Scottish & Southern Electricity Networks

TRANSMISSION

Emmock 400kV Substation Environmental Impact Assessment (EIA) Volume 4 | Appendix 11.2

Watercourse Crossing and Buffers Assessment

November 2024

Scottish & Southern Electricity Networks

TRANSMISSION

CONTENTS

LIST OF ABBREVIATIONS

EIA – Environmental Impact Assessment
LUC – Land Use Consultants ltd.
SEPA – Scottish Environment Protection Agency
SuDS – Sustainable Drainage Systems

1. INTRODUCTION

1.1.1 This appendix presents information on proposed engineering activities in the water environment or close to the water environment for the Proposed Emmock Substation. It should be read in conjunction with **Chapter 11: Hydrology and Hydrogeology** and **Chapter 3: Development of the Proposed Development (Volume 2)** of the **EIA Report** for full details of the Proposed Development.

1.1.2 This appendix is supported by the following figure:

- Figure 11.2.1: Proposed watercourse crossing and watercourse buffers

2. WATERCOURSE CROSSINGS AND BUFFERS

2.1.1 New watercourse crossings were avoided as much as possible in the design and existing tracks were utilised where possible. **Table 11.1: Watercourse Crossings and Watercourses where a 50 m buffer to infrastructure was not achieved** presents data on proposed watercourse crossings that will be utilised for the Proposed Development. There is one proposed watercourse crossing (see **Figure 11.2.1: Proposed watercourse crossing and watercourse buffers**) and no existing crossings.

2.1.2 The Scottish Environment Protection Agency (SEPA) recommended a buffer of 50 m around each waterbody/watercourse in their scoping response (SEPA Letter, 31 July 2024). This was achieved for most of the Proposed Development, with the exception of four locations, one of which is the watercourse crossing. The 50 m buffer from watercourses is shown in **Figure 11.2.1: Proposed watercourse crossing and watercourse buffers with areas where the 50 m buffer could not be achieved** labelled A to D, where A is the proposed access track crossing. Locations A to D are described and assessed in detail in **Table 1.1**.

2.1.3 SEPA (2024[1]) has recently published guidance on recommended riparian corridors that allow space for natural fluvial processes to occur in riparian areas (as well as other attendant environmental benefits including biodiversity, open space, channel maintenance opportunities, pollution reduction and river restoration). The guidance recommends a minimum riparian corridor width of 10 to 30 m from bank top along both banks of all watercourses dependant on channel width, as below. It is important to highlight that buffer strips do not mitigate any identified flood risk that may exist at a site.

Channel width	***Recommended buffer (each side of channel)***
<2 m	*10 m*
2 – 15 m	*15 m*
>15 m	*30 m*

2.1.4 Based on the recommended riparian corridors and the channel widths of the nearby watercourses (all of which are no greater than 3 m wide), all of the advised recommended riparian corridor buffers have been achieved for the Proposed Development.

[1] SEPA (2024) Recommended Riparian Corridor Layer for use in Land Use Planning, https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.sepa.org.uk%2Fmedia%2Fpuqhuwhn%2Frecommended-riparian-corridor-note.docx&wdOrigin=BROWSELINK

Table 11.1 Watercourse Crossings and Watercourses where a 50 m buffer to infrastructure was not achieved

ID – A **(Proposed watercourse crossing of access track)**	**Unnamed Tributary of Fithie Burn**
Description: At the proposed crossing location, the channel is culverted in a 700mm culvert beneath the field. It is not a surface water feature at the crossing location during normal flow conditions. The topography through the field is lower in the centre and shaped like a natural valley. During flood flows there is an overland flow path through the field. At the crossing location the predicted 200-year plus climate change floodplain is ~21 m wide (see **Appendix 11.1** Flood Risk Assessment for further details).	
NGR Ref: 737963 339465	
Photo – Field upstream of crossing location	Photo – Tributary becomes an open channel downstream of Site. This is ~220 m downstrem of the crossing location.
	
Width of watercourse (m)	n/a, as the watercourse at crossing location is culverted beneath the field in a 700 mm culvert
Bed Sediment	n/a as watercourse culverted at crossing location
Bank Erosion	n/a as watercourse culverted at crossing location; there was some bank erosion observed ~220 m downstream of the crossing location (see photo above)
Natural Channel	No
Crossing Type	Proposed permanent access track. The crossing has been designed to pass the 200-year plus climate change flood flow via by-pass culverts. The crossing crosses the floodplain at the narrowest point (~21 m wide).
Catchment (km^2)	4.08 km^2 (note: this includes the upper catchment of the Tealing Burn, which overtops its bank and flows overland to the tributary catchment during flood events)
Minor Watercourse[2]	Yes
CAR Authorisation Required	No, based on the fact that it is defined as a minor watercourse. The Applicant will liaise with SEPA to see if CAR authorisation is required.

[2] A minor watercourse is defined by SEPA as one that is not shown on 1:50,000 scale Ordnance Survey maps. SEPA do not normally require an authorisation for engineering activities on minor watercourses with the exception of culverting for land-gain, dredging and permanent diversions/realignments.

