

Appendix K3

HEWRAT Analysis

Location Details

Road Number	A29 South of Barnham Road		Assessment type	Non-cumulative assessment (single outfall)		
HE Area/DBFO number			Receiving watercourse	School Stream		
OS grid reference of assessment point (m)	Easting	495049	EA receiving water Detailed River Network ID	N/A		
	Northing	104951	Assessor and affiliation	D Allum-Rooney BSc (Hons) MSc		
OS grid reference of outfall structure (m)	Easting	495049	Date of assessment	08/06/2021		
	Northing	104951	Version of assessment	P01		
Outfall number	Pond 2					
List of outfalls in cumulative assessment						
Notes						

Parameter	Units	Default Value	Value used	Notes	
Runoff Risk Assessments					
AADT	vpd	>10,000 and <50,000	>10,000 and <50,000		
Climatic Region	-	Warm Dry	Warm Wet		
Rainfall Site	-	Ashford (SAAR 710mm)	Southampton (SAAR 820mm)		
Q95 River flow	m3/s	0	0.00135		
Baseflow Index	-	0.5	0.67		
Impermeable road area drained	ha	1	0.7564		
Permeable area draining to outfall	ha	0	0		
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	2.5		
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	Roadside swale draining to detention basin
Existing attenuation -restricted discharge rate	l/s	No restriction	No restriction		
Existing settlement of sediments	%	0	0	Description for proposed measures	
Proposed treatment for solubles	%	0	50		
Proposed attenuation -restricted discharge rate	l/s	No restriction	3		
Proposed settlement of sediments	%	0	90		
EQ5, bio avail dissolved Cu	ug/l	1	1		
EQ5, bio avail dissolved Zn	ug/l	10.9	10.9		
Ambient background concentration, dissolved copper	ug/l	0	0		
Spillage Risk Assessments					
A MainRoad					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/y ear	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
B					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/y ear	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
C					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/y ear	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
D					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/y ear	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
E					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			

Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
F				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
Justification for choice of existing measures factors				
Justification for choice of proposed measures factors				
Groundwater Assessments				
Traffic flow	-	-		
Rainfall depth (annual averages)	-	-		
Drainage area ratio	-	-		
Infiltration method	-	-		
Unsaturated zone	-	-		
Flow type (Incorporates flow type an effective grain size)	-	-		
Unsaturated Zone Clay Content	-	-		
Organic Carbon	-	-		
Unsaturated zone soil pH	-	-		

Summary of predictions

Soluble - Acute Impact

Sediment - Chronic Impact

Prediction of impact	Step1
	Step2
	Step3

Copper	Zinc

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

Pond 2

In Runoff

Step 1

Step 1

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Thresholds

Thresholds

Event Statistics
Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
1	1
67.90	62.20
89	75

Copper	Zinc
RST6	
1	1
21.70	25.30
28	29

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

27.32	84.71
52.94	172.88
68.76	255.14
113.86	446.19

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
1	1	1	1	1	1	1	1
75.30	98.00	1.50	17.00	56.00	17.00	14.80	31.10
99	120	4	25	71	25	22	39

	(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

349	1168	1	11065	1914	1837	117	518
786	2781	1	28184	4876	4679	299	1319
968	3569	2	56234	9729	9335	596	2632
1501	5477	4	112202	19411	18626	1189	5251

In River (no mitigation)

Step 2

Step 2

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics
Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
2	2
0.7	1
2	2
0.3	0.4
1	2

Copper	Zinc
RST6	
1	1
0.1	0.2
1	1
0	0.1
0	1

0.30	1.08
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	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

1.27	3.93
3.50	10.67
6.33	18.08
15.53	48.48

Velocity 0.00 m/s

Tier 1 is used for the calculation

DI 71.27

Minimum % settlement 0 %

In River (with mitigation)

Step 3

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics
Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
2	2
0.10	0.20
1	1
0	0.1
0	1

Copper	Zinc
RST6	
1	1
0.00	0.00
0	0
0	0
0	0

0.15	0.54
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	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.63	1.94
1.75	5.33
3.11	8.87
7.30	23.94

DI 7.13

Details of the chosen rainfall site

SAAR (mm) 820
Altitude (m) 25
Easting 3561
Northing 1754
Coastal distance (km) 10

Location Details

Road Number	A29 South of Barnham Road	Assessment type	Non-cumulative assessment (single outfall)
HE Area/DBFO number		Receiving watercourse	Lidsey Rife Tributary
OS grid reference of assessment point (m)	Easting 494539 Northing 104779	EA receiving water Detailed River Network ID	N/A
OS grid reference of outfall structure (m)	Easting 494539 Northing 104779	Assessor and affiliation	D Allum-Rooney BSc (Hons) MSc
Outfall number	Pond 3	Date of assessment	08/06/2021
List of outfalls in cumulative assessment		Version of assessment	P01
Notes			

