
- the routine runoff parameters and results for the A96 Dualling Inverness to Nairn (including Nairn Bypass) can be found in Section 3;
- the results of the spillage risk assessment for the A96 Dualling Inverness to Nairn (including Nairn Bypass) can be found in Section 4; and
- the routine runoff parameters and results for the existing A96 (Do Minimum) can be found in Section 5.

## 2 Treatment Efficiency Calculations

**Treatment Efficiency Calculations – Individual Assessments**

2.1 The proposed drainage strategy includes two types of treatment train – each outfall would use one or the other. Treatment Train 1 would comprise two levels of treatment (Table 1); Treatment Train 2 (Table 2) would comprise three levels of treatment. The levels of treatment upstream of each outfall have been agreed with SEPA. SEPA requested a minimum level of SUDS treatment upstream of each outfall (three levels into the River Nairn and its tributaries; two levels for all other watercourses). In addition, Outfall O required three levels of treatment to pass all aspects of the HAWRAT routine runoff assessment (Treatment Train 2). This level of treatment has been included in the drainage design for this outfall. The level of treatment for each outfall is summarised in Chapter 13 (Road Drainage and the Water Environment), Section 13.8 (Mitigation), Table 13.21.

2.2 Values for the indicative treatment efficiencies of various drainage systems are provided in Table 3.2 of DMRB Volume 4, Section 2, Part 1, Vegetated Drainage Systems for Highway Runoff (Highways Agency, Transport Scotland, Welsh Assembly Government and The Department for Regional Development Northern Ireland 2006) and The SUDS Manual (CIRIA 2015). The limitations of these treatment efficiencies are described in Chapter 13 (Road Drainage and the Water Environment), Section 13.2 (Methodology) paragraph 13.2.72.

2.3 The calculations for the treatment efficiencies of each treatment train are shown in the following text. The figures shown in bold text have been used in the Step 3 routine runoff assessment. The treatment efficiencies and treatment efficiency calculations presented below were sent to SEPA for comment in May 2016 along with the results of the HAWRAT assessments. SEPA did not raise any concerns in relation to the use of these values.

<u>Treatment Train 1</u>

2.4 The first level of treatment would be achieved by using filter drains to capture runoff at source. The filter drains would run parallel to the carriageway. The second level of treatment would be achieved by using a SUDS retention pond.

2.5 Table 3.2 of DMRB HA103/06 does not include total system treatment efficiencies for a drainage system comprising a filter drain and a SUDS retention pond. Therefore, the individual treatment efficiencies given for filter drains and SUDS retention ponds in Table 3.2 of DMRB HA103/06 have been used to calculate the treatment efficiency for the whole system (Table 1).

**Table 1: Treatment Efficiencies for Treatment Train 1**

| Drainage System | Treatment Efficiencies (%) | |
|---|---|---|
| | Metals | Total Suspended Solids |
| Filter drain | 7 | 38 |
| SUDS retention pond | 35 | 62 |
| **Total system** | **40** | **76** |

*Calculation for Treatment of Solubles:*

2.6 100% x (1 - 0.07) x (1 - 0.35) = 60% solubles remaining after treatment, meaning that the treatment efficiency (relevant to soluble acute impacts) is **40%**.

*Calculation for Settlement of Sediment:*

2.7 100% x (1 - 0.38) x (1 - 0.62) = 24% sediment remaining after treatment, meaning that the settlement efficiency (relevant to sediment chronic impacts) is **76%**.

Treatment Train 2

2.8 In addition to the two treatments described for Treatment Train 1, Treatment Train 2 would include a third level of treatment. The third level of treatment would comprise a grassed swale downstream from the SUDS retention pond, prior to final outfall.

2.9 Table 3.2 of DMRB HA103/06 does not include total system treatment efficiencies for a drainage system comprising a filter drain, a SUDS retention pond and a swale. In addition, Table 3.2 does not include individual treatment efficiencies for a swale.

2.10 Similar to the approach for Treatment Train 1, the individual treatment efficiencies given for filter drains and SUDS retention ponds in Table 3.2 of DMRB HA103/06 have been used to calculate the treatment efficiency for the whole system (Table 2).

2.11 In relation to the treatment efficiencies for a swale, The SUDS Manual (CIRIA 2015) states that *'median pollutant mass removal rates of swales from available performance studies have been reported as 76% for total suspended solids…Significant reductions in total zinc and copper event mean concentrations have been observed in performance studies with a median value of 60%'*. In the absence of treatment efficiencies for swale in Table 3.2 of the DMRB, the values from The SUDS Manual have been used to work out the treatment efficiency for the whole system (Table 2).

**Table 2: Treatment Efficiencies for Treatment Train 2**

| Drainage System | Treatment Efficiencies (%) | |
|---|---|---|
| | Metals | Total Suspended Solids |
| Filter drain | 7 | 38 |
| SUDS retention pond | 35 | 62 |
| Swale | 60 | 76 |
| **Total system** | **76** | **94** |

*Calculation for Treatment of Solubles:*

2.12 100% x (1 - 0.07) x (1 - 0.35) x (1 - 0.60) = 24%; therefore treatment efficiency (relevant to soluble acute impacts) is **76%**.

*Calculation for Settlement of Sediment:*

2.13 100% x (1 - 0.38) x (1 - 0.62) x (1 - 0.76) = 6%; therefore settlement efficiency (relevant to sediment chronic impacts) is **94%**.

# 3 Routine Runoff Assessment (Do Something) – HAWRAT Output Sheets (User Parameters and Results)

## Routine Runoff Parameters (Individual Assessments)

### Drainage Catchment A

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 02 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | A | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment A | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>=50,000 and <100,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.011*** | |
| Baseflow Index | - | 0.5 | ***0.764*** | |
| Impermeable road area drained | ha | 1 | ***0.89*** | |
| Permeable area draining to outfall | ha | 1 | ***0*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.7*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

### Drainage Catchment B

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 02 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | B | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment B | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.011*** | |
| Baseflow Index | - | 0.5 | ***0.764*** | |
| Impermeable road area drained | ha | 1 | ***1.15*** | |
| Permeable area draining to outfall | ha | 1 | ***0.15*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.7*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment C

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | | Non-cumulative assessment (single outfall) | | |
| **HA Area/DBFO number** | | | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | | SWF 02 | | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | | Jane Huxtable, Jacobs | | |
| | **Northing** | | **Date of assessment** | | 18/10/2016 | | |
| **Outfall number** | C | | **Version of assessment** | | 1 | | |
| **List of outfalls in cumulative assessment** | | | | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment C | | | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.011*** | |
| Baseflow Index | - | 0.5 | ***0.764*** | |
| Impermeable road area drained | ha | 1 | ***2.68*** | |
| Permeable area draining to outfall | ha | 1 | ***0.92*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.7*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment D

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | | Non-cumulative assessment (single outfall) | | |
| **HA Area/DBFO number** | | | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | | SWF 03 | | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | | Jane Huxtable, Jacobs | | |
| | **Northing** | | **Date of assessment** | | 18/10/2016 | | |
| **Outfall number** | D | | **Version of assessment** | | 1 | | |
| **List of outfalls in cumulative assessment** | | | | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment D | | | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.011*** | |
| Baseflow Index | - | 0.5 | ***0.606*** | |
| Impermeable road area drained | ha | 1 | ***1.43*** | |
| Permeable area draining to outfall | ha | 1 | ***0.33*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1.5*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment E

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 03 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 18/10/2016 | |
| **Outfall number** | E | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment E | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.011*** | | |
| Baseflow Index | - | 0.5 | ***0.606*** | | |
| Impermeable road area drained | ha | 1 | ***1.27*** | | |
| Permeable area draining to outfall | ha | 1 | ***0.21*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1.5*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** | |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Proposed settlement of sediments | % | 0 | ***0*** | | |

## Drainage Catchment F

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 06 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 18/10/2016 | |
| **Outfall number** | F | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment F | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.01*** | | |
| Baseflow Index | - | 0.5 | ***0.679*** | | |
| Impermeable road area drained | ha | 1 | ***4.3*** | | |
| Permeable area draining to outfall | ha | 1 | ***0.74*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1.2*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** | Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***10.8*** | | |
| Proposed settlement of sediments | % | 0 | ***76*** | | |

## Drainage Catchment G

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 08 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 18/10/2016 | |
| **Outfall number** | G | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment G | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.003*** | | |
| Baseflow Index | - | 0.5 | ***0.762*** | | |
| Impermeable road area drained | ha | 1 | ***2.26*** | | |
| Permeable area draining to outfall | ha | 1 | ***1.14*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.4*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** | Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***9.9*** | | |
| Proposed settlement of sediments | % | 0 | ***76*** | | |

## Drainage Catchment H

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 09 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 18/10/2016 | |
| **Outfall number** | H | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment H | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.006*** | | |
| Baseflow Index | - | 0.5 | ***0.694*** | | |
| Impermeable road area drained | ha | 1 | ***2.8*** | | |
| Permeable area draining to outfall | ha | 1 | ***0.72*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***2*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***76*** | ***description for proposed measures*** | Filter drain, swale and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***8.2*** | | |
| Proposed settlement of sediments | % | 0 | ***94*** | | |

## Drainage Catchment I

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 09 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | I | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment I | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.006*** | |
| Baseflow Index | - | 0.5 | ***0.694*** | |
| Impermeable road area drained | ha | 1 | ***2.28*** | |
| Permeable area draining to outfall | ha | 1 | ***0.7*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***2*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***7.3*** | |
| Proposed settlement of sediments | % | 0 | ***76*** | |

## Drainage Catchment J

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 13 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | J | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment J | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.002*** | |
| Baseflow Index | - | 0.5 | ***0.833*** | |
| Impermeable road area drained | ha | 1 | ***1.66*** | |
| Permeable area draining to outfall | ha | 1 | ***0.52*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.7*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***5.3*** | |
| Proposed settlement of sediments | % | 0 | ***76*** | |

## Drainage Catchment K

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 13 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | K | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment K | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.002*** | |
| Baseflow Index | - | 0.5 | ***0.833*** | |
| Impermeable road area drained | ha | 1 | ***0.76*** | |
| Permeable area draining to outfall | ha | 1 | ***0.25*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.7*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***2.6*** | |
| Proposed settlement of sediments | % | 0 | ***76*** | |

## Drainage Catchment L

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 16 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | L | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment L | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.01*** | |
| Baseflow Index | - | 0.5 | ***0.678*** | |
| Impermeable road area drained | ha | 1 | ***2.65*** | |
| Permeable area draining to outfall | ha | 1 | ***0.36*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.4*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment V

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 16 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | V | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment V | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.01*** | |
| Baseflow Index | - | 0.5 | ***0.678*** | |
| Impermeable road area drained | ha | 1 | ***2.83*** | |
| Permeable area draining to outfall | ha | 1 | ***0.82*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.4*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment M

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 16 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | M | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment M | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.01*** | |
| Baseflow Index | - | 0.5 | ***0.678*** | |
| Impermeable road area drained | ha | 1 | ***3.81*** | |
| Permeable area draining to outfall | ha | 1 | ***1.04*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.4*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment N

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 18 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | N | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment N | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.009*** | |
| Baseflow Index | - | 0.5 | ***0.772*** | |
| Impermeable road area drained | ha | 1 | ***4*** | |
| Permeable area draining to outfall | ha | 1 | ***0.86*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1.2*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***10.7*** | |
| Proposed settlement of sediments | % | 0 | ***76*** | |

## Drainage Catchment O - Tier 1, Treatment Train 1

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 19 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 26/10/2016 |
| **Outfall number** | O | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment O | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.001*** | |
| Baseflow Index | - | 0.5 | ***0.652*** | |
| Impermeable road area drained | ha | 1 | ***3.88*** | |
| Permeable area draining to outfall | ha | 1 | ***1.05*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.8*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***11.3*** | |
| Proposed settlement of sediments | % | 0 | ***76*** | |

## Drainage Catchment O - Tier 2, Treatment Train 1

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | | Non-cumulative assessment (single outfall) | | |
| **HA Area/DBFO number** | | | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | | SWF 19 | | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | | Jane Huxtable, Jacobs | | |
| | **Northing** | | **Date of assessment** | | 19/10/2016 | | |
| **Outfall number** | O | | **Version of assessment** | | 1 | | |
| **List of outfalls in cumulative assessment** | | | | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment O | | | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.001*** | | |
| Baseflow Index | - | 0.5 | ***0.652*** | | |
| Impermeable road area drained | ha | 1 | ***3.88*** | | |
| Permeable area draining to outfall | ha | 1 | ***1.05*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***FALSE*** | | |
| Use Tier 2 | - | FALSE | ***TRUE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***5*** | | |
| Tier2 Bed width | m | 3 | ***1*** | | |
| Tier2 Side slope | m/m | 0.5 | ***3.71*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.04*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** | Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***11.33*** | | |
| Proposed settlement of sediments | % | 0 | ***76*** | | |

## Drainage Catchment O - Tier 2, Treatment Train 2

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | | Non-cumulative assessment (single outfall) | | |
| **HA Area/DBFO number** | | | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | | SWF 19 | | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | | Jane Huxtable, Jacobs | | |
| | **Northing** | | **Date of assessment** | | 19/10/2016 | | |
| **Outfall number** | O | | **Version of assessment** | | 1 | | |
| **List of outfalls in cumulative assessment** | | | | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment O | | | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.001*** | | |
| Baseflow Index | - | 0.5 | ***0.652*** | | |
| Impermeable road area drained | ha | 1 | ***3.88*** | | |
| Permeable area draining to outfall | ha | 1 | ***1.05*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***FALSE*** | | |
| Use Tier 2 | - | FALSE | ***TRUE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***5*** | | |
| Tier2 Bed width | m | 3 | ***1*** | | |
| Tier2 Side slope | m/m | 0.5 | ***3.71*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.04*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***76*** | ***description for proposed measures*** | Filter drain, swale and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***11.33*** | | |
| Proposed settlement of sediments | % | 0 | ***94*** | | |

## Drainage Catchment P

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 19 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | P | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment P | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.005*** | |
| Baseflow Index | - | 0.5 | ***0.652*** | |
| Impermeable road area drained | ha | 1 | ***1.4*** | |
| Permeable area draining to outfall | ha | 1 | ***0.19*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.8*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment Q

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 19 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 19/10/2016 |
| **Outfall number** | Q | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment Q | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.005*** | |
| Baseflow Index | - | 0.5 | ***0.652*** | |
| Impermeable road area drained | ha | 1 | ***6*** | |
| Permeable area draining to outfall | ha | 1 | ***1.85*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.8*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***18.55*** | |
| Proposed settlement of sediments | % | 0 | ***76*** | |

