

## A68 Pathhead to Tynehead Junction Improvement Scheme

Figure 13.10

### Water Quality Prediction

Existing Road Configuration

04/10/2007

#### Salters Burn Cakemuir Burn

	µg/l	3.0	3.0
<b>E.O.S. Level - copper</b>		<b>15.0</b>	<b>15.0</b>
<b>E.O.S. Level - zinc</b>	µg/l	1.21	0.66
Area of road (A)	ha	0.5	0.5
Runoff Coefficient (R)		13	13
Rainfall Depth (D)	mm/d	0.0066	0.0310
$Q_{95}$	m <sup>3</sup> /s	0.0015	0.0015
$C_B$ - copper - upstream	kg/m <sup>3</sup>	0.0075	0.0075
$C_B$ - zinc - upstream	kg/m <sup>3</sup>		

Data from S.E.P.A.
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7.3m wide road *
Section A.3.ii, Annex 1, Part 10, DMRB Vol. 11.
Figure A.1, Annex 1, Part 10, DMRB Vol. 11.
Data from S.E.P.A. on Salters & Cakemuir Burn
Based on Leader Water Data of same river quality
Based on Leader Water Data of same river quality

Runoff Volume ( $V_H$ )	m <sup>3</sup> /day	78.8	42.7
$Q_{95}$ ( $V_R$ )	m <sup>3</sup> /day	570.2	2678.4

Runoff Volume = $(A \times R \times D / 1000) \times 10000$
95 percentile flow m <sup>3</sup> /day ( $Q_{95} \times 3600$ seconds x 24hrs)

<b>Dilution</b>		<b>7</b>	<b>63</b>
<b>AADT</b>	veh/day	<b>12,800</b>	<b>12,800</b>

$(V_R / V_H)$ - Section A3 (iv), Annex 1, HA 216/06.
From Stage 3 Traffic & Economic Assessment - Design Year (2024) Flows

Build up rate - Copper	kg/ha/yr	0.3	0.3
Build up rate - Zinc	kg/ha/yr	1.0	1.0

Table B.1, Annex 1, Part 10, DMRB Vol. 11.
Table B.1, Annex 1, Part 10, DMRB Vol. 11.

$M_{Cu}$	kg/5day	0.0050	0.0027
$C_R$ - soluble copper	kg/m <sup>3</sup>	0.0090	0.0025
<b><math>C_R</math> - soluble copper</b>	µg/l	<b>9.0</b>	<b>2.5</b>

Five day Pollutant build-up Copper
$CR = \{(C_B \times V_R) + (1000 \times M)\} / (V_R + V_H)$
Down stream river concentration of copper in micrograms per litre µg/l

$M_{Zn}$	kg/5day	0.017	0.009
Cr - zinc	kg/m <sup>3</sup>	0.032	0.011
<b>Cr - zinc</b>	µg/l	<b>32.2</b>	<b>10.7</b>

Five day Pollutant build-up Zinc
$CR = \{(C_B \times V_R) + (1000 \times M)\} / (V_R + V_H)$
Down stream river concentration of zinc in micrograms per litre µg/l

\* Area of road drained into Salters Burn =  $\{(Ch0 + 40 \text{ to } Ch17 + 00) \times 7.3m\} / 10,000m^2$

\* Area of road drained into Cakemuir Burn =  $\{(Ch17 + 00 \text{ to } Ch26 + 00) \times 7.3m\} / 10,000m^2$