Parameter	Units	Default Value	Value used	Notes
Runoff Risk Assessments				
AADT	vpd	>10,000 and <50,000	>10,000 and <50,000	
Climatic Region	-	Warm Dry	Warm Wet	
Rainfall Site	-	Ashford (SAAR 710mm)	Southampton (SAAR 820mm)	
Q95 River flow	m3/s	0	0.00118	
Baseflow Index	-	0.5	0.66	
Impermeable road area drained	ha	1	1.7513	
Permeable area draining to outfall	ha	0	0	
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	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	No restriction	No restriction	
Existing settlement of sediments	%	0	0	Description for proposed measures
Proposed treatment for solubles	%	0	50	
Proposed attenuation -restricted discharge rate	l/s	No restriction	6.1	
Proposed settlement of sediments	%	0	90	
EQ5, bio avail dissolved Cu	ug/l	1	1	
EQ5, bio avail dissolved Zn	ug/l	10.9	10.9	
Ambient background concentration, dissolved copper	ug/l	0	0	
Spillage Risk Assessments				
A Main Road				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/year	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
B				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/year	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
C				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/year	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
D				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/year	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
E				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		

Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
F				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
Justification for choice of existing measures factors				
Justification for choice of proposed measures factors				
Groundwater Assessments				
Traffic flow	-	-		
Rainfall depth (annual averages)	-	-		
Drainage area ratio	-	-		
Infiltration method	-	-		
Unsaturated zone	-	-		
Flow type (Incorporates flow type an effective grain size)	-	-		
Unsaturated Zone Clay Content	-	-		
Organic Carbon	-	-		
Unsaturated zone soil pH	-	-		

Summary of predictions

Soluble - Acute Impact

Sediment - Chronic Impact

Prediction of impact	Step1
	Step2
	Step3

Copper	Zinc

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

Pond 3

In Runoff

Step 1

Step 1

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Copper	Zinc
RST24	
1	1
67.90	62.20
89	75

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
Toxicity Threshold							
1	1	1	1	1	1	1	1
75.30	98.00	1.50	17.00	56.00	17.00	14.80	31.10
99	120	4	25	71	25	22	39

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Copper	Zinc
RST6	
1	1
21.70	25.30
28	29

(mg/kg)	(mg/kg)	(mg/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
197	315	3.5	16770	875	2355	245	515

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

(ug/l)	(ug/l)
RST24	
21	60
RST6	
42	120

349	1168	1	11065	1914	1837	117	518
786	2781	1	28184	4876	4679	299	1319
968	3569	2	56234	9729	9335	596	2632
1501	5477	4	112202	19411	18626	1189	5251

In River (no mitigation)

Step 2

Step 2

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Copper	Zinc
RST24	
2	2
2.2	3
5	6
1.2	1.2
5	5

Velocity 0.00 m/s

Tier 1 is used for the calculation

DI 104.40

Minimum % settlement 5 %

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Copper	Zinc
RST6	
1	1
0.1	0.7
1	3
0	0.2
0	1

Annual average concentration (ug/l)

0.66	2.38
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Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

(ug/l)	(ug/l)
RST24	
21	60
RST6	
42	120

In River (with mitigation)

Step 3

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Copper	Zinc
RST24	
2	2
0.10	0.70
1	3
0	0.2
0	1

DI 10.44

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Copper	Zinc
RST6	
1	1
0.00	0.10
0	1
0	0.1
0	1

Annual average concentration (ug/l)

0.33	1.20
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Thresholds
Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

(ug/l)	(ug/l)
RST24	
21	60
RST6	
42	120

Details of the chosen rainfall site

SAAR (mm) 820
Altitude (m) 25
Easting 3561
Northing 1754
Coastal distance (km) 10

Location Details

Road Number	A29 South of Barnham Road	Assessment type	Non-cumulative assessment (single outfall)
HE Area/DBFO number		Receiving watercourse	School Stream
OS grid reference of assessment point (m)	Easting 495345 Northing 104364	EA receiving water Detailed River Network ID	N/A
OS grid reference of outfall structure (m)	Easting 495345 Northing 104364	Assessor and affiliation	D Allum-Rooney BSc (Hons) MSc
Outfall number	Pond 4	Date of assessment	08/06/2021
List of outfalls in cumulative assessment		Version of assessment	P01
Notes	NOTE: AADT (two way) figure is ~3000 so below lower limit of software inputs. Impacts are likely to be less significant than predicted, but included for completeness		

Parameter	Units	Default Value	Value used	Notes	
Runoff Risk Assessments					
AADT	vpd	>10,000 and <50,000	>10,000 and <50,000		
Climatic Region	-	Warm Dry	Warm Wet		
Rainfall Site	-	Ashford (SAAR 710mm)	Southampton (SAAR 820mm)		
Q95 River flow	m3/s	0	0.00135		
Baseflow Index	-	0.5	0.67		
Impermeable road area drained	ha	1	0.8016		
Permeable area draining to outfall	ha	0	0		
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	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	Roadside swale draining to detention basin
Existing attenuation -restricted discharge rate	l/s	No restriction	No restriction		
Existing settlement of sediments	%	0	0		
Proposed treatment for solubles	%	0	50	Description for proposed measures	
Proposed attenuation -restricted discharge rate	l/s	No restriction	3		
Proposed settlement of sediments	%	0	90		
EQ5, bio avail dissolved Cu	ug/l	1	1		
EQ5, bio avail dissolved Zn	ug/l	10.9	10.9		
Ambient background concentration, dissolved copper	ug/l	0	0		
Spillage Risk Assessments					
A MainRoad					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
B					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
C					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
D					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
E					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			

Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
F				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
Justification for choice of existing measures factors				
Justification for choice of proposed measures factors				
Groundwater Assessments				
Traffic flow	-	-		
Rainfall depth (annual averages)	-	-		
Drainage area ratio	-	-		
Infiltration method	-	-		
Unsaturated zone	-	-		
Flow type (Incorporates flow type an effective grain size)	-	-		
Unsaturated Zone Clay Content	-	-		
Organic Carbon	-	-		
Unsaturated zone soil pH	-	-		