## Drainage Catchment R

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 22 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | R | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment R | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.012*** | |
| Baseflow Index | - | 0.5 | ***0.755*** | |
| Impermeable road area drained | ha | 1 | ***2.66*** | |
| Permeable area draining to outfall | ha | 1 | ***0.33*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1.2*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment S

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 23 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | S | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment S | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.853*** | |
| Baseflow Index | - | 0.5 | ***0.587*** | |
| Impermeable road area drained | ha | 1 | ***3.83*** | |
| Permeable area draining to outfall | ha | 1 | ***0.37*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***9.5*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment T

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 24 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | T | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment T | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.003*** | |
| Baseflow Index | - | 0.5 | ***0.874*** | |
| Impermeable road area drained | ha | 1 | ***2.24*** | |
| Permeable area draining to outfall | ha | 1 | ***0.13*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.5*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***76*** | ***description for proposed measures*** Filter drain, swale and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***4.8*** | |
| Proposed settlement of sediments | % | 0 | ***94*** | |

## Drainage Catchment U

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 24 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | U | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment U | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.003*** | |
| Baseflow Index | - | 0.5 | ***0.874*** | |
| Impermeable road area drained | ha | 1 | ***5.15*** | |
| Permeable area draining to outfall | ha | 1 | ***1.38*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.5*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***76*** | ***description for proposed measures*** Filter drain, swale and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***24.15*** | |
| Proposed settlement of sediments | % | 0 | ***94*** | |

## Drainage Catchment W

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 26 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | W | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment W | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.038*** | |
| Baseflow Index | - | 0.5 | ***0.732*** | |
| Impermeable road area drained | ha | 1 | ***1.9*** | |
| Permeable area draining to outfall | ha | 1 | ***0.43*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment X

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 26 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | X | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment X | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.031*** | |
| Baseflow Index | - | 0.5 | ***0.732*** | |
| Impermeable road area drained | ha | 1 | ***1.72*** | |
| Permeable area draining to outfall | ha | 1 | ***0.22*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment Y

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 26 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | Y | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment Y | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.031*** | |
| Baseflow Index | - | 0.5 | ***0.732*** | |
| Impermeable road area drained | ha | 1 | ***2.96*** | |
| Permeable area draining to outfall | ha | 1 | ***0.49*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment Z

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 35 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | Z | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment Z | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.003*** | |
| Baseflow Index | - | 0.5 | ***0.573*** | |
| Impermeable road area drained | ha | 1 | ***4.97*** | |
| Permeable area draining to outfall | ha | 1 | ***0.94*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***76*** | ***description for proposed measures*** Filter drain, swale and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***19.39*** | |
| Proposed settlement of sediments | % | 0 | ***94*** | |

## Routine Runoff Parameters (Cumulative Assessments)

### Drainage Catchments A, B & C

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment excluding sediments (outfalls between 100m and 1km apart) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 02 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 18/10/2016 | |
| **Outfall number** | | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | A, B & C | | | | |
| **Notes** | DS 2036: Cumulative Routine Runoff Assessment for Catchments A, B & C | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>=50,000 and <100,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.011*** | | |
| Baseflow Index | - | 0.5 | ***0.764*** | | |
| Impermeable road area drained | ha | 1 | ***4.72*** | | |
| Permeable area draining to outfall | ha | 1 | ***1.07*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** | Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***9.3*** | | |
| Proposed settlement of sediments | % | 0 | ***0*** | | |

### Drainage Catchments B & C

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment including sediments (outfalls within 100m) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 02 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 26/10/2016 | |
| **Outfall number** | | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | B & C | | | | |
| **Notes** | DS 2036: Cumulative Routine Runoff Assessment for Catchments B & C | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>=50,000 and <100,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.011*** | | |
| Baseflow Index | - | 0.5 | ***0.764*** | | |
| Impermeable road area drained | ha | 1 | ***3.83*** | | |
| Permeable area draining to outfall | ha | 1 | ***1.07*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.7*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** | Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***9.3*** | | |
| Proposed settlement of sediments | % | 0 | ***76*** | | |

## Drainage Catchments D & E

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment including sediments (outfalls within 100m) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 03 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | D & E | | | |
| **Notes** | DS 2036: Cumulative Routine Runoff Assessment for Catchments D & E | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.011*** | |
| Baseflow Index | - | 0.5 | ***0.606*** | |
| Impermeable road area drained | ha | 1 | ***2.7*** | |
| Permeable area draining to outfall | ha | 1 | ***0.54*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1.5*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***3.2*** | |
| Proposed settlement of sediments | % | 0 | ***76*** | |

## Drainage Catchments H & I, Tier 1, Treatment Train 1

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment including sediments (outfalls within 100m) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 09 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 19/10/2016 |
| **Outfall number** | | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | H & I | | | |
| **Notes** | DS 2036: Cumulative Routine Runoff Assessment for Catchments H & I | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.006*** | |
| Baseflow Index | - | 0.5 | ***0.694*** | |
| Impermeable road area drained | ha | 1 | ***5.08*** | |
| Permeable area draining to outfall | ha | 1 | ***1.42*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***2*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***8.2*** | |
| Proposed settlement of sediments | % | 0 | ***76*** | |

## Drainage Catchments H & I, Tier 2, Treatment Train 1

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment including sediments (outfalls within 100m) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 09 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 19/10/2016 | |
| **Outfall number** | | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | H & I | | | | |
| **Notes** | DS 2036: Cumulative Routine Runoff Assessment for Catchments H & I | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.006*** | | |
| Baseflow Index | - | 0.5 | ***0.694*** | | |
| Impermeable road area drained | ha | 1 | ***5.08*** | | |
| Permeable area draining to outfall | ha | 1 | ***1.42*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***FALSE*** | | |
| Use Tier 2 | - | FALSE | ***TRUE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***5*** | | |
| Tier2 Bed width | m | 3 | ***1.52*** | | |
| Tier2 Side slope | m/m | 0.5 | ***3.15*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.01*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.04*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** | Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***8.2*** | | |
| Proposed settlement of sediments | % | 0 | ***76*** | | |

## Drainage Catchments J & K

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment excluding sediments (outfalls between 100m and 1km apart) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 13 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 18/10/2016 | |
| **Outfall number** | | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | J & K | | | | |
| **Notes** | DS 2036: Cumulative Routine Runoff Assessment for Catchments J & K | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.002*** | | |
| Baseflow Index | - | 0.5 | ***0.833*** | | |
| Impermeable road area drained | ha | 1 | ***2.42*** | | |
| Permeable area draining to outfall | ha | 1 | ***0.77*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.5*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** | Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***2.6*** | | |
| Proposed settlement of sediments | % | 0 | ***N/A*** | | |

## Drainage Catchments L, M & V

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment including sediments (outfalls within 100m) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 16 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | L, M & V | | | |
| **Notes** | DS 2036: Cumulative Routine Runoff Assessment for Catchments L, M & V | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.01*** | | |
| Baseflow Index | - | 0.5 | ***0.678*** | | |
| Impermeable road area drained | ha | 1 | ***9.29*** | | |
| Permeable area draining to outfall | ha | 1 | ***2.22*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.4*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** | Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***6*** | | |
| Proposed settlement of sediments | % | 0 | ***76*** | | |

## Drainage Catchments P & Q, Tier 1, Treatment Train 1

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment including sediments (outfalls within 100m) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 19 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 19/10/2016 |
| **Outfall number** | | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | P & Q | | | |
| **Notes** | DS 2036: Cumulative Routine Runoff Assessment for Catchments P & Q | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.005*** | | |
| Baseflow Index | - | 0.5 | ***0.652*** | | |
| Impermeable road area drained | ha | 1 | ***7.4*** | | |
| Permeable area draining to outfall | ha | 1 | ***2.04*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.8*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** | Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***3.07*** | | |
| Proposed settlement of sediments | % | 0 | ***76*** | | |

## Drainage Catchments P & Q, Tier 2, Treatment Train 1

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment including sediments (outfalls within 100m) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 19 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 19/10/2016 |
| **Outfall number** | | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | P & Q | | | |
| **Notes** | DS 2036: Routine Runoff Assessment for Catchment P & Q | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.005*** | | |
| Baseflow Index | - | 0.5 | ***0.652*** | | |
| Impermeable road area drained | ha | 1 | ***7.4*** | | |
| Permeable area draining to outfall | ha | 1 | ***2.04*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***FALSE*** | | |
| Use Tier 2 | - | FALSE | ***TRUE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***5*** | | |
| Tier2 Bed width | m | 3 | ***0.35*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.84*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.02*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.04*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***40*** | ***description for proposed measures*** | Filter drain and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***3.07*** | | |
| Proposed settlement of sediments | % | 0 | ***76*** | | |

## Drainage Catchments T & U

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment including sediments (outfalls within 100m) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 24 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | T & U | | | |
| **Notes** | DS 2036: Cumulative Routine Runoff Assessment for Catchments T & U | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.003*** | | |
| Baseflow Index | - | 0.5 | ***0.874*** | | |
| Impermeable road area drained | ha | 1 | ***7.39*** | | |
| Permeable area draining to outfall | ha | 1 | ***1.51*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.5*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***76*** | ***description for proposed measures*** | Filter drain, swale and wet retention pond. |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***4.8*** | | |
| Proposed settlement of sediments | % | 0 | ***94*** | | |

## Drainage Catchments X & Y

| | | | | |
|---|---|---|---|---|
| **Road Number** | A96 Dualling Inverness to Nairn (including Nairn Bypass) | | **Assessment type** | Cumulative assessment including sediments (outfalls within 100m) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 26 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 18/10/2016 |
| **Outfall number** | | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | X & Y | | | |
| **Notes** | DS 2036: Cumulative Routine Runoff Assessment for Catchments X & Y | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.031*** | |
| Baseflow Index | - | 0.5 | ***0.732*** | |
| Impermeable road area drained | ha | 1 | ***4.68*** | |
| Permeable area draining to outfall | ha | 1 | ***0.71*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

# Routine Runoff Results - DS (Individual Assessments)

## Drainage Catchment A

### Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | *Step1* | | | | | | | | | | |
| | *Step2* | | | | | | | | | | |
| | *Step3* | | | | | | | | | | |

### DETAILED RESULTS

#### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **78.70** | **70.40** |
| No. of exceedances/worst year | | 97 | 81 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **27.80** | **29.80** |
| No. of exceedances/worst year | | 36 | 37 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 28.38 | 85.11 |
| | 90%ile | 55.48 | 185.53 |
| | 95%ile | 66.83 | 244.68 |
| | 99%ile | 117.11 | 468.03 |

*Step 1*

| | | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | **97.40** | **127.00** | **2.40** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | | 112 | 143 | 8 | 59 | 127 | 59 | 32 | 101 |
| | | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| | ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics | Mean | 398 | 1647 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 864 | 3634 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 1121 | 4759 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 1592 | 7288 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

#### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0** | **0.1** |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0** | **0** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.10 | 0.33 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 0.33 | 1.13 |
| | 90%ile | 0.86 | 2.26 |
| | 95%ile | 1.68 | 4.53 |
| | 99%ile | 4.49 | 21.35 |

*Step 2*

**Velocity** 0.17 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

#### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment B

## Summary of predictions

**Soluble - Acute Impact**

| Prediction of impact | | Copper | Zinc |
|---|---|---|---|
| | Step1 | | |
| | Step2 | | |
| | Step3 | | |

**Sediment - Chronic Impact**

| Prediction of impact | | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|
| | Step1 | | | | | | | | |
| | Step2 | | | | | | | | |
| | Step3 | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|
| | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics | Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.1 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.10 | 0.33 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.34 | 1.12 |
| | 90%ile | 0.89 | 2.26 |
| | 95%ile | 1.77 | 4.58 |
| | 99%ile | 4.51 | 21.01 |

**Step 2**

**Velocity** 0.17 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment C

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.1 | 0.6 |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0.1 | 0.3 |
| No. of exceedances/worst summer | | 1 | 1 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.23 | 0.71 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.69 | 2.21 |
| | 90%ile | 1.91 | 4.89 |
| | 95%ile | 3.69 | 9.40 |
| | 99%ile | 8.52 | 38.47 |

**Step 2**

**Velocity** 0.17 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment D

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.1 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.12 | 0.39 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.39 | 1.29 |
| | 90%ile | 1.01 | 2.58 |
| | 95%ile | 2.04 | 5.23 |
| | 99%ile | 5.31 | 25.18 |

**Step 2**

**Velocity** 0.05 m/s — Tier 1 is used for the calculation

**DI** 66.27

**% settlement needed** 0 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment E

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.1 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.11 | 0.35 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.36 | 1.17 |
| | 90%ile | 0.91 | 2.30 |
| | 95%ile | 1.82 | 4.73 |
| | 99%ile | 4.86 | 23.02 |

**Step 2**

**Velocity** 0.05 m/s — Tier 1 is used for the calculation

**DI** 58.86

**% settlement needed** 0 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment F

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.2** | **1.3** |
| No. of exceedances/worst year | | 1 | 4 |
| No. of exceedances/summer | | 0.1 | 0.8 |
| No. of exceedances/worst summer | | 1 | 4 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0** | **0.2** |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.37 | 1.14 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 1.08 | 3.36 |
| | 90%ile | 3.00 | 7.78 |
| | 95%ile | 5.90 | 14.66 |
| | 99%ile | 12.32 | 54.55 |

**Step 2**

**Velocity** 0.06 m/s — Tier 1 is used for the calculation

**DI** 161.44

**% settlement needed** 39 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.00** | **0.10** |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0.00** | **0.00** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.22 | 0.70 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.62 | 1.88 |
| | 90%ile | 1.78 | 4.46 |
| | 95%ile | 3.27 | 8.78 |
| | 99%ile | 6.90 | 30.43 |

**DI** 38.75

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment G

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RST24 | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 81 | 64 | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | RST6 | | | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | | | | | | | | |
| **No. of exceedances/year** | | 18.00 | 20.60 | | | | | | | | |
| No. of exceedances/worst year | | 24 | 27 | | | | | | | | |
| | | (ug/l) | (ug/l) | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | RST24 | 21 | 60 | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Thresholds | RST6 | 42 | 120 | | | | | | | | |
| Event Statistics | Mean | 23.36 | 67.70 | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 45.65 | 147.58 | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 54.99 | 194.62 | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 96.36 | 372.28 | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.8 | 2 |
| No. of exceedances/worst year | | 2 | 5 |
| No. of exceedances/summer | | 0.4 | 1.1 |
| No. of exceedances/worst summer | | 2 | 5 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.4 |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0.1 |
| No. of exceedances/worst summer | | 0 | 1 |
| Annual average concentration (ug/l) | | 0.57 | 1.78 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 1.61 | 4.93 |
| | 90%ile | 5.00 | 12.20 |
| | 95%ile | 8.54 | 22.14 |
| | 99%ile | 15.87 | 68.27 |