ID – B **(50 m buffer to infrastructure was not achieved)**	**Unnamed Drain**
Watercourse Description: The small drain runs adjacent to a field boundary and is not a watercourse. The drain issues from a field drain pipe (of 250 mm diameter) and enters the unnamed tributary downstream of the Site boundary.	
NGR Ref: 737723 339344	
Photo – Drain looking upstream to where it issues from the piped field drain	Photo – Drain
	
Width of watercourse/ drain (m)	~ 0.7 m Drain issues from a 250 mm field drainage culvert.
Infrastructure and Ancillary Works Description	Raised bund (for landscaping) - permanent Access track - permanent Construction compound – temporary
Width of buffer strip achieved	23 m (to base of bund) 25 m (to access track) 37 m (to temp construction compound)
Water feature upgradient or downgradient of Proposed Development	Downgradient
Potential Effect/ Comment	Flow path analysis indicates that surface water runoff paths are from the infrastructure towards the drain. Embedded and Applied Mitigation (i.e. construction and permanent SuDS) will be included in the design. Surface water runoff will be treated and attenuated. Buffer width is considered adequate for size of water feature. Based on SEPA's recommended riparian corridors a drain of this width would require a buffer of 10 m either side, which has been achieved.
Additional Mitigation	Consider additional SuDS (e.g. silt fences, settlement ponds) at this location.

ID – C (50 m buffer to infrastructure was not achieved)	Fithie Burn
Watercourse Description: The Fithie Burn is approximately 1.1 m wide at this location, with banks heights of between 1.4 and 1.6m. There is a wooden fence across the watercourse close to the right-angled bend. The watercourse has been artificially straightened historically. The flood risk assessment (**Appendix 11.1**) predicts some overbank flooding at this location.	
NGR Ref: 737451 338570	
Photo – Fithie Burn on left of photo, at location of ~right-angled bend. Note low, wet ground on north side of watercourse	Photo – Fithie Burn, just downtream of bend
	
Width of watercourse/ drain (m)	1.1 m
Infrastructure and Ancillary Works Description	Substation platform – permanent Earthworks - temporary Landscape bunds – permanent
Width of buffer strip achieved	45 m (to substation platform) 32 m (to earthworks) 35 m (to landscape bunds)
Water feature upgradient or downgradient of Proposed Development	Downgradient
Potential Effect/ Comment	Flow path analysis indicates that surface water runoff paths are from the infrastructure towards the drain. Embedded and Applied Mitigation (i.e. construction and permanent SuDS) will be included in the design. Surface water runoff will be treated and attenuated. All infrastructure is outwith the 200-year plus climate change floodplain and the buffer width achieved is considered adequate for size of water feature. Based on SEPA's recommended riparian corridors a watercourse of this width would require a buffer of 10 m either side and the Proposed Development should be outwith the flood risk area.
Additional Mitigation	Consider additional SuDS (e.g. silt fences, settlement ponds) at this location.

ID – D **(50 m buffer to infrastructure was not achieved)**	**Fithie Burn**
Watercourse Description: The Fithie Burn is approximately 2.8 m wide at this location. The watercourse has been artificially straightened historically. The flood risk assessment (**Appendix 11.1**) predicts overbank flooding at this location.	
NGR Ref: 737230 338768	
Photo – Fithie Burn	Photo – Fithie Burn
	
Width of watercourse/ drain (m)	2.8 m
Infrastructure and Ancillary Works Description	SuDS drainage outfall – permanent
Width of buffer strip achieved	0 m (the outfall SuDS drainage will enter the burn via a piped outfall)
Water feature upgradient or downgradient of Proposed Development	Upgradient
Potential Effect/ Comment	The discharge will require authorisation under the CAR Regulations prior to construction. It is noted that there are no SuDS (for attenuation or treatment) within the floodplain; the part within the floodplain is for conveyance only to the discharge point. Any effects of installation of the piped outlet will be temporary and of minor magnitude. There will be no modification to the bed of the channel and the banks will be restored following construction.
Additional Mitigation	Additional pollution control measures during installation of the outfall. This will need authorisation under CAR in advance of construction and additional mitigation will be agreed with SEPA in advance of the works.

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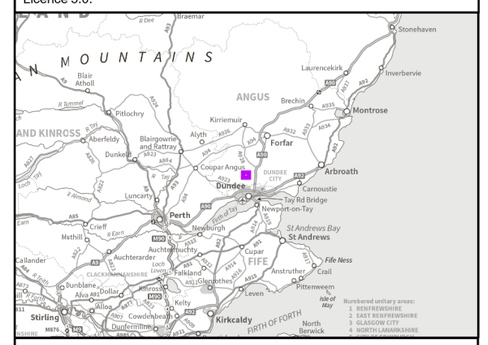
LUC

Stone Circle (remains of)
Gamekeepers Cottage
Dams
Track
Sks
165m
191m
Hillview House
Dunian
177m
171m
181m
164m
156m
154m
Wind Turbine
Balkemback Farmhouse
Cross Roads Cottage
A
145m
Balnuith Farm
ESS
Wind Turbine
Track
Wind Farm
Wind Turbine
B
Tributary of the Fithie Burn
Drain
130m
Track
Iss
C
Fithie Burn
Iss
Sks
Fithie Burn
D
Wynton Wood
Drain
Track
141m
Wynton Works
125m
Drain
N
Scale @ A3: 1:6,000
km
0
0.25
0.5

- Emmock red line boundary
- Substation fence line
- Electrical layout
- OS surface watercourses and waterbodies
- Surface water 50m buffer
- Watercourse crossings and watercourse buffers



Project No: LT382

Project: Emmock 400 kV Substation

Title:

Proposed watercourse crossing and watercourse buffers

Drawn by: IB

Date: 11/11/2024

Figure: 11.2.1