Summary of predictions

Soluble - Acute Impact

Sediment - Chronic Impact

Prediction of impact	Step1
	Step2
	Step3

Pond 4

Copper	Zinc

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

In Runoff

Step 1

Step 1

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year

Thresholds

Thresholds

Event Statistics Mean
 90%ile
 95%ile
 99%ile

Copper	Zinc
RST24	
1	1
67.90	62.20
89	75

Copper	Zinc
RST6	
1	1
21.70	25.30
28	29

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

27.32	84.71
52.94	172.88
68.76	255.14
113.86	446.19

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
Toxicity Threshold							
1	1	1	1	1	1	1	1
75.30	98.00	1.50	17.00	56.00	17.00	14.80	31.10
99	120	4	25	71	25	22	39

	(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

349	1168	1	11065	1914	1837	117	518
786	2781	1	28184	4876	4679	299	1319
968	3569	2	56234	9729	9335	596	2632
1501	5477	4	112202	19411	18626	1189	5251

In River (no mitigation)

Step 2

Step 2

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
 90%ile
 95%ile
 99%ile

Copper	Zinc
RST24	
2	2
0.8	1
2	2
0.4	0.4
1	2

Copper	Zinc
RST6	
1	1
0.1	0.3
1	1
0	0.1
0	1

0.32	1.13
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

1.32	4.11
3.67	11.20
6.62	18.95
16.22	51.03

Velocity m/s

Tier 1 is used for the calculation

DI Minimum % settlement %

In River (with mitigation)

Step 3

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
 90%ile
 95%ile
 99%ile

Copper	Zinc
RST24	
2	2
0.10	0.30
1	1
0	0.1
0	1

Copper	Zinc
RST6	
1	1
0.00	0.00
0	0
0	0
0	0

0.16	0.57
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.65	2.03
1.83	5.60
3.25	9.28
7.49	25.20

DI

Details of the chosen rainfall site

SAAR (mm) 820
 Altitude (m) 25
 Easting 3561
 Northing 1754
 Coastal distance (km) 10

Location Details

Road Number	A29 South of Barnham Road		Assessment type	Non-cumulative assessment (single outfall)		
HE Area/DBFO number			Receiving watercourse	School Stream		
OS grid reference of assessment point (m)	Easting	494864	EA receiving water Detailed River Network ID	N/A		
	Northing	103951	Assessor and affiliation	D Allum-Rooney BSc (Hons) MSc		
OS grid reference of outfall structure (m)	Easting	494864	Date of assessment	08/06/2021		
	Northing	103951	Version of assessment	P01		
Outfall number	Pond 5					
List of outfalls in cumulative assessment						
Notes						

Parameter	Units	Default Value	Value used	Notes	
Runoff Risk Assessments					
AADT	vpd	>10,000 and <50,000	>10,000 and <50,000		
Climatic Region	-	Warm Dry	Warm Wet		
Rainfall Site	-	Ashford (SAAR 710mm)	Southampton (SAAR 820mm)		
Q95 River flow	m3/s	0	0.00135		
Baseflow Index	-	0.5	0.67		
Impermeable road area drained	ha	1	0.8016		
Permeable area draining to outfall	ha	0	0		
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	3		
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	Roadside swale draining to detention basin
Existing attenuation -restricted discharge rate	l/s	No restriction	No restriction		
Existing settlement of sediments	%	0	0	Description for proposed measures	
Proposed treatment for solubles	%	0	50		
Proposed attenuation -restricted discharge rate	l/s	No restriction	3		
Proposed settlement of sediments	%	0	90		
EQ5, bio avail dissolved Cu	ug/l	1	1		
EQ5, bio avail dissolved Zn	ug/l	10.9	10.9		
Ambient background concentration, dissolved copper	ug/l	0	0		
Spillage Risk Assessments					
A MainRoad					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
B					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
C					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
D					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
E					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			

Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
F				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
Justification for choice of existing measures factors				
Justification for choice of proposed measures factors				
Groundwater Assessments				
Traffic flow	-	-		
Rainfall depth (annual averages)	-	-		
Drainage area ratio	-	-		
Infiltration method	-	-		
Unsaturated zone	-	-		
Flow type (Incorporates flow type an effective grain size)	-	-		
Unsaturated Zone Clay Content	-	-		
Organic Carbon	-	-		
Unsaturated zone soil pH	-	-		

Summary of predictions

Soluble - Acute Impact

Sediment - Chronic Impact

Prediction of impact	Step1
	Step2
	Step3

Copper	Zinc

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

Pond 5

In Runoff

Step 1

Step 1

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Thresholds

Thresholds

Event Statistics
Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
1	1
67.90	62.20
89	75

Copper	Zinc
RST6	
1	1
21.70	25.30
28	29

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

27.32	84.71
52.94	172.88
68.76	255.14
113.86	446.19

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
1	1	1	1	1	1	1	1
75.30	98.00	1.50	17.00	56.00	17.00	14.80	31.10
99	120	4	25	71	25	22	39

	(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

349	1168	1	11065	1914	1837	117	518
786	2781	1	28184	4876	4679	299	1319
968	3569	2	56234	9729	9335	596	2632
1501	5477	4	112202	19411	18626	1189	5251

In River (no mitigation)