*Step 2*

**Velocity** 0.12 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.10 | 0.60 |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0 | 0.3 |
| No. of exceedances/worst summer | | 0 | 2 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.34 | 1.07 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.96 | 2.92 |
| | 90%ile | 2.97 | 7.21 |
| | 95%ile | 5.03 | 13.28 |
| | 99%ile | 9.52 | 40.96 |

**DI** -

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment H

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| *Toxicity Threshold* | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.3 | 1.4 |
| No. of exceedances/worst year | | 1 | 4 |
| No. of exceedances/summer | | 0.1 | 0.9 |
| No. of exceedances/worst summer | | 1 | 4 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.2 |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.39 | 1.21 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 1.14 | 3.55 |
| | 90%ile | 3.21 | 8.12 |
| | 95%ile | 6.24 | 15.61 |
| | 99%ile | 12.69 | 56.37 |

*Step 2*

**Velocity** 0.02 m/s — Tier 1 is used for the calculation

**DI** 282.62

**% settlement needed** 65 %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.09 | 0.30 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 0.27 | 0.81 |
| | 90%ile | 0.76 | 1.92 |
| | 95%ile | 1.40 | 3.75 |
| | 99%ile | 3.01 | 13.52 |

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment I

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|
| | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | *Toxicity Threshold* | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics | Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.2 | 1 |
| No. of exceedances/worst year | | 1 | 3 |
| No. of exceedances/summer | | 0.1 | 0.6 |
| No. of exceedances/worst summer | | 1 | 3 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.1 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.33 | 1.02 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 0.97 | 3.05 |
| | 90%ile | 2.68 | 7.05 |
| | 95%ile | 5.38 | 13.28 |
| | 99%ile | 11.37 | 50.85 |

*Step 2*

**Velocity** 0.02 m/s — Tier 1 is used for the calculation

**DI** 230.14

**% settlement needed** 57 %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.00 | 0.10 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.20 | 0.62 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 0.57 | 1.74 |
| | 90%ile | 1.60 | 4.02 |
| | 95%ile | 3.02 | 7.94 |
| | 99%ile | 6.73 | 29.43 |

**DI** 55.23

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment J

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **1.1** | **2.1** |
| No. of exceedances/worst year | | 3 | 5 |
| No. of exceedances/summer | | 0.5 | 1.1 |
| No. of exceedances/worst summer | | 2 | 5 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0** | **0.4** |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0.1 |
| No. of exceedances/worst summer | | 0 | 1 |
| Annual average concentration (ug/l) | | 0.63 | 1.93 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 1.74 | 5.31 |
| | 90%ile | 5.43 | 13.22 |
| | 95%ile | 9.14 | 23.99 |
| | 99%ile | 17.06 | 74.39 |

**Step 2**

**Velocity** 0.03 m/s

Tier 1 is used for the calculation

**DI** 346.01

**% settlement needed** 72 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **0.10** | **0.80** |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0 | 0.4 |
| No. of exceedances/worst summer | | 0 | 2 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.00** | **0.00** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.38 | 1.17 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 1.03 | 3.11 |
| | 90%ile | 3.17 | 7.64 |
| | 95%ile | 5.34 | 14.15 |
| | 99%ile | 10.23 | 44.57 |

**DI** 83.04

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment K

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|
| | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | *Toxicity Threshold* | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics | Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.2 | 1.2 |
| No. of exceedances/worst year | | 1 | 4 |
| No. of exceedances/summer | | 0.1 | 0.8 |
| No. of exceedances/worst summer | | 1 | 4 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.1 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.33 | 1.04 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 0.99 | 3.10 |
| | 90%ile | 2.87 | 7.27 |
| | 95%ile | 5.30 | 13.40 |
| | 99%ile | 11.32 | 50.10 |

*Step 2*

**Velocity** 0.03 m/s — Tier 1 is used for the calculation

**DI** 158.41

**% settlement needed** 37 %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.00 | 0.10 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.20 | 0.63 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 0.58 | 1.78 |
| | 90%ile | 1.71 | 4.25 |
| | 95%ile | 3.08 | 7.98 |
| | 99%ile | 6.79 | 28.92 |

**DI** 38.02

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment L

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| *Toxicity Threshold* | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.1 | 0.7 |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0.1 | 0.4 |
| No. of exceedances/worst summer | | 1 | 2 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.24 | 0.76 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 0.74 | 2.35 |
| | 90%ile | 2.00 | 5.14 |
| | 95%ile | 4.06 | 9.93 |
| | 99%ile | 9.21 | 41.95 |

*Step 2*

**Velocity** 0.39 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment V

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.1 | 0.9 |
| No. of exceedances/worst year | | 1 | 3 |
| No. of exceedances/summer | | 0.1 | 0.6 |
| No. of exceedances/worst summer | | 1 | 3 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.25 | 0.80 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.77 | 2.45 |
| | 90%ile | 2.10 | 5.44 |
| | 95%ile | 4.27 | 10.52 |
| | 99%ile | 9.52 | 43.22 |

**Step 2**

**Velocity** 0.39 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment M

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **0.2** | **1.1** |
| No. of exceedances/worst year | | 1 | 3 |
| No. of exceedances/summer | | 0.1 | 0.7 |
| No. of exceedances/worst summer | | 1 | 3 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0** | **0.1** |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.33 | 1.02 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.98 | 3.06 |
| | 90%ile | 2.69 | 7.07 |
| | 95%ile | 5.40 | 13.32 |
| | 99%ile | 11.42 | 51.09 |

**Step 2**

**Velocity** 0.39 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment N

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| *Toxicity Threshold* | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.2 | 1.3 |
| No. of exceedances/worst year | | 1 | 4 |
| No. of exceedances/summer | | 0.1 | 0.8 |
| No. of exceedances/worst summer | | 1 | 4 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.2 |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.38 | 1.18 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 1.12 | 3.49 |
| | 90%ile | 3.30 | 8.15 |
| | 95%ile | 5.96 | 15.20 |
| | 99%ile | 12.67 | 54.71 |

*Step 2*

**Velocity** 0.06 m/s — Tier 1 is used for the calculation

**DI** 195.67

**% settlement needed** 49 %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.00 | 0.10 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.23 | 0.72 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 0.65 | 1.97 |
| | 90%ile | 1.91 | 4.72 |
| | 95%ile | 3.44 | 9.11 |
| | 99%ile | 7.13 | 31.51 |

**DI** 46.96

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment O, Tier 1, Treatment Train 1

## Summary of predictions

| Prediction of impact | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| *Step1* | | | | | | | | | | |
| *Step2* | | | | | | | | | | |
| *Step3* | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

| | *Step 1* Copper | *Step 1* Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|---|
| | RST24 | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **63.00** | **56.70** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 81 | 64 | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | RST6 | | | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | | | | | | | | |
| **No. of exceedances/year** | **18.00** | **20.60** | | | | | | | | |
| No. of exceedances/worst year | 24 | 27 | | | | | | | | |
| | *(ug/l)* | *(ug/l)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| Thresholds *RST24* | 21 | 60 | *Toxicity Threshold* 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Thresholds *RST6* | 42 | 120 | | | | | | | | |
| Event Statistics Mean | 23.36 | 67.70 | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 45.65 | 147.58 | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 54.99 | 194.62 | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 96.36 | 372.28 | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

| | *Step 2* Copper | *Step 2* Zinc |
|---|---|---|
| | RST24 | |
| Allowable Exceedances/year | 2 | 2 |
| **No. of exceedances/year** | **5.7** | **6.6** |
| No. of exceedances/worst year | 10 | 15 |
| No. of exceedances/summer | 3.1 | 2.9 |
| No. of exceedances/worst summer | 8 | 14 |
| | RST6 | |
| Allowable Exceedances/year | 1 | 1 |
| **No. of exceedances/year** | **0.9** | **1.9** |
| No. of exceedances/worst year | 3 | 4 |
| No. of exceedances/summer | 0.3 | 0.9 |
| No. of exceedances/worst summer | 2 | 4 |
| Annual average concentration (ug/l) | 1.72 | 5.33 |
| | *(ug/l)* | *(ug/l)* |
| Thresholds *RST24* | 21 | 60 |
| Thresholds *RST6* | 42 | 120 |
| Event Statistics Mean | 4.27 | 12.52 |
| 90%ile | 12.21 | 32.09 |
| 95%ile | 18.44 | 54.07 |
| 99%ile | 35.26 | 130.17 |

**Velocity** 0.01 m/s — Tier 1 is used for the calculation

**DI** 1124.82

**% settlement needed** 92 %

### In River (with mitigation)

| | *Step 3* Copper | *Step 3* Zinc |
|---|---|---|
| | RST24 | |
| Allowable Exceedances/year | 2 | 2 |
| **No. of exceedances/year** | **1.60** | **2.80** |
| No. of exceedances/worst year | 3 | 6 |
| No. of exceedances/summer | 0.8 | 1.3 |
| No. of exceedances/worst summer | 2 | 5 |
| | RST6 | |
| Allowable Exceedances/year | 1 | 1 |
| **No. of exceedances/year** | **0.20** | **0.40** |
| No. of exceedances/worst year | 1 | 2 |
| No. of exceedances/summer | 0 | 0.1 |
| No. of exceedances/worst summer | 0 | 1 |
| Annual average concentration (ug/l) | 1.03 | 3.23 |
| | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds *RST24* | 21 | 60 |
| Thresholds *RST6* | 42 | 120 |
| Event Statistics Mean | 2.55 | 7.47 |
| 90%ile | 7.31 | 19.25 |
| 95%ile | 11.00 | 32.08 |
| 99%ile | 21.16 | 73.74 |

**DI** 269.96

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment O, Tier 2, Treatment Train 1

## Summary of predictions

| Prediction of impact | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| *Step1* | | | | | | | | | | |
| *Step2* | | | | | | | | | | |
| *Step3* | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

| | Step 1 Copper | Step 1 Zinc | Step 1 Copper | Step 1 Zinc | Step 1 Cadmium | Step 1 Total PAH | Step 1 Pyrene | Step 1 Fluoranthene | Step 1 Anthracene | Step 1 Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|---|
| | RST24 | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **63.00** | **56.70** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 81 | 64 | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | RST6 | | | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | | | | | | | | |
| **No. of exceedances/year** | **18.00** | **20.60** | | | | | | | | |
| No. of exceedances/worst year | 24 | 27 | | | | | | | | |
| | *(ug/l)* | *(ug/l)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| Thresholds *RST24* | 21 | 60 | ***Toxicity Threshold*** 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Thresholds *RST6* | 42 | 120 | | | | | | | | |
| Event Statistics Mean | 23.36 | 67.70 | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 45.65 | 147.58 | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 54.99 | 194.62 | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 96.36 | 372.28 | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

| | Step 2 Copper | Step 2 Zinc |
|---|---|---|
| | RST24 | |
| Allowable Exceedances/year | 2 | 2 |
| **No. of exceedances/year** | **5.7** | **6.6** |
| No. of exceedances/worst year | 10 | 15 |
| No. of exceedances/summer | 3.1 | 2.9 |
| No. of exceedances/worst summer | 8 | 14 |
| | RST6 | |
| Allowable Exceedances/year | 1 | 1 |
| **No. of exceedances/year** | **0.9** | **1.9** |
| No. of exceedances/worst year | 3 | 4 |
| No. of exceedances/summer | 0.3 | 0.9 |
| No. of exceedances/worst summer | 2 | 4 |
| Annual average concentration (ug/l) | 1.72 | 5.33 |
| | *(ug/l)* | *(ug/l)* |
| Thresholds *RST24* | 21 | 60 |
| Thresholds *RST6* | 42 | 120 |
| Event Statistics Mean | 4.27 | 12.52 |
| 90%ile | 12.21 | 32.09 |
| 95%ile | 18.44 | 54.07 |
| 99%ile | 35.26 | 130.17 |

**Velocity** 0.03 m/s — Tier 2 is used for the calculation

**DI** 1542.69

**% settlement needed** 94 %

### In River (with mitigation)

| | Step 3 Copper | Step 3 Zinc |
|---|---|---|
| | RST24 | |
| Allowable Exceedances/year | 2 | 2 |
| **No. of exceedances/year** | **1.60** | **2.80** |
| No. of exceedances/worst year | 3 | 6 |
| No. of exceedances/summer | 0.8 | 1.3 |
| No. of exceedances/worst summer | 2 | 5 |
| | RST6 | |
| Allowable Exceedances/year | 1 | 1 |
| **No. of exceedances/year** | **0.20** | **0.40** |
| No. of exceedances/worst year | 1 | 2 |
| No. of exceedances/summer | 0 | 0.1 |
| No. of exceedances/worst summer | 0 | 1 |
| Annual average concentration (ug/l) | 1.03 | 3.23 |
| | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds *RST24* | 21 | 60 |
| Thresholds *RST6* | 42 | 120 |
| Event Statistics Mean | 2.55 | 7.47 |
| 90%ile | 7.31 | 19.25 |
| 95%ile | 11.00 | 32.08 |
| 99%ile | 21.16 | 73.76 |

**DI** 370.24

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment O, Tier 2, Treatment Train 2

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|
| | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | *Toxicity Threshold* | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics | Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 5.7 | 6.6 |
| No. of exceedances/worst year | | 10 | 15 |
| No. of exceedances/summer | | 3.1 | 2.9 |
| No. of exceedances/worst summer | | 8 | 14 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.9 | 1.9 |
| No. of exceedances/worst year | | 3 | 4 |
| No. of exceedances/summer | | 0.3 | 0.9 |
| No. of exceedances/worst summer | | 2 | 4 |
| Annual average concentration (ug/l) | | 1.72 | 5.33 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 4.27 | 12.52 |
| | 90%ile | 12.21 | 32.09 |
| | 95%ile | 18.44 | 54.07 |
| | 99%ile | 35.26 | 130.17 |

*Step 2*

**Velocity** 0.03 m/s — Tier 2 is used for the calculation

**DI** 1542.69

**% settlement needed** 94 %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.10 | 0.30 |
| No. of exceedances/worst year | | 1 | 1 |
| No. of exceedances/summer | | 0 | 0.1 |
| No. of exceedances/worst summer | | 0 | 1 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.41 | 1.29 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 1.02 | 2.99 |
| | 90%ile | 2.92 | 7.70 |
| | 95%ile | 4.40 | 12.83 |
| | 99%ile | 8.46 | 29.51 |

