Scottish & Southern Electricity Networks

TRANSMISSION

Hurlie 400kV Substation Environmental Impact Assessment (EIA) Volume 4 | Appendix 12.2

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 Hurlie Substation. It should be read in conjunction with **Chapter 12: 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 12.1: Hydrology and Hydrogeology Study Area, showing watercourse crossing and watercourse buffers (Volume 3 of this EIA Report)

2. WATERCOURSE CROSSINGS AND BUFFERS

2.1.1 Existing forest tracks will be used to access the Proposed Development and no new watercourse crossings are proposed. A land drain in the southwest of the Site may need a new crossing, as it will be crossed by a new temporary construction track. The existing tracks have existing culverts/bridges at the watercourse crossings and no upgrades to existing crossings are required. **Table 1: Watercourse Crossings** presents data on the fourteen existing watercourse crossings and the new drain crossing that will be utilised for the Proposed Development and their locations are shown in **Figure 12.1: Hydrology and Hydrogeology Study Area** in the EIA Report. An overbridging system will be used for one crossing (Crossing H – Cowie Water) for passing abnormal loads during construction (see **Table 1** for details).

2.1.2 During the initial design stage, elements of the Proposed Development were located to achieve a minimum 50 m from nearby watercourses, based on early guidance from the Scottish Environment Protection Agency (June 2023). Following later consultation with Aberdeenshire Council/ SEPA (May 2024) a 15 m minimum buffer from watercourses was recommended (**Table 12.1: Summary of Consultation in the EIA Report**). Therefore, apart from the exceptions below, which are mainly watercourse crossings, one new crossing and one buffer breach (labelled A-O on **Figure 12.1**), all infrastructure is at least 15 m away from watercourses and water features.

2.1.3 A 15 m buffer is provided for in the design of the Proposed Development, with the exception of the fifteen locations described in **Table 1**. The 15 m buffer from watercourses is shown in **Figure 12.1**. Locations A to 0 are described and assessed in detail in **Table 1**.

2.1.4 SEPA (2024[1]) has updated their recommended minimum buffers as per their 'recommended riparian corridor' buffer for Overhead Line (OHL) projects as below:

The recommended riparian corridor width has been scaled to channel width, to reduce land take whilst still ensuring the benefits of the riparian corridor are realised. The recommended minimum corridor widths for each bank are provided below:

Channel width	***Recommended corridor width on each channel bank***
< 2 m	*10 m*
2 - 15m	*15 m*
> 15 m	*30 m*

2.1.5 Based on the recommended riparian corridors and the channel widths of the nearby watercourses (all of which are no greater than ~5 m wide), all of the advised recommended riparian corridor buffers are achieved for the Proposed Development.

[1] SEPA (2024) Recommended Riparian Corridor Layer for use in Land Use Planning, July 2024. Available online: 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 1: Watercourse Crossings

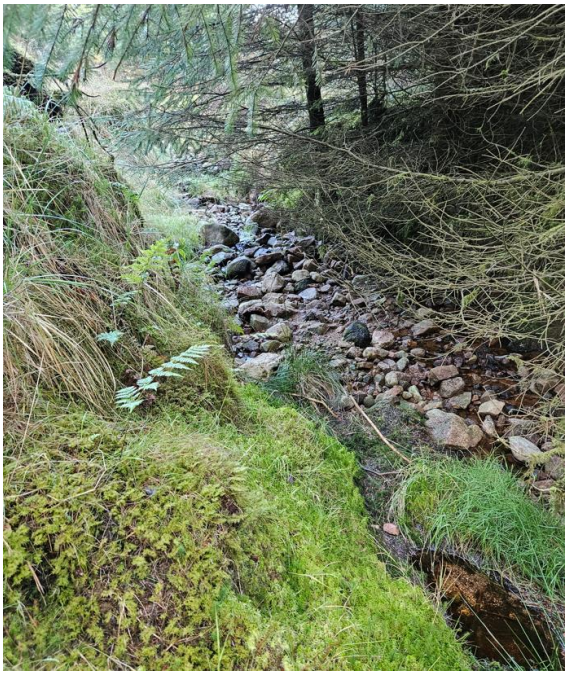
ID – A (Existing track crossing)	**Black Burn**
Description: At the crossing location, the Black Burn is crossed by an existing large bridge crossing in a ~2.4 m wide channel.	
NGR Ref: 378949 789314	
Photo – Black Burn looking downstream 	Photo – Black Burn looking upstream from crossing 
Width of watercourse (m)	2.4 m
Bed Sediment	Mix of pebble and cobble
Bank Erosion	Yes some bank erosion observed near crossing
Natural Channel	Yes
Crossing Type	Existing Bridge – no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	7.85 km^2
Minor Watercourse[2]	No
CAR Authorisation Required	No

[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 (Existing track crossing)	Unnamed Drain
Watercourse Description: The small drain flows southeast and is culverted beneath the existing access track. The drain was dry at the time of the site visit and the culvert was not visible. The drain was clearly heavily modified by forestry.	
NGR Ref: 378602 789396	
Photo – dry drain upstream of track	Photo – dry drain downstream of track
	
Width of watercourse/ drain (m)	Estimated ~ 0.9 m
Bed Sediment	Vegetated Channel (no flow at time of site visit)
Bank Erosion	No
Natural Channel	No
Crossing Type	Existing Culvert (not observed as likely deep under the existing track) – no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.1 km^2
Minor Watercourse	Yes
CAR Authorisation Required	No