Step 2

Step 2

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics
Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
2	2
0.8	1
2	2
0.4	0.4
1	2

Copper	Zinc
RST6	
1	1
0.1	0.3
1	1
0	0.1
0	1

0.32	1.13
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

1.32	4.11
3.67	11.20
6.62	18.95
16.22	51.03

Velocity 0.00 m/s

Tier 1 is used for the calculation

DI 63.70

Minimum % settlement 0 %

In River (with mitigation)

Step 3

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics
Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
2	2
0.10	0.30
1	1
0	0.1
0	1

Copper	Zinc
RST6	
1	1
0.00	0.00
0	0
0	0
0	0

0.16	0.57
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.65	2.03
1.83	5.60
3.25	9.28
7.49	25.20

DI 6.37

Details of the chosen rainfall site

SAAR (mm) 820
Altitude (m) 25
Easting 3561
Northing 1754
Coastal distance (km) 10

User parameters

Pond 6

Location Details

Road Number	A29 South of Barnham Road		Assessment type	Cumulative assessment including sediments (outfalls within 100m)		
HE Area/DBFO number			Receiving watercourse	Lidsey Rife		
OS grid reference of assessment point (m)	Eastings	494612	EA receiving water Detailed River Network ID	GB107041012010		
	Northing	103840	Assessor and affiliation	D Allum-Rooney BSc (Hons) MSc		
OS grid reference of outfall structure (m)	Eastings	494612	Date of assessment	08/06/2021		
	Northing	103840	Version of assessment	P01		
Outfall number	Pond 6			Pond 7	Pond 8	Pond 9
List of outfalls in cumulative assessment	Pond 6					
Notes	Note: Indirect outfall to Lidsey Rife via short tributary					

Parameter	Units	Default Value	Value used	Notes		
Runoff Risk Assessments						
AADT	vpd	>10,000 and <50,000	>10,000 and <50,000			
Climatic Region	-	Warm Dry	Warm Wet			
Rainfall Site	-	Ashford (SAAR 710mm)	Southampton (SAAR 820mm)			
Q95 River flow	m3/s	0	0.0837			
Baseflow Index	-	0.5	0.85			
Impermeable road area drained	ha	1	1.3288			
Permeable area draining to outfall	ha	0	0			
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	12			
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	Roadside swale draining to detention basin	
Existing attenuation -restricted discharge rate	l/s	No restriction	No restriction			
Existing settlement of sediments	%	0	0	Description for proposed measures		
Proposed treatment for solubles	%	0	50			
Proposed attenuation -restricted discharge rate	l/s	No restriction	3.4			
Proposed settlement of sediments	%	0	90			
EQ5, bio avail dissolved Cu	ug/l	1	1			
EQ5, bio avail dissolved Zn	ug/l	10.9	10.9			
Ambient background concentration, dissolved copper	ug/l	0	0			
Spillage Risk Assessments						
A MainRoad						
Water body type	-	-				
Length of road draining to outfall	m	-				
Road Type (A-road or Motorway)	-	-				
If A road, is site urban or rural?	-	-				
Junction type	-	-				
Location	-	-				
Traffic flow (AADT two way)	-	-				
% HGV	-	-				
Spillage factor	no/109H GVkm/year	-				
Existing measures factor	-	-				
Proposed measures factor	-	-				
B						
Water body type	-	-				
Length of road draining to outfall	m	-				
Road Type (A-road or Motorway)	-	-				
If A road, is site urban or rural?	-	-				
Junction type	-	-				
Location	-	-				
Traffic flow (AADT two way)	-	-				
% HGV	-	-				
Spillage factor	no/109H GVkm/year	-				
Existing measures factor	-	-				
Proposed measures factor	-	-				
C						
Water body type	-	-				
Length of road draining to outfall	m	-				
Road Type (A-road or Motorway)	-	-				
If A road, is site urban or rural?	-	-				
Junction type	-	-				
Location	-	-				
Traffic flow (AADT two way)	-	-				
% HGV	-	-				
Spillage factor	no/109H GVkm/year	-				
Existing measures factor	-	-				
Proposed measures factor	-	-				
D						
Water body type	-	-				
Length of road draining to outfall	m	-				
Road Type (A-road or Motorway)	-	-				
If A road, is site urban or rural?	-	-				
Junction type	-	-				
Location	-	-				
Traffic flow (AADT two way)	-	-				
% HGV	-	-				
Spillage factor	no/109H GVkm/year	-				
Existing measures factor	-	-				
Proposed measures factor	-	-				
E						
Water body type	-	-				
Length of road draining to outfall	m	-				
Road Type (A-road or Motorway)	-	-				
If A road, is site urban or rural?	-	-				

Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
F				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
Justification for choice of existing measures factors				
Justification for choice of proposed measures factors				
Groundwater Assessments				
Traffic flow	-	-		
Rainfall depth (annual averages)	-	-		
Drainage area ratio	-	-		
Infiltration method	-	-		
Unsaturated zone	-	-		
Flow type (Incorporates flow type an effective grain size)	-	-		
Unsaturated Zone Clay Content	-	-		
Organic Carbon	-	-		
Unsaturated zone soil pH	-	-		