**DI** 92.56

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment P

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.1 | 0.9 |
| No. of exceedances/worst year | | 1 | 3 |
| No. of exceedances/summer | | 0.1 | 0.6 |
| No. of exceedances/worst summer | | 1 | 3 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.25 | 0.79 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.77 | 2.45 |
| | 90%ile | 2.09 | 5.41 |
| | 95%ile | 4.25 | 10.45 |
| | 99%ile | 9.54 | 43.43 |

**Step 2**

**Velocity** 0.06 m/s

Tier 1 is used for the calculation

**DI** 81.27

**% settlement needed** 0 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment Q

## Summary of predictions

| Prediction of impact | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| | *Step1* | | | | | | | | | | |
| | *Step2* | | | | | | | | | | |
| | *Step3* | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **1.8** | **2.6** |
| No. of exceedances/worst year | | 4 | 5 |
| No. of exceedances/summer | | 1 | 1.3 |
| No. of exceedances/worst summer | | 3 | 5 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.2** | **0.8** |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0 | 0.4 |
| No. of exceedances/worst summer | | 0 | 2 |
| Annual average concentration (ug/l) | | 0.81 | 2.49 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 2.19 | 6.60 |
| | 90%ile | 6.55 | 16.48 |
| | 95%ile | 11.11 | 30.25 |
| | 99%ile | 21.53 | 93.30 |

*Step 2*

**Velocity** 0.06 m/s — Tier 1 is used for the calculation

**DI** 348.30

**% settlement needed** 72 %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **0.30** | **1.10** |
| No. of exceedances/worst year | | 1 | 3 |
| No. of exceedances/summer | | 0 | 0.6 |
| No. of exceedances/worst summer | | 0 | 3 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.00** | **0.10** |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.49 | 1.51 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 1.30 | 3.89 |
| | 90%ile | 3.85 | 9.80 |
| | 95%ile | 6.59 | 18.15 |
| | 99%ile | 12.86 | 54.59 |

**DI** 83.59

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment R

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|
| | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | *Toxicity Threshold* | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics | Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.1 | 0.4 |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0.1 | 0.2 |
| No. of exceedances/worst summer | | 1 | 1 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.21 | 0.66 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 0.65 | 2.07 |
| | 90%ile | 1.77 | 4.50 |
| | 95%ile | 3.41 | 8.69 |
| | 99%ile | 8.01 | 36.62 |

*Step 2*

**Velocity** 0.08 m/s — Tier 1 is used for the calculation

**DI** 79.42

**% settlement needed** 0 %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment S

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| *Toxicity Threshold* | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.00 | 0.01 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 0.02 | 0.06 |
| | 90%ile | 0.04 | 0.10 |
| | 95%ile | 0.08 | 0.21 |
| | 99%ile | 0.25 | 1.15 |

*Step 2*

**Velocity** 0.17 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment T

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **1** | **2** |
| No. of exceedances/worst year | | 2 | 5 |
| No. of exceedances/summer | | 0.5 | 1.1 |
| No. of exceedances/worst summer | | 2 | 5 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0** | **0.4** |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0.1 |
| No. of exceedances/worst summer | | 0 | 1 |
| Annual average concentration (ug/l) | | 0.59 | 1.82 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 1.66 | 5.10 |
| | 90%ile | 5.16 | 12.85 |
| | 95%ile | 8.77 | 22.86 |
| | 99%ile | 16.36 | 71.85 |

**Step 2**

**Velocity** 0.08 m/s — Tier 1 is used for the calculation

**DI** 135.64

**% settlement needed** 27 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.00** | **0.00** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0.00** | **0.00** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.14 | 0.45 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.38 | 1.15 |
| | 90%ile | 1.20 | 2.86 |
| | 95%ile | 2.03 | 5.33 |
| | 99%ile | 3.78 | 16.49 |

**DI** 8.14

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment U

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **2.6** | **3.4** |
| No. of exceedances/worst year | | 6 | 6 |
| No. of exceedances/summer | | 1.4 | 1.4 |
| No. of exceedances/worst summer | | 4 | 6 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0.4** | **1.1** |
| No. of exceedances/worst year | | 1 | 3 |
| No. of exceedances/summer | | 0.1 | 0.5 |
| No. of exceedances/worst summer | | 1 | 3 |
| Annual average concentration (ug/l) | | 1.06 | 3.28 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 2.80 | 8.38 |
| | 90%ile | 8.44 | 21.13 |
| | 95%ile | 13.36 | 38.42 |
| | 99%ile | 24.59 | 110.31 |

**Step 2**

**Velocity** 0.08 m/s — Tier 1 is used for the calculation

**DI** 311.86

**% settlement needed** 68 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.00** | **0.00** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0.00** | **0.00** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.25 | 0.79 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.67 | 2.01 |
| | 90%ile | 2.03 | 5.07 |
| | 95%ile | 3.20 | 9.22 |
| | 99%ile | 5.90 | 26.37 |

**DI** 18.71

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment W

## Summary of predictions

**Soluble - Acute Impact**

| Prediction of impact | | Copper | Zinc |
|---|---|---|---|
| | *Step1* | | |
| | *Step2* | | |
| | *Step3* | | |

**Sediment - Chronic Impact**

| Prediction of impact | | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|
| | *Step1* | | | | | | | | |
| | *Step2* | | | | | | | | |
| | *Step3* | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics Mean | | 23.36 | 67.70 |
| 90%ile | | 45.65 | 147.58 |
| 95%ile | | 54.99 | 194.62 |
| 99%ile | | 96.36 | 372.28 |

*Step 1*

| | | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|
| | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| Thresholds | ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0** | **0** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0** | **0** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.05 | 0.16 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics Mean | | 0.17 | 0.57 |
| 90%ile | | 0.43 | 1.06 |
| 95%ile | | 0.84 | 2.24 |
| 99%ile | | 2.46 | 10.89 |

*Step 2*

**Velocity** 0.32 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics Mean | | - | - |
| 90%ile | | - | - |
| 95%ile | | - | - |
| 99%ile | | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment X

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.06 | 0.18 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.19 | 0.63 |
| | 90%ile | 0.47 | 1.17 |
| | 95%ile | 0.93 | 2.48 |
| | 99%ile | 2.70 | 11.82 |

*Step 2*

**Velocity** 0.26 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment Y

## Summary of predictions

| Prediction of impact | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| | *Step1* | | | | | | | | | | |
| | *Step2* | | | | | | | | | | |
| | *Step3* | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.1 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.10 | 0.30 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 0.31 | 1.02 |
| | 90%ile | 0.78 | 1.97 |
| | 95%ile | 1.55 | 4.01 |
| | 99%ile | 4.22 | 19.25 |

*Step 2*

**Velocity** 0.26 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment Z

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

| | | Step 1 Copper | Step 1 Zinc | Step 1 Copper | Step 1 Zinc | Step 1 Cadmium | Step 1 Total PAH | Step 1 Pyrene | Step 1 Fluoranthene | Step 1 Anthracene | Step 1 Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RST24 | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 81 | 64 | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | RST6 | | | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | | | | | | | | |
| **No. of exceedances/year** | | 18.00 | 20.60 | | | | | | | | |
| No. of exceedances/worst year | | 24 | 27 | | | | | | | | |
| | | (ug/l) | (ug/l) | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | RST24 | 21 | 60 | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Thresholds | RST6 | 42 | 120 | | | | | | | | |
| Event Statistics | Mean | 23.36 | 67.70 | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 45.65 | 147.58 | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 54.99 | 194.62 | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 96.36 | 372.28 | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

| | | Step 2 Copper | Step 2 Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 2.4 | 3 |
| No. of exceedances/worst year | | 6 | 6 |
| No. of exceedances/summer | | 1.3 | 1.4 |
| No. of exceedances/worst summer | | 3 | 6 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.3 | 1.3 |
| No. of exceedances/worst year | | 1 | 3 |
| No. of exceedances/summer | | 0 | 0.7 |
| No. of exceedances/worst summer | | 0 | 3 |
| Annual average concentration (ug/l) | | 1.00 | 3.06 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 2.65 | 7.88 |
| | 90%ile | 7.88 | 19.84 |
| | 95%ile | 12.68 | 36.63 |
| | 99%ile | 24.97 | 112.23 |

**Velocity** 0.03 m/s — Tier 1 is used for the calculation

**DI** 779.41

**% settlement needed** 88 %

### In River (with mitigation)

| | | Step 3 Copper | Step 3 Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.24 | 0.74 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.63 | 1.88 |
| | 90%ile | 1.88 | 4.76 |
| | 95%ile | 3.04 | 8.79 |
| | 99%ile | 5.99 | 26.33 |

**DI** 46.76

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Routine Runoff Results - DS (Cumulative Assessments)

## Drainage Catchments A, B & C

### Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | *Step1* | | | | | | | | | | |
| | *Step2* | | | | | | | | | | |
| | *Step3* | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **78.70** | **70.40** |
| No. of exceedances/worst year | | 97 | 81 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **27.80** | **29.80** |
| No. of exceedances/worst year | | 36 | 37 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 28.38 | 85.11 |
| | 90%ile | 55.48 | 185.53 |
| | 95%ile | 66.83 | 244.68 |
| | 99%ile | 117.11 | 468.03 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | | | | | | | |
| No. of exceedances/worst year | | | | | | | | |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.6** | **1.8** |
| No. of exceedances/worst year | | 1 | 5 |
| No. of exceedances/summer | | 0.3 | 1.1 |
| No. of exceedances/worst summer | | 1 | 5 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0** | **0.3** |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0.1 |
| No. of exceedances/worst summer | | 0 | 1 |
| Annual average concentration (ug/l) | | 0.46 | 1.45 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 1.32 | 4.27 |
| | 90%ile | 3.89 | 10.07 |
| | 95%ile | 7.04 | 18.59 |
| | 99%ile | 15.04 | 67.30 |

*Step 2*

**Velocity** m/s — Tier 1 is used for the calculation

**DI**

**% settlement needed** %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.00** | **0.30** |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0.1 |
| No. of exceedances/worst summer | | 0 | 1 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0.00** | **0.00** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.27 | 0.89 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 0.74 | 2.30 |
| | 90%ile | 2.20 | 5.54 |
| | 95%ile | 3.98 | 10.72 |
| | 99%ile | 7.91 | 34.33 |

**DI**

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchments B & C

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **78.70** | **70.40** |
| No. of exceedances/worst year | | 97 | 81 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **27.80** | **29.80** |
| No. of exceedances/worst year | | 36 | 37 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 28.38 | 85.11 |
| | 90%ile | 55.48 | 185.53 |
| | 95%ile | 66.83 | 244.68 |
| | 99%ile | 117.11 | 468.03 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | Toxicity Threshold | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **97.40** | **127.00** | **2.40** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 112 | 143 | 8 | 59 | 127 | 59 | 32 | 101 |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 398 | 1647 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 864 | 3634 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 1121 | 4759 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1592 | 7288 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.2** | **1.5** |
| No. of exceedances/worst year | | 1 | 4 |
| No. of exceedances/summer | | 0.1 | 0.9 |
| No. of exceedances/worst summer | | 1 | 4 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0** | **0.2** |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.38 | 1.21 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 1.12 | 3.66 |
| | 90%ile | 3.22 | 8.50 |
| | 95%ile | 6.01 | 15.66 |
| | 99%ile | 13.02 | 60.45 |

*Step 2*

**Velocity** 0.17 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.00** | **0.20** |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0.00** | **0.00** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.23 | 0.74 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 0.64 | 2.01 |
| | 90%ile | 1.88 | 4.84 |
| | 95%ile | 3.34 | 9.35 |
| | 99%ile | 7.38 | 31.67 |

**DI** -

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchments D & E

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

| | | Step 1 Copper | Step 1 Zinc | Step 1 Copper | Step 1 Zinc | Step 1 Cadmium | Step 1 Total PAH | Step 1 Pyrene | Step 1 Fluoranthene | Step 1 Anthracene | Step 1 Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RST24 | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 81 | 64 | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | RST6 | | | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | | | | | | | | |
| **No. of exceedances/year** | | 18.00 | 20.60 | | | | | | | | |
| No. of exceedances/worst year | | 24 | 27 | | | | | | | | |
| | | (ug/l) | (ug/l) | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | RST24 | 21 | 60 | Toxicity Threshold 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Thresholds | RST6 | 42 | 120 | | | | | | | | |
| Event Statistics | Mean | 23.36 | 67.70 | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 45.65 | 147.58 | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 54.99 | 194.62 | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 96.36 | 372.28 | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

| | | Step 2 Copper | Step 2 Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.6 |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0.4 |
| No. of exceedances/worst summer | | 0 | 2 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.23 | 0.69 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.68 | 2.15 |
| | 90%ile | 1.81 | 4.59 |
| | 95%ile | 3.68 | 8.84 |
| | 99%ile | 8.89 | 37.30 |

**Velocity** 0.05 m/s — Tier 1 is used for the calculation

**DI** 125.13

**% settlement needed** 21 %

### In River (with mitigation)

| | | Step 3 Copper | Step 3 Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.14 | 0.43 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.33 | 0.96 |
| | 90%ile | 0.93 | 2.26 |
| | 95%ile | 1.66 | 4.64 |
| | 99%ile | 3.50 | 12.02 |

**DI** 30.03

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchments H & I, Tier 1, Treatment Train 1

## Summary of predictions

**Soluble - Acute Impact**

| Prediction of impact | | Copper | Zinc |
|---|---|---|---|
| | Step1 | | |
| | Step2 | | |
| | Step3 | | |

**Sediment - Chronic Impact**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **1** | **2.1** |
| No. of exceedances/worst year | | 2 | 5 |
| No. of exceedances/summer | | 0.5 | 1.1 |
| No. of exceedances/worst summer | | 2 | 5 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0** | **0.5** |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0.2 |
| No. of exceedances/worst summer | | 0 | 2 |
| Annual average concentration (ug/l) | | 0.64 | 1.93 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 1.75 | 5.31 |
| | 90%ile | 5.24 | 12.82 |
| | 95%ile | 9.07 | 24.30 |
| | 99%ile | 17.63 | 73.73 |

**Step 2**

**Velocity** 0.02 m/s

Tier 1 is used for the calculation

**DI** 512.76

**% settlement needed** 81 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **0.10** | **0.30** |
| No. of exceedances/worst year | | 1 | 1 |
| No. of exceedances/summer | | 0 | 0.1 |
| No. of exceedances/worst summer | | 0 | 1 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.00** | **0.00** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.39 | 1.21 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.98 | 2.88 |
| | 90%ile | 2.92 | 7.24 |
| | 95%ile | 4.92 | 14.21 |
| | 99%ile | 10.19 | 38.02 |

**DI** 123.06

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchments H & I, Tier 2, Treatment Train 1

## Summary of predictions

**Soluble - Acute Impact**

| Prediction of impact | | Copper | Zinc |
|---|---|---|---|
| | *Step1* | | |
| | *Step2* | | |
| | *Step3* | | |

**Sediment - Chronic Impact**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **1** | **2.1** |
| No. of exceedances/worst year | | 2 | 5 |
| No. of exceedances/summer | | 0.5 | 1.1 |
| No. of exceedances/worst summer | | 2 | 5 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0** | **0.5** |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0.2 |
| No. of exceedances/worst summer | | 0 | 2 |
| Annual average concentration (ug/l) | | 0.64 | 1.93 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 1.75 | 5.31 |
| | 90%ile | 5.24 | 12.82 |
| | 95%ile | 9.07 | 24.30 |
| | 99%ile | 17.63 | 73.73 |

*Step 2*

**Velocity** 0.21 m/s — Tier 2 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **0.10** | **0.30** |
| No. of exceedances/worst year | | 1 | 1 |
| No. of exceedances/summer | | 0 | 0.1 |
| No. of exceedances/worst summer | | 0 | 1 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.00** | **0.00** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.39 | 1.21 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 0.98 | 2.88 |
| | 90%ile | 2.92 | 7.24 |
| | 95%ile | 4.92 | 14.21 |
| | 99%ile | 10.19 | 38.02 |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchments J & K

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | Toxicity Threshold | | | | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | | | | | |
| | | | | | | | | |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| *Toxicity Threshold* | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **1.7** | **2.6** |
| No. of exceedances/worst year | | 3 | 5 |
| No. of exceedances/summer | | 1 | 1.3 |
| No. of exceedances/worst summer | | 3 | 5 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.2** | **0.8** |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0 | 0.4 |
| No. of exceedances/worst summer | | 0 | 2 |
| Annual average concentration (ug/l) | | 0.87 | 2.54 |
| | | (ug/l) | (ug/l) |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 2.23 | 6.73 |
| | 90%ile | 6.85 | 17.03 |
| | 95%ile | 11.21 | 30.52 |
| | 99%ile | 21.21 | 93.75 |

*Step 2*

**Velocity** m/s

**DI**

**% settlement needed** %

Tier 1 is used for the calculation

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **0.30** | **0.50** |
| No. of exceedances/worst year | | 1 | 3 |
| No. of exceedances/summer | | 0 | 0.1 |
| No. of exceedances/worst summer | | 0 | 1 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0.00** | **0.10** |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.52 | 1.67 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 1.20 | 3.48 |
| | 90%ile | 3.55 | 8.98 |
| | 95%ile | 5.35 | 16.71 |
| | 99%ile | 11.09 | 38.66 |

*Step 3*

**DI**

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchments L, V & M

## Summary of predictions

| Prediction of impact | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Step1 | | | | | | | | | | |
| Step2 | | | | | | | | | | |
| Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | Copper | Zinc |
|---|---|---|
| RST24 | | |
| Allowable Exceedances/year | 1 | 1 |
| No. of exceedances/year | 63.00 | 56.70 |
| No. of exceedances/worst year | 81 | 64 |
| RST6 | | |
| Allowable Exceedances/year | 1 | 1 |
| No. of exceedances/year | 18.00 | 20.60 |
| No. of exceedances/worst year | 24 | 27 |
| | (ug/l) | (ug/l) |
| Thresholds RST24 | 21 | 60 |
| Thresholds RST6 | 42 | 120 |
| Event Statistics Mean | 23.36 | 67.70 |
| 90%ile | 45.65 | 147.58 |
| 95%ile | 54.99 | 194.62 |
| 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| Toxicity Threshold | | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| No. of exceedances/year | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | Copper | Zinc |
|---|---|---|
| RST24 | | |
| Allowable Exceedances/year | 2 | 2 |
| No. of exceedances/year | 1.2 | 2.2 |
| No. of exceedances/worst year | 3 | 5 |
| No. of exceedances/summer | 0.6 | 1.2 |
| No. of exceedances/worst summer | 3 | 5 |
| RST6 | | |
| Allowable Exceedances/year | 1 | 1 |
| No. of exceedances/year | 0 | 0.6 |
| No. of exceedances/worst year | 0 | 2 |
| No. of exceedances/summer | 0 | 0.3 |
| No. of exceedances/worst summer | 0 | 2 |
| Annual average concentration (ug/l) | 0.75 | 2.07 |
| | (ug/l) | (ug/l) |
| Thresholds RST24 | 21 | 60 |
| Thresholds RST6 | 42 | 120 |
| Event Statistics Mean | 1.86 | 5.65 |
| 90%ile | 5.62 | 13.82 |
| 95%ile | 9.65 | 26.06 |
| 99%ile | 18.65 | 78.47 |

**Step 2**

Velocity 0.39 m/s — Tier 1 is used for the calculation

DI -

% settlement needed - %

### In River (with mitigation)

**Step 3**

| | Copper | Zinc |
|---|---|---|
| RST24 | | |
| Allowable Exceedances/year | 2 | 2 |
| No. of exceedances/year | 0.10 | 0.20 |
| No. of exceedances/worst year | 1 | 1 |
| No. of exceedances/summer | 0 | 0 |
| No. of exceedances/worst summer | 0 | 0 |
| RST6 | | |
| Allowable Exceedances/year | 1 | 1 |
| No. of exceedances/year | 0.00 | 0.00 |
| No. of exceedances/worst year | 0 | 0 |
| No. of exceedances/summer | 0 | 0 |
| No. of exceedances/worst summer | 0 | 0 |
| Annual average concentration (ug/l) | 0.45 | 1.46 |
| | (ug/l) | (ug/l) |
| Thresholds hresholds RST24 | 21 | 60 |
| Thresholds RST6 | 42 | 120 |
| Event Statistics Mean | 0.85 | 2.39 |
| 90%ile | 2.38 | 6.36 |
| 95%ile | 3.86 | 11.40 |
| 99%ile | 7.57 | 26.43 |

DI -

| Details of the chosen rainfall site | |
|---|---|
| SAAR (mm) | 1343.9 |
| Altitude (m) | 130 |
| Easting | 2704 |
| Northing | 7389 |
| Coastal distance (km) | 58 |

# Drainage Catchments P & Q, Tier 1, Treatment Train 1

## Summary of predictions

| Prediction of impact | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 2.1 | 2.9 |
| No. of exceedances/worst year | | 5 | 6 |
| No. of exceedances/summer | | 1.1 | 1.4 |
| No. of exceedances/worst summer | | 3 | 6 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.3 | 0.9 |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0 | 0.4 |
| No. of exceedances/worst summer | | 0 | 2 |
| Annual average concentration (ug/l) | | 1.16 | 2.89 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 2.51 | 7.49 |
| | 90%ile | 7.42 | 18.99 |
| | 95%ile | 12.18 | 34.15 |
| | 99%ile | 23.65 | 105.58 |

**Step 2**

**Velocity** 0.06 m/s — Tier 1 is used for the calculation

**DI** 429.57

**% settlement needed** 77 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.20 | 0.30 |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.70 | 2.29 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 1.00 | 2.77 |
| | 90%ile | 2.85 | 7.49 |
| | 95%ile | 4.35 | 12.34 |
| | 99%ile | 9.13 | 28.60 |

**DI** 103.10

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchments P & Q, Tier 2, Treatment Train 1

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RST24 | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 81 | 64 | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | RST6 | | | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | | | | | | | | |
| **No. of exceedances/year** | | 18.00 | 20.60 | | | | | | | | |
| No. of exceedances/worst year | | 24 | 27 | | | | | | | | |
| | | (ug/l) | (ug/l) | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | RST24 | 21 | 60 | Toxicity Threshold 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Thresholds | RST6 | 42 | 120 | | | | | | | | |
| Event Statistics | Mean | 23.36 | 67.70 | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 45.65 | 147.58 | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 54.99 | 194.62 | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 96.36 | 372.28 | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 2.1 | 2.9 |
| No. of exceedances/worst year | | 5 | 6 |
| No. of exceedances/summer | | 1.1 | 1.4 |
| No. of exceedances/worst summer | | 3 | 6 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.3 | 0.9 |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0 | 0.4 |
| No. of exceedances/worst summer | | 0 | 2 |
| Annual average concentration (ug/l) | | 1.16 | 2.89 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 2.51 | 7.49 |
| | 90%ile | 7.42 | 18.99 |
| | 95%ile | 12.18 | 34.15 |
| | 99%ile | 23.65 | 105.58 |

**Step 2**

**Velocity** 0.39 m/s — Tier 2 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.20 | 0.30 |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.70 | 2.29 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 1.00 | 2.77 |
| | 90%ile | 2.85 | 7.49 |
| | 95%ile | 4.35 | 12.34 |
| | 99%ile | 9.13 | 28.60 |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchments T & U

## Summary of predictions

| Prediction of impact | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| | *Step1* | | | | | | | | | | |
| | *Step2* | | | | | | | | | | |
| | *Step3* | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

| | | *Step 1* Copper | *Step 1* Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RST24 | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 81 | 64 | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | RST6 | | | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | | | | | | | | |
| **No. of exceedances/year** | | 18.00 | 20.60 | | | | | | | | |
| No. of exceedances/worst year | | 24 | 27 | | | | | | | | |
| | | *(ug/l)* | *(ug/l)* | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| Thresholds | *RST24* | 21 | 60 | *Toxicity Threshold* 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Thresholds | *RST6* | 42 | 120 | | | | | | | | |
| Event Statistics | Mean | 23.36 | 67.70 | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 45.65 | 147.58 | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 54.99 | 194.62 | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 96.36 | 372.28 | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

| | | *Step 2* Copper | *Step 2* Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 4.3 | 4.5 |
| No. of exceedances/worst year | | 8 | 10 |
| No. of exceedances/summer | | 2.3 | 2 |
| No. of exceedances/worst summer | | 7 | 9 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0.5 | 1.6 |
| No. of exceedances/worst year | | 2 | 4 |
| No. of exceedances/summer | | 0.1 | 0.8 |
| No. of exceedances/worst summer | | 1 | 4 |
| Annual average concentration (ug/l) | | 1.55 | 4.16 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 3.46 | 10.27 |
| | 90%ile | 10.22 | 26.47 |
| | 95%ile | 15.75 | 46.76 |
| | 99%ile | 29.39 | 122.35 |

**Velocity** 0.08 m/s — Tier 1 is used for the calculation

**DI** 447.50

**% settlement needed** 78 %

### In River (with mitigation)

| | | *Step 3* Copper | *Step 3* Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0.00 | 0.00 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.37 | 1.22 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | *RST24* | 21 | 60 |
| Thresholds | *RST6* | 42 | 120 |
| Event Statistics | Mean | 0.71 | 2.02 |
| | 90%ile | 2.09 | 5.25 |
| | 95%ile | 3.16 | 8.82 |
| | 99%ile | 6.24 | 21.27 |

**DI** 26.85

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchments X & Y

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | *Step1* | | | | | | | | | | |
| | *Step2* | | | | | | | | | | |
| | *Step3* | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.2 |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.15 | 0.46 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 0.46 | 1.50 |
| | 90%ile | 1.20 | 3.02 |
| | 95%ile | 2.41 | 6.01 |
| | 99%ile | 6.07 | 28.33 |

*Step 2*

**Velocity** 0.26 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# 4 Accidental Spillage Risk Assessment – Calculation Tables

## Spillage Risk Results

### Drainage Catchment A

| 2036 Do Something Catchment A | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road within 100m of roundabout | 0.08 | 3.09 | 57,250 | 5.5 | 0.00028410396 | 0.45 | 0.000127847 | 7822 | 0.013 |
| Road no junction | 0.09 | 0.29 | 57,250 | 5.5 | 0.00002999641 | 0.45 | 1.34984E-05 | 74083 | 0.001 |
| Road within 100m of slip road | 0.1 | 0.83 | 57,250 | 5.5 | 0.00009539089 | 0.45 | 4.29259E-05 | 23296 | 0.004 |
| Road within 100m of slip road | 0.1 | 0.83 | 32,316 | 7.5 | 0.00007342602 | 0.45 | 3.30417E-05 | 30265 | 0.003 |
| Road no junction | 0.04 | 0.29 | 32,316 | 7.5 | 0.00001026195 | 0.45 | 4.61788E-06 | 216550 | 0.000 |
| | **Total for Catchment A** | | | | 0.00049317924 | 0.45 | 0.000221931 | 4506 | 0.022 |

### Drainage Catchment B

| 2036 Do Something Catchment B | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.51 | 0.29 | 32,316 | 7.5 | 0.00013083987 | 0.45 | 5.88779E-05 | 16984 | 0.006 |
| | **Total for Catchment B** | | | | 0.00013083987 | 0.45 | 5.88779E-05 | 16984 | 0.006 |

### Drainage Catchment C

| 2036 Do Something Catchment C | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Slip road | 0.46 | 0.83 | 11,206 | 2.6 | 0.00004060218 | 0.45 | 1.8271E-05 | 54732 | 0.002 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 11,206 | 2.6 | 0.00003286033 | 0.45 | 1.47871E-05 | 67626 | 0.001 |
| Roundabout | 0.2 | 3.09 | 12,551 | 2.6 | 0.00007360936 | 0.45 | 3.31242E-05 | 30189 | 0.003 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 1,345 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road | 0.61 | 0.83 | 1,345 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Side road within 100m of roundabout | 0.1 | 3.09 | 1,849 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road | 3.5 | 0.83 | 13,392 | 1.9 | 0.00026979607 | 0.45 | 0.000121408 | 8237 | 0.012 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 13,392 | 1.9 | 0.00002869776 | 0.45 | 1.2914E-05 | 77435 | 0.001 |
| Roundabout | 0.2 | 3.09 | 14,821 | 1.9 | 0.00006352029 | 0.45 | 2.85841E-05 | 34984 | 0.003 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 1,429 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road | 0.48 | 0.83 | 1,429 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| | **Total for Catchment C** | | | | 0.00050908597 | 0.45 | 0.000229089 | 4365 | 0.023 |

Cumulative annual probability from catchments A, B and C = 0.051%

### Drainage Catchment D

| 2036 Do Something Catchment D | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.21 | 0.29 | 32,316 | 7.5 | 0.00005387524 | 0.45 | 2.42439E-05 | 41248 | 0.002 |
| Road within 100m of slip road | 0.1 | 0.83 | 32,316 | 7.5 | 0.00007342602 | 0.45 | 3.30417E-05 | 30265 | 0.003 |
| Road within 100m of slip road | 0.1 | 0.83 | 35,084 | 6.9 | 0.00007333883 | 0.45 | 3.30025E-05 | 30301 | 0.003 |
| Road no junction | 0.13 | 0.29 | 35,084 | 6.9 | 0.00003331173 | 0.45 | 1.49903E-05 | 66710 | 0.001 |
| | **Total for Catchment D** | | | | 0.00023395183 | 0.45 | 0.000105278 | 9499 | 0.011 |