Summary of predictions

Prediction of impact	Step1
	Step2
	Step3

Pond 6

Soluble - Acute Impact

Copper	Zinc

Sediment - Chronic Impact

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

In Runoff

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 1

Copper	Zinc
RST24	
1	1
67.90	62.20
89	75

Copper	Zinc
RST6	
1	1
21.70	25.30
28	29

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

27.32	84.71
52.94	172.88
68.76	255.14
113.86	446.19

Step 1

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
Toxicity Threshold							
1	1	1	1	1	1	1	1
75.30	98.00	1.50	17.00	56.00	17.00	14.80	31.10
99	120	4	25	71	25	22	39

	(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

349	1168	1	11065	1914	1837	117	518
786	2781	1	28184	4876	4679	299	1319
968	3569	2	56234	9729	9335	596	2632
1501	5477	4	112202	19411	18626	1189	5251

In River (no mitigation)

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 2

Copper	Zinc
RST24	
2	2
0	0
0	0
0	0
0	0

Copper	Zinc
RST6	
1	1
0	0
0	0
0	0
0	0

0.01	0.04
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.05	0.16
0.12	0.38
0.25	0.65
0.75	2.05

Velocity 0.01 m/s

Tier 1 is used for the calculation

DI 18.96

Minimum % settlement 0 %

In River (with mitigation)

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Step 3

Copper	Zinc
RST24	
2	2
0.00	0.00
0	0
0	0
0	0

Copper	Zinc
RST6	
1	1
0.00	0.00
0	0
0	0
0	0

0.01	0.02
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.02	0.07
0.06	0.19
0.12	0.31
0.28	0.89

DI 1.90

Details of the chosen rainfall site

SAAR (mm) 820
Altitude (m) 25
Easting 3561
Northing 1754
Coastal distance (km) 10

User parameters

Pond 7

Location Details

Road Number	A29 South of Barnham Road		Assessment type	Cumulative assessment including sediments (outfalls within 100m)		
HE Area/DBFO number			Receiving watercourse	Lidsey Rife		
OS grid reference of assessment point (m)	Eastings	494278	EA receiving water Detailed River Network ID	GB107041012010		
	Northings	103535	Assessor and affiliation	D Allum-Rooney BSc (Hons) MSc		
OS grid reference of outfall structure (m)	Eastings	494278	Date of assessment	08/06/2021		
	Northings	103535	Version of assessment	P01		
Outfall number	Pond 7			Pond 8	Pond 9	
List of outfalls in cumulative assessment	Pond 6		Pond 7			
Notes						

Parameter	Units	Default Value	Value used	Notes	
Runoff Risk Assessments					
AADT	vpd	>10,000 and <50,000	>10,000 and <50,000		
Climatic Region	-	Warm Dry	Warm Wet		
Rainfall Site	-	Ashford (SAAR 710mm)	Southampton (SAAR 820mm)		
Q95 River flow	m3/s	0	0.0837		
Baseflow Index	-	0.5	0.85		
Impermeable road area drained	ha	1	1.3288		
Permeable area draining to outfall	ha	0	0		
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	12		
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	Roadside swale draining to detention basin
Existing attenuation -restricted discharge rate	l/s	No restriction	No restriction		
Existing settlement of sediments	%	0	0		
Proposed treatment for solubles	%	0	50	Description for proposed measures	
Proposed attenuation -restricted discharge rate	l/s	No restriction	3		
Proposed settlement of sediments	%	0	90		
EQ5, bio avail dissolved Cu	ug/l	1	1		
EQ5, bio avail dissolved Zn	ug/l	10.9	10.9		
Ambient background concentration, dissolved copper	ug/l	0	0		
Spillage Risk Assessments					
A MainRoad					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
B					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
C					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
D					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
E					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			

Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
F				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
Justification for choice of existing measures factors				
Justification for choice of proposed measures factors				
Groundwater Assessments				
Traffic flow	-	-		
Rainfall depth (annual averages)	-	-		
Drainage area ratio	-	-		
Infiltration method	-	-		
Unsaturated zone	-	-		
Flow type (Incorporates flow type an effective grain size)	-	-		
Unsaturated Zone Clay Content	-	-		
Organic Carbon	-	-		
Unsaturated zone soil pH	-	-		

Summary of predictions

Soluble - Acute Impact

Sediment - Chronic Impact

Prediction of impact	Step1
	Step2
	Step3

Copper	Zinc

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

Pond 7

In Runoff

Step 1

Step 1

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
1	1
67.90	62.20
89	75

Copper	Zinc
RST6	
1	1
21.70	25.30
28	29

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

27.32	84.71
52.94	172.88
68.76	255.14
113.86	446.19

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
Toxicity Threshold							
1	1	1	1	1	1	1	1
75.30	98.00	1.50	17.00	56.00	17.00	14.80	31.10
99	120	4	25	71	25	22	39

Toxicity Threshold	(mg/kg)	(mg/kg)	(mg/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
	197	315	3.5	16770	875	2355	245	515

349	1168	1	11065	1914	1837	117	518
786	2781	1	28184	4876	4679	299	1319
968	3569	2	56234	9729	9335	596	2632
1501	5477	4	112202	19411	18626	1189	5251

In River (no mitigation)

Step 2

Step 2

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
2	2
0	0
0	0
0	0
0	0

Copper	Zinc
RST6	
1	1
0	0
0	0
0	0
0	0

0.01	0.04
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.05	0.16
0.12	0.38
0.25	0.65
0.75	2.05

Velocity 0.01 m/s

Tier 1 is used for the calculation

DI 18.96

Minimum % settlement 0 %

In River (with mitigation)