### Drainage Catchment E

| 2036 Do Something Catchment E | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.52 | 0.29 | 35,084 | 6.9 | 0.00013324694 | 0.45 | 5.99611E-05 | 16677 | 0.006 |
| | **Total for Catchment E** | | | | 0.00013324694 | 0.45 | 5.99611E-05 | 16677 | 0.006 |

Cumulative annual probability from catchments D and E = 0.017%

### Drainage Catchment F

| 2036 Do Something Catchment F | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 1.46 | 0.29 | 35,084 | 6.9 | 0.00037411640 | 0.45 | 0.000168352 | 5940 | 0.017 |
| Road within 100m of slip road | 0.1 | 0.83 | 35,084 | 6.9 | 0.00007333883 | 0.45 | 3.30025E-05 | 30301 | 0.003 |
| Road within 100m of slip road | 0.1 | 0.83 | 22,336 | 6.2 | 0.00004195403 | 0.45 | 1.88793E-05 | 52968 | 0.002 |
| Road no junction | 0.52 | 0.29 | 22,336 | 6.2 | 0.00007622492 | 0.45 | 3.43012E-05 | 29153 | 0.003 |
| | **Total for Catchment F** | | | | 0.00056563418 | 0.45 | 0.000254535 | 3929 | 0.025 |

**Drainage Catchment G**

| 2036 Do Something Catchment G | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Slip road | 0.52 | 0.83 | 6,544 | 8.2 | 0.00008452885 | 0.45 | 3.8038E-05 | 26290 | 0.004 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 6,544 | 8.2 | 0.00006051764 | 0.45 | 2.72329E-05 | 36720 | 0.003 |
| Roundabout | 0.2 | 3.09 | 8199 | 8.2 | 0.00015165477 | 0.45 | 6.82446E-05 | 14653 | 0.007 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 1,656 | 0.2 | 0.00000037345 | 0.45 | 1.68054E-07 | 5950455 | 0.000 |
| Slip road | 0.65 | 0.83 | 1,656 | 0.2 | 0.00000065203 | 0.45 | 2.93415E-07 | 3408138 | 0.000 |
| Side road within 100m of roundabout | 0.09 | 3.09 | 6,994 | 5.4 | 0.00003833598 | 0.45 | 1.72512E-05 | 57967 | 0.002 |
| Roundabout | 0.2 | 3.09 | 7,310 | 5.5 | 0.00009069042 | 0.45 | 4.08107E-05 | 24503 | 0.004 |
| Slip road | 0.49 | 0.83 | 6,208 | 5.5 | 0.00005068491 | 0.45 | 2.28082E-05 | 43844 | 0.002 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 6,208 | 5.5 | 0.00003850907 | 0.45 | 1.73291E-05 | 57706 | 0.002 |
| Side road within 100m of roundabout | 0.1 | 3.09 | 3,724 | 1.2 | 0.00000504032 | 0.45 | 2.26814E-06 | 440889 | 0.000 |
| Side road | 0.06 | 0.93 | 3,724 | 1.2 | 0.00000091019 | 0.45 | 4.09587E-07 | 2441484 | 0.000 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 1,102 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road | 0.57 | 0.83 | 1,102 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| | **Total for Catchment G** | | | | 0.00052189764 | 0.45 | 0.000234854 | 4258 | 0.023 |

**Drainage Catchment H**

| 2036 Do Something Catchment H | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.48 | 0.29 | 22,336 | 6.2 | 0.00007036146 | 0.45 | 3.16627E-05 | 31583 | 0.003 |
| Road within 100m of slip road | 0.1 | 0.83 | 22,336 | 6.2 | 0.00004195403 | 0.45 | 1.88793E-05 | 52968 | 0.002 |
| Road within 100m of slip road | 0.1 | 0.83 | 25,084 | 5.4 | 0.00004103596 | 0.45 | 1.84662E-05 | 54153 | 0.002 |
| Road no junction | 0.49 | 0.29 | 25,084 | 5.4 | 0.00007025554 | 0.45 | 3.1615E-05 | 31631 | 0.003 |
| | **Total for Catchment H** | | | | 0.00022360698 | 0.45 | 0.000100623 | 9938 | 0.010 |

**Drainage Catchment I**

| 2036 Do Something Catchment I | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 1.33 | 0.29 | 25,084 | 5.4 | 0.00019069360 | 0.45 | 8.58121E-05 | 11653 | 0.009 |
| | **Total for Catchment I** | | | | 0.00019069360 | 0.45 | 8.58121E-05 | 11653 | 0.009 |

Cumulative annual probability from catchments H and I = 0.019

**Drainage Catchment J**

| 2036 Do Something Catchment J | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.92 | 0.29 | 25,084 | 5.4 | 0.00013190835 | 0.45 | 5.93588E-05 | 16847 | 0.006 |
| | **Total for Catchment J** | | | | 0.00013190835 | 0.45 | 5.93588E-05 | 16847 | 0.006 |

**Drainage Catchment K**

| 2036 Do Something Catchment K | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.83 | 0.29 | 25,084 | 5.4 | 0.00011900427 | 0.45 | 5.35519E-05 | 18673 | 0.005 |
| | **Total for Catchment K** | | | | 0.00011900427 | 0.45 | 5.35519E-05 | 18673 | 0.005 |

Cumulative annual probability from catchments J and K = 0.011%

**Drainage Catchment L**

| 2036 Do Something Catchment L | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.55 | 0.29 | 25,084 | 5.4 | 0.00007885825 | 0.45 | 3.54862E-05 | 28180 | 0.004 |
| Road within 100m of slip road | 0.1 | 0.83 | 25,084 | 5.4 | 0.00004103596 | 0.45 | 1.84662E-05 | 54153 | 0.002 |
| Road within 100m of slip road | 0.1 | 0.83 | 24,383 | 5.6 | 0.00004136642 | 0.45 | 1.86149E-05 | 53720 | 0.002 |
| | **Total for Catchment L** | | | | 0.00016126063 | 0.45 | 7.25673E-05 | 13780 | 0.007 |

**Drainage Catchment V**

| 2036 Do Something Catchment V | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.77 | 0.29 | 24,383 | 5.6 | 0.00011129062 | 0.45 | 5.00808E-05 | 19968 | 0.005 |
| Road within 100m of slip road | 0.1 | 0.83 | 24,383 | 5.6 | 0.00004136642 | 0.45 | 1.86149E-05 | 53720 | 0.002 |
| Slip road | 0.45 | 0.83 | 481 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 481 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Roundabout | 0.14 | 3.09 | 1,193 | 1.6 | 0.00000301398 | 0.45 | 1.35629E-06 | 737306 | 0.000 |
| Side road within 100m of roundabout | 0.16 | 3.09 | 333 | 8.7 | 0.00000523198 | 0.45 | 2.35439E-06 | 424738 | 0.000 |
| Roundabout | 0.14 | 3.09 | 833 | 1.2 | 0.00000157836 | 0.45 | 7.10261E-07 | 1407933 | 0.000 |
| Slip road | 0.55 | 0.83 | 217 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 217 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| | **Total for Catchment V** | | | | 0.00016248136 | 0.45 | 7.31166E-05 | 13677 | 0.007 |

**Drainage Catchment M**

| 2036 Do Something Catchment M | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road within 100m of slip road | 0.1 | 0.83 | 25,718 | 5.4 | 0.00004207305 | 0.45 | 1.89329E-05 | 52818 | 0.002 |
| Road no junction | 1.8 | 0.29 | 25,718 | 5.4 | 0.00026460401 | 0.45 | 0.000119072 | 8398 | 0.012 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 712 | 1.6 | 0.00000128496 | 0.45 | 5.78234E-07 | 1729404 | 0.000 |
| Slip road | 0.5 | 0.83 | 712 | 1.6 | 0.00000172576 | 0.45 | 7.76592E-07 | 1287677 | 0.000 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 616 | 1.2 | 0.00000083371 | 0.45 | 3.75168E-07 | 2665472 | 0.000 |
| Slip road | 0.51 | 0.83 | 616 | 1.2 | 0.00000114210 | 0.45 | 5.13944E-07 | 1945738 | 0.000 |
| | **Total for Catchment M** | | | | 0.00031166359 | 0.45 | 0.000140249 | 7130 | 0.014 |

Cumulative annual probability from catchments L, V and M = 0.029%

**Drainage Catchment N**

| 2036 Do Something Catchment N | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.68 | 0.29 | 25,718 | 5.4 | 0.00009996152 | 0.45 | 4.49827E-05 | 22231 | 0.004 |
| Road within 100m of slip road | 0.1 | 0.83 | 25,718 | 5.4 | 0.00004207305 | 0.45 | 1.89329E-05 | 52818 | 0.002 |
| Road within 100m of slip road | 0.1 | 0.83 | 23,813 | 5.8 | 0.00004184226 | 0.45 | 1.8829E-05 | 53110 | 0.002 |
| Road no junction | 0.48 | 0.29 | 23,813 | 5.8 | 0.00007017401 | 0.45 | 3.15783E-05 | 31667 | 0.003 |
| Road within 100m of slip road | 0.1 | 0.83 | 23,813 | 5.8 | 0.00004184226 | 0.45 | 1.8829E-05 | 53110 | 0.002 |
| Road within 100m of slip road | 0.1 | 0.83 | 26,656 | 5.4 | 0.00004360750 | 0.45 | 1.96234E-05 | 50960 | 0.002 |
| Road no junction | 0.39 | 0.29 | 26,656 | 5.4 | 0.00005942179 | 0.45 | 2.67398E-05 | 37397 | 0.003 |
| Slip road | 0.41 | 0.83 | 863 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road within 100m of side road | 0.1 | 0.93 | 863 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Side road | 0.3 | 0.93 | 1,683 | 4.0 | 0.00000685351 | 0.45 | 3.08408E-06 | 324246 | 0.000 |
| Slip road within 100m of side road | 0.1 | 0.93 | 1,541 | 1.8 | 0.00000094157 | 0.45 | 4.23705E-07 | 2360133 | 0.000 |
| Slip road | 0.54 | 0.83 | 1,541 | 1.8 | 0.00000453774 | 0.45 | 2.04198E-06 | 489720 | 0.000 |
| Slip road | 0.53 | 0.83 | 1,035 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road within 100m of side road | 0.1 | 0.93 | 1,035 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road within 100m of side road | 0.1 | 0.93 | 1,297 | 2.5 | 0.00000110107 | 0.45 | 4.9548E-07 | 2018243 | 0.000 |
| Slip road | 0.42 | 0.83 | 1,297 | 2.5 | 0.00000412723 | 0.45 | 1.85725E-06 | 538430 | 0.000 |
| | **Total for Catchment N** | | | | 0.00041648349 | 0.45 | 0.000187418 | 5336 | 0.019 |

**Drainage Catchment O**

| 2036 Do Something Catchment O | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 1.45 | 0.29 | 26,656 | 5.4 | 0.00022092715 | 0.45 | 9.94172E-05 | 10059 | 0.010 |
| | **Total for Catchment O** | | | | 0.00022092715 | 0.45 | 9.94172E-05 | 10059 | 0.010 |

**Drainage Catchment P**

| 2036 Do Something Catchment P | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.7 | 0.29 | 26,656 | 5.4 | 0.00010665449 | 0.45 | 4.79945E-05 | 20836 | 0.005 |
| | **Total for Catchment P** | | | | 0.00010665449 | 0.45 | 4.79945E-05 | 20836 | 0.005 |

**Drainage Catchment Q**

| 2036 Do Something Catchment Q | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.37 | 0.29 | 26,656 | 5.4 | 0.00005637451 | 0.45 | 2.53685E-05 | 39419 | 0.003 |
| Road within 100m of slip road | 0.1 | 0.83 | 26,656 | 5.4 | 0.00004360750 | 0.45 | 1.96234E-05 | 50960 | 0.002 |
| Road within 100m of slip road | 0.1 | 0.83 | 15,756 | 6.5 | 0.00003102568 | 0.45 | 1.39616E-05 | 71625 | 0.001 |
| Road no junction | 0.39 | 0.29 | 15,756 | 6.5 | 0.00004227716 | 0.45 | 1.90247E-05 | 52563 | 0.002 |
| Road within 100m of slip road | 0.1 | 0.83 | 15,756 | 6.5 | 0.00003102568 | 0.45 | 1.39616E-05 | 71625 | 0.001 |
| Road within 100m of slip road | 0.1 | 0.83 | 15,939 | 6.4 | 0.00003090371 | 0.45 | 1.39067E-05 | 71908 | 0.001 |
| Road no junction | 1.1 | 0.29 | 15,939 | 6.4 | 0.00011877451 | 0.45 | 5.34485E-05 | 18710 | 0.005 |
| Slip road | 0.43 | 0.83 | 5,394 | 5.7 | 0.00004004909 | 0.45 | 1.80221E-05 | 55487 | 0.002 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 5,394 | 5.7 | 0.00003467405 | 0.45 | 1.56033E-05 | 64089 | 0.002 |
| Roundabout | 0.16 | 3.09 | 5,447 | 5.7 | 0.00005602780 | 0.45 | 2.52125E-05 | 39663 | 0.003 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 53 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road | 0.5 | 0.83 | 53 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road | 0.81 | 0.83 | 5,505 | 1.8 | 0.00002431737 | 0.45 | 1.09428E-05 | 91384 | 0.001 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 5,505 | 1.8 | 0.00001117666 | 0.45 | 5.0295E-06 | 198827 | 0.001 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 138 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| Slip road | 0.68 | 0.83 | 138 | 0.0 | 0.00000000000 | 0.45 | 0 | 0 | 0.000 |
| | **Total for Catchment Q** | | | | 0.00052023372 | 0.45 | 0.000234105 | 4272 | 0.023 |

Cumulative annual probability from catchments P and Q = 0.028%

**Drainage Catchment R**

| 2036 Do Something Catchment R | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 1.27 | 0.29 | 15,939 | 6.4 | 0.00013713058 | 0.45 | 6.17088E-05 | 16205 | 0.006 |
| Side road | 0.93 | 0.93 | 237 | 4.9 | 0.00000366116 | 0.45 | 1.64752E-06 | 606973 | 0.000 |
| | **Total for Catchment R** | | | | 0.00014079173 | 0.45 | 6.33563E-05 | 15784 | 0.006 |

**Drainage Catchment S**

| 2036 Do Something Catchment S | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 1.88 | 0.29 | 15,939 | 6.4 | 0.00020299644 | 0.45 | 9.13484E-05 | 10947 | 0.009 |
| | **Total for Catchment S** | | | | 0.00020299644 | 0.45 | 9.13484E-05 | 10947 | 0.009 |

**Drainage Catchment T**

| 2036 Do Something Catchment T | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 1.03 | 0.29 | 15,939 | 6.4 | 0.00011121614 | 0.45 | 5.00473E-05 | 19981 | 0.005 |
| | **Total for Catchment T** | | | | 0.00011121614 | 0.45 | 5.00473E-05 | 19981 | 0.005 |

**Drainage Catchment U**

| 2036 Do Something Catchment U | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 1.31 | 0.29 | 15,939 | 6.4 | 0.00014144965 | 0.45 | 6.36523E-05 | 15710 | 0.006 |
| Road no junction | 0.48 | 0.29 | 15,939 | 6.4 | 0.00005182888 | 0.45 | 2.3323E-05 | 42876 | 0.002 |
| Road within 100m of slip road | 0.1 | 0.83 | 15,939 | 6.4 | 0.00003090371 | 0.45 | 1.39067E-05 | 71908 | 0.001 |
| Road within 100m of slip road | 0.1 | 0.83 | 11,212 | 8.7 | 0.00002955228 | 0.45 | 1.32985E-05 | 75196 | 0.001 |
| Road no junction | 0.54 | 0.29 | 11,212 | 8.7 | 0.00005575768 | 0.45 | 2.5091E-05 | 39855 | 0.003 |
| | **Total for Catchment U** | | | | 0.00030949220 | 0.45 | 0.000139271 | 7180 | 0.014 |

Cumulative annual probability from catchments T and U = 0.019%

**Drainage Catchment W**

| 2036 Do Something Catchment W | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Slip road | 0.5 | 0.83 | 2,679 | 0.1 | 0.00000040579 | 0.45 | 1.82607E-07 | 5476239 | 0.000 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 2,679 | 0.1 | 0.00000030215 | 0.45 | 1.35965E-07 | 7354819 | 0.000 |
| Roundabout | 0.17 | 3.09 | 4,770 | 0.9 | 0.00000823116 | 0.45 | 3.70402E-06 | 269977 | 0.000 |
| Slip road within 100m of roundabout | 0.47 | 3.09 | 2,091 | 0.9 | 0.00000997604 | 0.45 | 4.48922E-06 | 222756 | 0.000 |
| Slip road | 0.1 | 0.83 | 2,091 | 0.9 | 0.00000057014 | 0.45 | 2.56562E-07 | 3897694 | 0.000 |
| Side road within 100m of roundabout | 0.21 | 3.09 | 2,017 | 0.7 | 0.00000334467 | 0.45 | 1.5051E-06 | 664407 | 0.000 |
| Slip road | 0.54 | 0.83 | 2,055 | 0.2 | 0.00000067247 | 0.45 | 3.02612E-07 | 3304565 | 0.000 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 2,055 | 0.2 | 0.00000046362 | 0.45 | 2.08628E-07 | 4793223 | 0.000 |
| Roundabout | 0.17 | 3.09 | 4,137 | 0.2 | 0.00000158641 | 0.45 | 7.13885E-07 | 1400786 | 0.000 |
| Slip road within 100m of roundabout | 0.1 | 3.09 | 2,082 | 0.2 | 0.00000046965 | 0.45 | 2.11341E-07 | 4731682 | 0.000 |
| Slip road | 0.13 | 0.83 | 2,082 | 0.2 | 0.00000016400 | 0.45 | 7.37985E-08 | 13550415 | 0.000 |
| | **Total for Catchment W** | | | | 0.00002618609 | 0.45 | 1.17837E-05 | 84863 | 0.001 |

**Drainage Catchment X**

| 2036 Do Something Catchment X | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 0.23 | 0.29 | 11,212 | 8.7 | 0.00002374864 | 0.45 | 1.06869E-05 | 93573 | 0.001 |
| Road within 100m of slip road | 0.1 | 0.83 | 11,212 | 8.7 | 0.00002955228 | 0.45 | 1.32985E-05 | 75196 | 0.001 |
| Road within 100m of slip road | 0.1 | 0.83 | 15,377 | 6.4 | 0.00002981508 | 0.45 | 1.34168E-05 | 74533 | 0.001 |
| Road no junction | 0.36 | 0.29 | 15,377 | 6.4 | 0.00003750234 | 0.45 | 1.68761E-05 | 59256 | 0.002 |
| Slip road | 0.29 | 0.83 | 2,082 | 0.2 | 0.00000036584 | 0.45 | 1.64627E-07 | 6074324 | 0.000 |
| | **Total for Catchment X** | | | | 0.00012098419 | 0.45 | 5.44429E-05 | 18368 | 0.005 |

**Drainage Catchment Y**

| 2036 Do Something Catchment Y | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 1.44 | 0.29 | 15,377 | 6.4 | 0.00015000937 | 0.45 | 6.75042E-05 | 14814 | 0.007 |
| | **Total for Catchment Y** | | | | 0.00015000937 | 0.45 | 6.75042E-05 | 14814 | 0.007 |

Cumulative annual probability from catchments W, X and Y = 0.013%

**Drainage Catchment Z**

| 2036 Do Something Catchment Z | Total Annual Accident Probability (Pacc) | | | | | Annual Pollution Incident Probability (Pinc) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Road Length (km) | Serious Spillage Risk Factor | Two-way AADT | %HGV | Annual Probability (Pacc) | Probability Factor (Ppol) | Probability | Return Period (years) | Percentage Probability (%) |
| Road no junction | 2.6 | 0.29 | 15,377 | 6.4 | 0.00027085026 | 0.45 | 0.000121883 | 8205 | 0.012 |
| | **Total for Catchment Z** | | | | 0.00027085026 | 0.45 | 0.000121883 | 8205 | 0.012 |

# 5 Routine Runoff Assessment (Do Minimum) – HAWRAT Output Sheets (User Parameters and Results)

## Routine Runoff Parameters (Individual Assessments)

### Drainage Catchment 1

| | | | | |
|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 02 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 10/07/2016 |
| **Outfall number** | 1 | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 1 | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.011*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***0.3*** | |
| Permeable area draining to outfall | ha | 1 | ***0.04*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.7*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

### Drainage Catchment 2

| | | | | |
|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 03 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 10/07/2016 |
| **Outfall number** | 2 | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 2 | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.011*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***0.99*** | |
| Permeable area draining to outfall | ha | 1 | ***0.12*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1.5*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment 3

| | | | | |
|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 06 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 10/07/2016 |
| **Outfall number** | 3 | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 3 | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.01*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***1.06*** | |
| Permeable area draining to outfall | ha | 1 | ***0.13*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1.2*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment 5

| | | | | |
|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 08 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | 10/07/2016 |
| **Outfall number** | 5 | | **Version of assessment** | 1 |
| **List of outfalls in cumulative assessment** | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 5 | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.003*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***0.66*** | |
| Permeable area draining to outfall | ha | 1 | ***0.08*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.4*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment 6

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Non-cumulative assessment (single outfall) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 09 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 10/07/2016 | |
| **Outfall number** | 6 | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 6 | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.006*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***1.75*** | |
| Permeable area draining to outfall | ha | 1 | ***0.22*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***2*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment 9

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Non-cumulative assessment (single outfall) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 13 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 10/07/2016 | |
| **Outfall number** | 9 | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 9 | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.002*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***1.01*** | |
| Permeable area draining to outfall | ha | 1 | ***0.12*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.7*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment 10

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Non-cumulative assessment (single outfall) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 14 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 10/07/2016 | |
| **Outfall number** | 10 | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 10 | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.002*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***0.52*** | |
| Permeable area draining to outfall | ha | 1 | ***0.06*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment 12

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Non-cumulative assessment (single outfall) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 16 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 10/07/2016 | |
| **Outfall number** | 12 | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 12 | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.008*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***1.09*** | |
| Permeable area draining to outfall | ha | 1 | ***0.13*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.4*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment 13

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | | SWF 18 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | | 10/07/2016 |
| **Outfall number** | 13 | | **Version of assessment** | | 1 |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 13 | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.002*** | | |
| Baseflow Index | - | 0.5 | ***0.5*** | | |
| Impermeable road area drained | ha | 1 | ***1.63*** | | |
| Permeable area draining to outfall | ha | 1 | ***0.2*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1.2*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***7*** | ***description for proposed measures*** | Filter drains |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Proposed settlement of sediments | % | 0 | ***38*** | | |

## Drainage Catchment 15

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | | SWF 19 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | | 10/07/2016 |
| **Outfall number** | 15 | | **Version of assessment** | | 1 |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 15 | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.005*** | | |
| Baseflow Index | - | 0.5 | ***0.5*** | | |
| Impermeable road area drained | ha | 1 | ***1.34*** | | |
| Permeable area draining to outfall | ha | 1 | ***0.17*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***0.8*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** | |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Proposed settlement of sediments | % | 0 | ***0*** | | |

## Drainage Catchment 16A

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | | SWF 26 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | | 10/07/2016 |
| **Outfall number** | 16A | | **Version of assessment** | | 1 |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 16A | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.038*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***0.43*** | |
| Permeable area draining to outfall | ha | 1 | ***0.05*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment 16

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | | Non-cumulative assessment (single outfall) |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | | SWF 26 |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | | Jane Huxtable, Jacobs |
| | **Northing** | | **Date of assessment** | | 10/07/2016 |
| **Outfall number** | 16 | | **Version of assessment** | | 1 |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 16 | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.038*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***0.8*** | |
| Permeable area draining to outfall | ha | 1 | ***0.1*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment 17

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Non-cumulative assessment (single outfall) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 26 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 10/07/2016 | |
| **Outfall number** | 17 | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 17 | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.02*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***0.98*** | |
| Permeable area draining to outfall | ha | 1 | ***0.12*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Drainage Catchment 17B

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Non-cumulative assessment (single outfall) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 31 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 10/07/2016 | |
| **Outfall number** | 17B | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | | | | | |
| **Notes** | DM 2036: Routine Runoff Assessment for Catchment 17B | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) |
|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | |
| 95%ile River flow | m3/s | 0 | ***0.009*** | |
| Baseflow Index | - | 0.5 | ***0.5*** | |
| Impermeable road area drained | ha | 1 | ***0.35*** | |
| Permeable area draining to outfall | ha | 1 | ***0.04*** | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***No*** | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***No*** | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | |
| Use Tier 1 | - | TRUE | ***TRUE*** | |
| Use Tier 2 | - | FALSE | ***FALSE*** | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | |
| Tier2 Bed width | m | 3 | ***3*** | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Existing settlement of sediments | % | 0 | ***0*** | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | |
| Proposed settlement of sediments | % | 0 | ***0*** | |

## Routine Runoff Parameters (Cumulative Assessments)

### Drainage Catchments 16A & 16

| | | | | | |
|---|---|---|---|---|---|
| **Road Number** | Existing A96 | | **Assessment type** | Cumulative assessment including sediments (outfalls within 100m) | |
| **HA Area/DBFO number** | | | | | |
| **OS grid reference of assessment point (m)** | **Easting** | | **Receiving watercourse** | SWF 26 | |
| | **Northing** | | **EA receiving water Detailed River Network ID** | | |
| **OS grid reference of outfall structure (m)** | **Easting** | | **Assessor and affiliation** | Jane Huxtable, Jacobs | |
| | **Northing** | | **Date of assessment** | 10/07/2016 | |
| **Outfall number** | | | **Version of assessment** | 1 | |
| **List of outfalls in cumulative assessment** | 16A & 16 | | | | |
| **Notes** | DM 2036: Cumulative Routine Runoff Assessment for Catchments 16A and 16 | | | | |

| Parameter | Units | Default Value | Value used | Notes (Enter notes in the left-hand cells only) | |
|---|---|---|---|---|---|
| **Runoff Risk Assessments** | | | | | |
| AADT | vpd | >10,000 and <50,000 | ***>10,000 and <50,000*** | | |
| Climatic Region | - | Warm Dry | ***Colder Wet*** | | |
| Rainfall Site | - | Ashford (SAAR 710mm) | ***Ardtalnaig (SAAR 1343.9mm)*** | | |
| 95%ile River flow | m3/s | 0 | ***0.038*** | | |
| Baseflow Index | - | 0.5 | ***0.5*** | | |
| Impermeable road area drained | ha | 1 | ***1.23*** | | |
| Permeable area draining to outfall | ha | 1 | ***0.15*** | | |
| Is the discharge in or within 1 km upstream of a protected site for conservation? | - | No | ***Yes*** | | |
| Is there a downstream structure, lake, pond or canal that reduces the velocity within 100m of the point of discharge? | - | No | ***Yes*** | | |
| Hardness | - | Low = <50mg CaCO3/l | ***Low = <50mg CaCO3/l*** | | |
| Use Tier 1 | - | TRUE | ***TRUE*** | | |
| Use Tier 2 | - | FALSE | ***FALSE*** | | |
| Tier 1 Estimated river width at Q95 | 0 | 5 | ***1*** | | |
| Tier2 Bed width | m | 3 | ***3*** | | |
| Tier2 Side slope | m/m | 0.5 | ***0.5*** | | |
| Tier2 Long slope | m/m | 0.0001 | ***0.0001*** | | |
| Tier2 Mannings' n | - | 0.07 | ***0.07*** | | |
| Existing treatment for solubles | % | 0 | ***0*** | ***description for existing measures*** | |
| Existing attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Existing settlement of sediments | % | 0 | ***0*** | | |
| Proposed treatment for solubles | % | 0 | ***0*** | ***description for proposed measures*** | |
| Proposed attenuation -restricted discharge rate | l/s | Unlimited | ***Unlimited*** | | |
| Proposed settlement of sediments | % | 0 | ***0*** | | |

# Routine Runoff Results - DM (Individual Assessments)

## Drainage Catchment 1

### Summary of predictions

**Soluble - Acute Impact**

| Prediction of impact | | Copper | Zinc |
|---|---|---|---|
| | *Step1* | | |
| | *Step2* | | |
| | *Step3* | | |

**Sediment - Chronic Impact**

| Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0** | **0** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0** | **0** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.03 | 0.09 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 0.10 | 0.33 |
| | 90%ile | 0.24 | 0.63 |
| | 95%ile | 0.49 | 1.29 |
| | 99%ile | 1.37 | 6.50 |

*Step 2*

**Velocity** 0.17 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 2

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.1 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.09 | 0.28 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.29 | 0.94 |
| | 90%ile | 0.72 | 1.81 |
| | 95%ile | 1.44 | 3.79 |
| | 99%ile | 4.05 | 18.49 |

**Step 2**

**Velocity** 0.05 m/s — Tier 1 is used for the calculation

**DI** 45.88

**% settlement needed** 0 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 3

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.1 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.10 | 0.33 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.34 | 1.11 |
| | 90%ile | 0.86 | 2.16 |
| | 95%ile | 1.71 | 4.42 |
| | 99%ile | 4.56 | 21.10 |