Step 3

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
2	2
0.00	0.00
0	0
0	0
0	0

Copper	Zinc
RST6	
1	1
0.00	0.00
0	0
0	0
0	0

0.01	0.02
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.02	0.07
0.06	0.18
0.11	0.31
0.28	0.88

DI 1.90

Details of the chosen rainfall site

SAAR (mm) 820
Altitude (m) 25
Easting 3561
Northing 1754
Coastal distance (km) 10

Location Details

Road Number	A29 South of Barnham Road		Assessment type	Cumulative assessment including sediments (outfalls within 100m)		
HE Area/DBFO number			Receiving watercourse	Lidsey Rife		
OS grid reference of assessment point (m)	Eastings	494265	EA receiving water Detailed River Network ID	GB107041012010		
	Northing	103574	Assessor and affiliation	D Allum-Rooney BSc (Hons) MSc		
OS grid reference of outfall structure (m)	Eastings	494265	Date of assessment	08/06/2021		
	Northing	103574	Version of assessment	P01		
Outfall number	Pond 8					
List of outfalls in cumulative assessment	Pond 6		Pond 7	Pond 8	Pond 9	
Notes						

Parameter	Units	Default Value	Value used	Notes	
Runoff Risk Assessments					
AADT	vpd	>10,000 and <50,000	>10,000 and <50,000		
Climatic Region	-	Warm Dry	Warm Wet		
Rainfall Site	-	Ashford (SAAR 710mm)	Southampton (SAAR 820mm)		
Q95 River flow	m3/s	0	0.0837		
Baseflow Index	-	0.5	0.85		
Impermeable road area drained	ha	1	1.3288		
Permeable area draining to outfall	ha	0	0		
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	12		
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	Roadside swale draining to detention basin
Existing attenuation -restricted discharge rate	l/s	No restriction	No restriction		
Existing settlement of sediments	%	0	0		
Proposed treatment for solubles	%	0	50	Description for proposed measures	
Proposed attenuation -restricted discharge rate	l/s	No restriction	3.4		
Proposed settlement of sediments	%	0	90		
EQ5, bio avail dissolved Cu	ug/l	1	1		
EQ5, bio avail dissolved Zn	ug/l	10.9	10.9		
Ambient background concentration, dissolved copper	ug/l	0	0		
Spillage Risk Assessments					
A MainRoad					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
B					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
C					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
D					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
E					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			

Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
F				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
Justification for choice of existing measures factors				
Justification for choice of proposed measures factors				
Groundwater Assessments				
Traffic flow	-	-		
Rainfall depth (annual averages)	-	-		
Drainage area ratio	-	-		
Infiltration method	-	-		
Unsaturated zone	-	-		
Flow type (Incorporates flow type an effective grain size)	-	-		
Unsaturated Zone Clay Content	-	-		
Organic Carbon	-	-		
Unsaturated zone soil pH	-	-		

Summary of predictions

Soluble - Acute Impact

Sediment - Chronic Impact

Prediction of impact	Step1
	Step2
	Step3

Pond 8

Copper	Zinc

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

In Runoff

Step 1

Step 1

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
1	1
67.90	62.20
89	75

Copper	Zinc
RST6	
1	1
21.70	25.30
28	29

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

27.32	84.71
52.94	172.88
68.76	255.14
113.86	446.19

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
1	1	1	1	1	1	1	1
75.30	98.00	1.50	17.00	56.00	17.00	14.80	31.10
99	120	4	25	71	25	22	39

Toxicity Threshold	(mg/kg)	(mg/kg)	(mg/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)	(ug/kg)
	197	315	3.5	16770	875	2355	245	515

349	1168	1	11065	1914	1837	117	518
786	2781	1	28184	4876	4679	299	1319
968	3569	2	56234	9729	9335	596	2632
1501	5477	4	112202	19411	18626	1189	5251

In River (no mitigation)

Step 2

Step 2

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
2	2
0	0
0	0
0	0
0	0

Copper	Zinc
RST6	
1	1
0	0
0	0
0	0
0	0

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.05	0.16
0.12	0.38
0.25	0.65
0.75	2.05

Velocity 0.01 m/s

Tier 1 is used for the calculation

DI 18.96

Minimum % settlement 0 %

In River (with mitigation)

Step 3

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
2	2
0.00	0.00
0	0
0	0
0	0

Copper	Zinc
RST6	
1	1
0.00	0.00
0	0
0	0
0	0

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.02	0.07
0.06	0.19
0.12	0.31
0.28	0.89

DI 1.90

Details of the chosen rainfall site

SAAR (mm) 820
Altitude (m) 25
Easting 3561
Northing 1754
Coastal distance (km) 10

Location Details

Road Number	A29 South of Barnham Road		Assessment type	Cumulative assessment including sediments (outfalls within 100m)		
HE Area/DBFO number			Receiving watercourse	Lidsey Rife		
OS grid reference of assessment point (m)	Eastings	494292	EA receiving water Detailed River Network ID	GB107041012010		
	Northing	103270	Assessor and affiliation	D Allum-Rooney BSc (Hons) MSc		
OS grid reference of outfall structure (m)	Eastings	494292	Date of assessment	08/06/2021		
	Northing	103270	Version of assessment	P01		
Outfall number	Pond 9					
List of outfalls in cumulative assessment	Pond 6		Pond 7	Pond 8	Pond 9	
Notes						