**Step 2**

**Velocity** 0.06 m/s

Tier 1 is used for the calculation

**DI** 39.80

**% settlement needed** 0 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 5

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | *Step1* | | | | | | | | | | |
| | *Step2* | | | | | | | | | | |
| | *Step3* | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics Mean | | 23.36 | 67.70 |
| 90%ile | | 45.65 | 147.58 |
| 95%ile | | 54.99 | 194.62 |
| 99%ile | | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | Toxicity Threshold | | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **0.1** | **0.4** |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0.1 | 0.2 |
| No. of exceedances/worst summer | | 1 | 1 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0** | **0** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.21 | 0.65 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics Mean | | 0.64 | 2.06 |
| 90%ile | | 1.76 | 4.47 |
| 95%ile | | 3.38 | 8.64 |
| 99%ile | | 7.97 | 36.48 |

*Step 2*

**Velocity** 0.12 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics Mean | | - | - |
| 90%ile | | - | - |
| 95%ile | | - | - |
| 99%ile | | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 6

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics Mean | | 23.36 | 67.70 |
| 90%ile | | 45.65 | 147.58 |
| 95%ile | | 54.99 | 194.62 |
| 99%ile | | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **0.1** | **0.9** |
| No. of exceedances/worst year | | 1 | 3 |
| No. of exceedances/summer | | 0.1 | 0.6 |
| No. of exceedances/worst summer | | 1 | 3 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0** | **0** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.26 | 0.82 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics Mean | | 0.80 | 2.53 |
| 90%ile | | 2.16 | 5.61 |
| 95%ile | | 4.40 | 10.85 |
| 99%ile | | 9.82 | 44.57 |

**Step 2**

**Velocity** 0.02 m/s — Tier 1 is used for the calculation

**DI** 176.64

**% settlement needed** 44 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics Mean | | - | - |
| 90%ile | | - | - |
| 95%ile | | - | - |
| 99%ile | | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 9

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.3 | 1.5 |
| No. of exceedances/worst year | | 1 | 4 |
| No. of exceedances/summer | | 0.1 | 0.9 |
| No. of exceedances/worst summer | | 1 | 4 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.2 |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.42 | 1.32 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 1.24 | 3.84 |
| | 90%ile | 3.68 | 9.05 |
| | 95%ile | 6.55 | 16.87 |
| | 99%ile | 13.52 | 58.70 |

**Step 2**

**Velocity** 0.03 m/s — Tier 1 is used for the calculation

**DI** 210.52

**% settlement needed** 53 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 10

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0 | 0.6 |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0.4 |
| No. of exceedances/worst summer | | 0 | 2 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.23 | 0.70 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.69 | 2.19 |
| | 90%ile | 1.81 | 4.50 |
| | 95%ile | 3.79 | 9.31 |
| | 99%ile | 9.45 | 36.57 |

**Step 2**

**Velocity** 0.02 m/s — Tier 1 is used for the calculation

**DI** 99.32

**% settlement needed** 0 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 12

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0 | 0.1 |
| No. of exceedances/worst year | | 0 | 1 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.13 | 0.42 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.42 | 1.38 |
| | 90%ile | 1.09 | 2.75 |
| | 95%ile | 2.18 | 5.54 |
| | 99%ile | 5.54 | 26.08 |

**Step 2**

**Velocity** 0.31 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 13

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

| | | Step 1 Copper | Step 1 Zinc | Step 1 Copper | Step 1 Zinc | Step 1 Cadmium | Step 1 Total PAH | Step 1 Pyrene | Step 1 Fluoranthene | Step 1 Anthracene | Step 1 Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RST24 | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 81 | 64 | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | RST6 | | | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | | | | | | | | |
| **No. of exceedances/year** | | 18.00 | 20.60 | | | | | | | | |
| No. of exceedances/worst year | | 24 | 27 | | | | | | | | |
| | | (ug/l) | (ug/l) | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | RST24 | 21 | 60 | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Thresholds | RST6 | 42 | 120 | Toxicity Threshold | | | | | | | |
| Event Statistics Mean | | 23.36 | 67.70 | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | | 45.65 | 147.58 | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | | 54.99 | 194.62 | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | | 96.36 | 372.28 | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

| | | Step 2 Copper | Step 2 Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 1.1 | 2.1 |
| No. of exceedances/worst year | | 3 | 5 |
| No. of exceedances/summer | | 0.5 | 1.1 |
| No. of exceedances/worst summer | | 2 | 5 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0.6 |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0.3 |
| No. of exceedances/worst summer | | 0 | 2 |
| Annual average concentration (ug/l) | | 0.62 | 1.92 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics Mean | | 1.74 | 5.32 |
| 90%ile | | 5.40 | 13.18 |
| 95%ile | | 9.21 | 23.90 |
| 99%ile | | 17.12 | 73.77 |

**Velocity** 0.01 m/s — Tier 1 is used for the calculation

**DI** 313.61

**% settlement needed** 69 %

### In River (with mitigation)

| | | Step 3 Copper | Step 3 Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.80 | 2.00 |
| No. of exceedances/worst year | | 2 | 5 |
| No. of exceedances/summer | | 0.4 | 1.1 |
| No. of exceedances/worst summer | | 2 | 5 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0.00 | 0.40 |
| No. of exceedances/worst year | | 0 | 2 |
| No. of exceedances/summer | | 0 | 0.1 |
| No. of exceedances/worst summer | | 0 | 1 |
| Annual average concentration (ug/l) | | 0.57 | 1.78 |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics Mean | | 1.62 | 4.95 |
| 90%ile | | 5.03 | 12.25 |
| 95%ile | | 8.56 | 22.23 |
| 99%ile | | 15.92 | 68.61 |

**DI** 194.44

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 15

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RST24 | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 81 | 64 | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | RST6 | | | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | | | | | | | | |
| **No. of exceedances/year** | | 18.00 | 20.60 | | | | | | | | |
| No. of exceedances/worst year | | 24 | 27 | | | | | | | | |
| | | (ug/l) | (ug/l) | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | RST24 | 21 | 60 | Toxicity Threshold 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Thresholds | RST6 | 42 | 120 | | | | | | | | |
| Event Statistics | Mean | 23.36 | 67.70 | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 45.65 | 147.58 | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 54.99 | 194.62 | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 96.36 | 372.28 | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0.1 | 0.8 |
| No. of exceedances/worst year | | 1 | 2 |
| No. of exceedances/summer | | 0.1 | 0.5 |
| No. of exceedances/worst summer | | 1 | 2 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.24 | 0.76 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.74 | 2.37 |
| | 90%ile | 2.02 | 5.20 |
| | 95%ile | 4.10 | 10.04 |
| | 99%ile | 9.28 | 42.27 |

*Step 2*

**Velocity** 0.06 m/s — Tier 1 is used for the calculation

**DI** 77.79

**% settlement needed** 0 %

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 16

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.02 | 0.07 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.08 | 0.26 |
| | 90%ile | 0.18 | 0.45 |
| | 95%ile | 0.36 | 0.97 |
| | 99%ile | 1.10 | 5.09 |

**Step 2**

**Velocity** 0.32 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 16A

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.01 | 0.04 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.04 | 0.14 |
| | 90%ile | 0.10 | 0.24 |
| | 95%ile | 0.20 | 0.53 |
| | 99%ile | 0.61 | 2.85 |

**Step 2**

**Velocity** 0.32 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 17

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

| | | Step 1 Copper | Step 1 Zinc | Step 1 Copper | Step 1 Zinc | Step 1 Cadmium | Step 1 Total PAH | Step 1 Pyrene | Step 1 Fluoranthene | Step 1 Anthracene | Step 1 Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RST24 | | Toxicity Threshold | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | | 81 | 64 | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | | RST6 | | | | | | | | | |
| Allowable Exceedances/year | | 1 | 1 | | | | | | | | |
| **No. of exceedances/year** | | 18.00 | 20.60 | | | | | | | | |
| No. of exceedances/worst year | | 24 | 27 | | | | | | | | |
| | | (ug/l) | (ug/l) | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Thresholds | RST24 | 21 | 60 | Toxicity Threshold 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Thresholds | RST6 | 42 | 120 | | | | | | | | |
| Event Statistics | Mean | 23.36 | 67.70 | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| | 90%ile | 45.65 | 147.58 | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| | 95%ile | 54.99 | 194.62 | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| | 99%ile | 96.36 | 372.28 | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

| | | Step 2 Copper | Step 2 Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.05 | 0.16 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.17 | 0.56 |
| | 90%ile | 0.42 | 1.04 |
| | 95%ile | 0.82 | 2.20 |
| | 99%ile | 2.42 | 10.80 |

Step 2

**Velocity** 0.17 m/s — Tier 1 is used for the calculation

**DI** -

**% settlement needed** - %

### In River (with mitigation)

| | | Step 3 Copper | Step 3 Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

Step 3

**DI** -

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Drainage Catchment 17B

## Summary of predictions

| | | Soluble - Acute Impact | | Sediment - Chronic Impact | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Copper | Zinc | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
| Prediction of impact | Step1 | | | | | | | | | | |
| | Step2 | | | | | | | | | | |
| | Step3 | | | | | | | | | | |

## DETAILED RESULTS

### In Runoff

**Step 1**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 63.00 | 56.70 |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 18.00 | 20.60 |
| No. of exceedances/worst year | | 24 | 27 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

**Step 1**

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | 83.80 | 112.10 | 2.20 | 48.30 | 111.00 | 48.30 | 23.00 | 91.00 |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | (mg/kg) | (mg/kg) | (mg/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) | (ug/kg) |
| Toxicity Threshold | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

**Step 2**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | 0 | 0 |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.04 | 0.12 |
| | | (ug/l) | (ug/l) |
| Thresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | 0.13 | 0.45 |
| | 90%ile | 0.32 | 0.81 |
| | 95%ile | 0.64 | 1.73 |
| | 99%ile | 2.00 | 9.00 |

**Step 2**

**Velocity** 0.08 m/s — Tier 1 is used for the calculation

**DI** 10.21

**% settlement needed** 0 %

### In River (with mitigation)

**Step 3**

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 2 | 2 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | - | - |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | (ug/l) | (ug/l) |
| Thresholds hresholds | RST24 | 21 | 60 |
| Thresholds | RST6 | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

**Details of the chosen rainfall site**

| | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# Routine Runoff Results - DM (Cumulative Assessments)

## Drainage Catchments 16A & 16

### Summary of predictions

**Soluble - Acute Impact**

| | | Copper | Zinc |
|---|---|---|---|
| Prediction of impact | *Step1* | | |
| | *Step2* | | |
| | *Step3* | | |

**Sediment - Chronic Impact**

| | | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|---|
| Prediction of impact | *Step1* | | | | | | | | |
| | *Step2* | | | | | | | | |
| | *Step3* | | | | | | | | |

## DETAILED RESULTS

### In Runoff

*Step 1*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **63.00** | **56.70** |
| No. of exceedances/worst year | | 81 | 64 |
| | | RST6 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **18.00** | **20.60** |
| No. of exceedances/worst year | | 24 | 27 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 23.36 | 67.70 |
| | 90%ile | 45.65 | 147.58 |
| | 95%ile | 54.99 | 194.62 |
| | 99%ile | 96.36 | 372.28 |

*Step 1*

| | Copper | Zinc | Cadmium | Total PAH | Pyrene | Fluoranthene | Anthracene | Phenanthrene |
|---|---|---|---|---|---|---|---|---|
| | | | | | Toxicity Threshold | | | |
| Allowable Exceedances/year | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **No. of exceedances/year** | **83.80** | **112.10** | **2.20** | **48.30** | **111.00** | **48.30** | **23.00** | **91.00** |
| No. of exceedances/worst year | 97 | 128 | 7 | 59 | 127 | 59 | 32 | 101 |
| | *(mg/kg)* | *(mg/kg)* | *(mg/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* | *(ug/kg)* |
| ***Toxicity Threshold*** | 197 | 315 | 3.5 | 16770 | 875 | 2355 | 245 | 515 |
| Event Statistics Mean | 331 | 1165 | 1 | 16068 | 2780 | 2667 | 170 | 752 |
| 90%ile | 733 | 2672 | 2 | 35481 | 6138 | 5890 | 376 | 1661 |
| 95%ile | 962 | 3572 | 3 | 70795 | 12247 | 11752 | 750 | 3313 |
| 99%ile | 1383 | 5637 | 4 | 89125 | 15419 | 14795 | 945 | 4171 |

### In River (no mitigation)

*Step 2*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **0** | **0** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **0** | **0** |
| No. of exceedances/worst year | | 0 | 0 |
| No. of exceedances/summer | | 0 | 0 |
| No. of exceedances/worst summer | | 0 | 0 |
| Annual average concentration (ug/l) | | 0.03 | 0.11 |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | 0.11 | 0.39 |
| | 90%ile | 0.28 | 0.69 |
| | 95%ile | 0.55 | 1.48 |
| | 99%ile | 1.66 | 7.49 |

*Step 2*

**Velocity** 0.32 m/s

**DI** -

**% settlement needed** - %

Tier 1 is used for the calculation

### In River (with mitigation)

*Step 3*

| | | Copper | Zinc |
|---|---|---|---|
| | | RST24 | |
| Allowable Exceedances/year | | 1 | 1 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| | | RST6 | |
| Allowable Exceedances/year | | 0.5 | 0.5 |
| **No. of exceedances/year** | | **-** | **-** |
| No. of exceedances/worst year | | - | - |
| No. of exceedances/summer | | - | - |
| No. of exceedances/worst summer | | - | - |
| Annual average concentration (ug/l) | | - | - |
| | | *(ug/l)* | *(ug/l)* |
| Thresholds hresholds | ***RST24*** | 21 | 60 |
| Thresholds | ***RST6*** | 42 | 120 |
| Event Statistics | Mean | - | - |
| | 90%ile | - | - |
| | 95%ile | - | - |
| | 99%ile | - | - |

**DI** -

| Details of the chosen rainfall site | |
|---|---|
| **SAAR (mm)** | **1343.9** |
| **Altitude (m)** | **130** |
| **Easting** | **2704** |
| **Northing** | **7389** |
| **Coastal distance (km)** | **58** |

# 6 References

Highways Agency, Transport Scotland, Welsh Assembly Government and The Department of Regional Development for Northern Ireland (2006). Design Manual for Roads and Bridges Volume 4, Section 2, Part 1, Vegetated Drainage Systems for Highway Runoff, 2006.

Highways Agency, Transport Scotland, Welsh Assembly Government and The Department of Regional Development for Northern Ireland (2009). Design Manual for Roads and Bridges Volume 11, Section 3, Part 10, Road Drainage and the Water Environment, 2009.