Parameter	Units	Default Value	Value used	Notes	
Runoff Risk Assessments					
AADT	vpd	>10,000 and <50,000	>10,000 and <50,000		
Climatic Region	-	Warm Dry	Warm Wet		
Rainfall Site	-	Ashford (SAAR 710mm)	Southampton (SAAR 820mm)		
Q95 River flow	m3/s	0	0.0837		
Baseflow Index	-	0.5	0.85		
Impermeable road area drained	ha	1	1.3288		
Permeable area draining to outfall	ha	0	0		
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	12		
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	Roadside swale draining to detention basin
Existing attenuation -restricted discharge rate	l/s	No restriction	No restriction		
Existing settlement of sediments	%	0	0		
Proposed treatment for solubles	%	0	50	Description for proposed measures	
Proposed attenuation -restricted discharge rate	l/s	No restriction	5.1		
Proposed settlement of sediments	%	0	90		
EQ5, bio avail dissolved Cu	ug/l	1	1		
EQ5, bio avail dissolved Zn	ug/l	10.9	10.9		
Ambient background concentration, dissolved copper	ug/l	0	0		
Spillage Risk Assessments					
A MainRoad					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
B					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
C					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
D					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			
Junction type	-	-			
Location	-	-			
Traffic flow (AADT two way)	-	-			
% HGV	-	-			
Spillage factor	no/109H GVkm/year	-			
Existing measures factor	-	-			
Proposed measures factor	-	-			
E					
Water body type	-	-			
Length of road draining to outfall	m	-			
Road Type (A-road or Motorway)	-	-			
If A road, is site urban or rural?	-	-			

Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
F				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
Justification for choice of existing measures factors				
Justification for choice of proposed measures factors				
Groundwater Assessments				
Traffic flow	-	-		
Rainfall depth (annual averages)	-	-		
Drainage area ratio	-	-		
Infiltration method	-	-		
Unsaturated zone	-	-		
Flow type (Incorporates flow type an effective grain size)	-	-		
Unsaturated Zone Clay Content	-	-		
Organic Carbon	-	-		
Unsaturated zone soil pH	-	-		

Summary of predictions

Soluble - Acute Impact

Sediment - Chronic Impact

Prediction of impact	Step1
	Step2
	Step3

Pond 9

Copper	Zinc

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

In Runoff

Step 1

Step 1

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
1	1
67.90	62.20
89	75

Copper	Zinc
RST6	
1	1
21.70	25.30
28	29

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

27.32	84.71
52.94	172.88
68.76	255.14
113.86	446.19

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
1	1	1	1	1	1	1	1
75.30	98.00	1.50	17.00	56.00	17.00	14.80	31.10
99	120	4	25	71	25	22	39

	(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

349	1168	1	11065	1914	1837	117	518
786	2781	1	28184	4876	4679	299	1319
968	3569	2	56234	9729	9335	596	2632
1501	5477	4	112202	19411	18626	1189	5251

In River (no mitigation)

Step 2

Step 2

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
2	2
0	0
0	0
0	0
0	0

Copper	Zinc
RST6	
1	1
0	0
0	0
0	0
0	0

0.01	0.04
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.05	0.16
0.12	0.38
0.25	0.65
0.75	2.05

Velocity 0.01 m/s

Tier 1 is used for the calculation

DI 18.96

Minimum % settlement 0 %

In River (with mitigation)

Step 3

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
No. of exceedances/worst year
No. of exceedances/summer
No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
90%ile
95%ile
99%ile

Copper	Zinc
RST24	
2	2
0.00	0.00
0	0
0	0
0	0

Copper	Zinc
RST6	
1	1
0.00	0.00
0	0
0	0
0	0

0.01	0.02
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.02	0.08
0.06	0.19
0.12	0.32
0.32	0.95

DI 1.90

Details of the chosen rainfall site

SAAR (mm) 820
Altitude (m) 25
Easting 3561
Northing 1754
Coastal distance (km) 10

User parameters

Cumulative LR

Location Details

Road Number	A29 South of Barnham Road		Assessment type	Cumulative assessment including sediments (outfalls within 100m)		
HE Area/DBFO number			Receiving watercourse	Lidsey Rife		
OS grid reference of assessment point (m)	Eastings	494292	EA receiving water Detailed River Network ID	GB107041012010		
	Northing	103270	Assessor and affiliation	D Allum-Rooney BSc (Hons) MSc		
OS grid reference of outfall structure (m)	Eastings	494292	Date of assessment	08/06/2021		
	Northing	103270	Version of assessment	P01		
Outfall number	Cumulative		Pond 7	Pond 8	Pond 9	
List of outfalls in cumulative assessment	Pond 6					
Notes						

Parameter	Units	Default Value	Value used	Notes		
Runoff Risk Assessments						
AADT	vpd	>10,000 and <50,000	>=50,000 and <100,000			
Climatic Region	-	Warm Dry	Warm Wet			
Rainfall Site	-	Ashford (SAAR 710mm)	Southampton (SAAR 820mm)			
Q95 River flow	m3/s	0	0.0837			
Baseflow Index	-	0.5	0.85			
Impermeable road area drained	ha	1	1.3288			
Permeable area draining to outfall	ha	0	0			
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	12			
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	Roadside swale draining to detention basin	
Existing attenuation -restricted discharge rate	l/s	No restriction	No restriction			
Existing settlement of sediments	%	0	0	Description for proposed measures		
Proposed treatment for solubles	%	0	50			
Proposed attenuation -restricted discharge rate	l/s	No restriction	15.4	Description for proposed measures		
Proposed settlement of sediments	%	0	90			
EQ5, bio avail dissolved Cu	ug/l	1	1			
EQ5, bio avail dissolved Zn	ug/l	10.9	10.9			
Ambient background concentration, dissolved copper	ug/l	0	0			
Spillage Risk Assessments						
A MainRoad						
Water body type	-	-				
Length of road draining to outfall	m	-				
Road Type (A-road or Motorway)	-	-				
If A road, is site urban or rural?	-	-				
Junction type	-	-				
Location	-	-				
Traffic flow (AADT two way)	-	-				
% HGV	-	-				
Spillage factor	no/109H GVkm/year	-				
Existing measures factor	-	-				
Proposed measures factor	-	-				
B						
Water body type	-	-				
Length of road draining to outfall	m	-				
Road Type (A-road or Motorway)	-	-				
If A road, is site urban or rural?	-	-				
Junction type	-	-				
Location	-	-				
Traffic flow (AADT two way)	-	-				
% HGV	-	-				
Spillage factor	no/109H GVkm/year	-				
Existing measures factor	-	-				
Proposed measures factor	-	-				
C						
Water body type	-	-				
Length of road draining to outfall	m	-				
Road Type (A-road or Motorway)	-	-				
If A road, is site urban or rural?	-	-				
Junction type	-	-				
Location	-	-				
Traffic flow (AADT two way)	-	-				
% HGV	-	-				
Spillage factor	no/109H GVkm/year	-				
Existing measures factor	-	-				
Proposed measures factor	-	-				
D						
Water body type	-	-				
Length of road draining to outfall	m	-				
Road Type (A-road or Motorway)	-	-				
If A road, is site urban or rural?	-	-				
Junction type	-	-				
Location	-	-				
Traffic flow (AADT two way)	-	-				
% HGV	-	-				
Spillage factor	no/109H GVkm/year	-				
Existing measures factor	-	-				
Proposed measures factor	-	-				
E						
Water body type	-	-				
Length of road draining to outfall	m	-				
Road Type (A-road or Motorway)	-	-				
If A road, is site urban or rural?	-	-				

Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
F				
Water body type	-	-		
Length of road draining to outfall	m	-		
Road Type (A-road or Motorway)	-	-		
If A road, is site urban or rural?	-	-		
Junction type	-	-		
Location	-	-		
Traffic flow (AADT two way)	-	-		
% HGV	-	-		
Spillage factor	no/109H GVkm/y ear	-		
Existing measures factor	-	-		
Proposed measures factor	-	-		
Justification for choice of existing measures factors				
Justification for choice of proposed measures factors				
Groundwater Assessments				
Traffic flow	-	-		
Rainfall depth (annual averages)	-	-		
Drainage area ratio	-	-		
Infiltration method	-	-		
Unsaturated zone	-	-		
Flow type (Incorporates flow type an effective grain size)	-	-		
Unsaturated Zone Clay Content	-	-		
Organic Carbon	-	-		
Unsaturated zone soil pH	-	-		

Summary of predictions

Soluble - Acute Impact

Sediment - Chronic Impact

Prediction of impact	Step1
	Step2
	Step3

Cumulative LR

Copper	Zinc

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene

In Runoff

Step 1

Step 1

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year

Thresholds

Thresholds

Event Statistics Mean
 90%ile
 95%ile
 99%ile

Copper	Zinc
RST24	
1	1
79.10	77.10
98	95

Copper	Zinc
RST6	
1	1
32.10	37.10
44	43

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

33.20	106.50
64.34	217.34
83.57	320.76
138.39	560.94

Copper	Zinc	Cadmium	Total PAH	Pyrene	Fluoranthene	Anthracene	Phenanthrene
Toxicity Threshold							
1	1	1	1	1	1	1	1
86.80	113.20	1.60	17.00	56.00	17.00	14.80	31.10
114	141	4	25	71	25	22	39

	(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

419	1651	1	11065	1914	1837	117	518
924	3771	2	28184	4876	4679	299	1319
1128	4754	3	56234	9729	9335	596	2632
1722	7094	4	112202	19411	18626	1189	5251

In River (no mitigation)

Step 2

Step 2

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
 90%ile
 95%ile
 99%ile

Copper	Zinc
RST24	
2	2
0	0
0	0
0	0
0	0

Copper	Zinc
RST6	
1	1
0	0
0	0
0	0
0	0

0.01	0.05
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.06	0.20
0.14	0.47
0.30	0.82
0.92	2.58

Velocity m/s

Tier 1 is used for the calculation

DI Minimum % settlement %

In River (with mitigation)

Step 3

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Allowable Exceedances/year
No. of exceedances/year
 No. of exceedances/worst year
 No. of exceedances/summer
 No. of exceedances/worst summer

Annual average concentration (ug/l)

Thresholds

Thresholds

Event Statistics Mean
 90%ile
 95%ile
 99%ile

Copper	Zinc
RST24	
2	2
0.00	0.00
0	0
0	0
0	0

Copper	Zinc
RST6	
1	1
0.00	0.00
0	0
0	0
0	0

0.01	0.02
------	------

	(ug/l)	(ug/l)
RST24	21	60
RST6	42	120

0.03	0.10
0.07	0.24
0.15	0.41
0.46	1.29

DI

Details of the chosen rainfall site

SAAR (mm) 820
 Altitude (m) 25
 Easting 3561
 Northing 1754
 Coastal distance (km) 10