ID – C (Existing track crossing)	Unnamed Watercourse
Watercourse Description: Small unnamed burn flows beneath existing track to the south and is culverted under the track. A Private Water Supply (PWS) offtake and tank was observed approximately 30 m downstream of the existing track crossing. It is assumed that this is the PWS for the Tillybreak property.	
NGR Ref: 378268 788409	
Photo – watercourse/ culvert looking upstream from track	Photo – watercourse looking downstream from track
	
Width of watercourse/ drain (m)	~0.2 – 0.4 m
Bed Sediment	Mixed sediment
Bank Erosion	No
Natural Channel	Yes
Crossing Type	Existing Culvert (400 mm diameter)– no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.14 km^2
Minor Watercourse	Yes
CAR Authorisation Required	No

ID – D (Existing track crossing)	Unnamed Drain
Watercourse Description: Small unnamed forestry drain which flows beneath existing track in a 500 mm diameter culvert.	
NGR Ref: 378211 788385	
Photo – upstream of track	
	
Width of watercourse/ drain (m)	~0.3 m
Bed Sediment	Mixed
Bank Erosion	No
Natural Channel	No
Crossing Type	Existing Culvert (500 mm diameter)– no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.05 km^2
Minor Watercourse	Yes
CAR Authorisation Required	No

ID – E (Existing track crossing)	Irish Burn
Watercourse Description: Irish Burn flows beneath existing track, as a natural gravel and cobble bed channel with 1000 mm diameter culvert under the track.	
NGR Ref: 377110 788249	
Photo – Irish burn (upstream of track)	Photo – Irish burn (culvert - downstream of track)
	
Width of watercourse/ drain (m)	1.3 m
Bed Sediment	Gravel, cobble, boulder
Bank Erosion	No
Natural Channel	Yes
Crossing Type	Existing culvert (1000 mm diameter) – no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.53 km^2
Minor Watercourse	No
CAR Authorisation Required	No

ID – F (Existing track crossing)	East Dumer Burn
Watercourse Description: East Dumer Burn flows beneath existing track through a 2000 mm diameter culvert.	
NGR Ref: 376585 787919	
Photo – East Dumer Burn – upstream of the track	East Dumer Burn – downstream of the track
	
Width of watercourse/ drain (m)	1.7 m
Bed Sediment	Gravel, cobble and boulder
Bank Erosion	No
Natural Channel	Yes
Crossing Type	Existing culvert (2000 mm) – no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	1.77 km^2
Minor Watercourse	No
CAR Authorisation Required	No

ID – G (Existing track crossing)	West Dumer Burn
Watercourse Description: West Dumer Burn flows beneath existing track via a 1000 mm diameter culvert	
NGR Ref: 376548 787859	
Photo – West Dumer Burn - upstream of the track	West Dumer Burn - downstream of the track
	
Width of watercourse/ drain (m)	1.3 m
Bed Sediment	Pebble, gravel
Bank Erosion	No
Natural Channel	Yes
Crossing Type	Existing culvert (1000 mm) – no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	1.35 km^2
Minor Watercourse	No
CAR Authorisation Required	No

ID – H (Existing track crossing)	Cowie Water
Watercourse Description: Cowie Water flows beneath existing single span bridge crossing. SEPA future flood mapping indicates that the 200-year + climate change floodplain at the crossing location is approximately 70m wide, indicating that some of the nearby tracks will have some floodwater during extreme events.	
NGR Ref: 376448 787359	
Photo – Cowie Water – looking upstream from bridge crossing	Cowie Water – bridge - looking downstream
	
Width of watercourse/ drain (m)	2.9 m Bridge deck is 2.2m high above channel bed and 6m wide
Bed Sediment	Cobble, boulder
Bank Erosion	No
Natural Channel	Yes
Crossing Type	Single span bridge– no upgrade proposed. An overbridging system is proposed at this crossing to allow passing of abnormal loads during the construction phase. This is a temporary 'overbridge' which will sit on the deck of the existing bridge/track. There will be no work in the watercourse and no impact to the bed and bank.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	13.2 km^2
Minor Watercourse	No
CAR Authorisation Required	No

ID – I (Existing track crossing)	Whiting Burn
Watercourse Description: Whiting Burn flows beneath existing track bridge via a 300 mm culvert crossing to the south.	
NGR Ref: 378532 786105	
Photo – Whiting Burn – upstream of track crossing	Photo – Whiting Burn – from track
	
Width of watercourse/ drain (m)	0.4 m
Bed Sediment	Silt
Bank Erosion	No
Natural Channel	Yes
Crossing Type	Existing culvert (300 mm) – no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.41 km^2
Minor Watercourse	Yes
CAR Authorisation Required	No

ID – J (Existing track crossing)	Burn of Elfhill
Watercourse Description: Burn of Elfhill flows beneath existing track crossing to the south, culvert dimensions unknown.	
NGR Ref: 379042 786220	
Photo –	Photo –
	
Width of watercourse/ drain (m)	0.4 m
Bed Sediment	Pebble
Bank Erosion	No
Natural Channel	Yes
Crossing Type	Existing culvert – no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.36 km^2
Minor Watercourse	Yes
CAR Authorisation Required	No

ID – K (Existing track crossing)	Burn of Elfhill
Watercourse Description: Burn of Elfhill flows beneath existing track crossing to the south. There is an existing culvert, but culvert dimensions are unknown at the time of writing. This crossing is on the Burn of Elfhill and is approximately 300 m downstream from crossing J. There was no access to crossing K at the time of writing.	
NGR Ref: 379197 785944	
Photo – Burn of Elfhill (from Bing aerial imagery)	
	
Width of watercourse/ drain (m)	Estimated ~ 0.5 m
Bed Sediment	Unknown – likely mixed/pebble
Bank Erosion	-
Natural Channel	Yes
Crossing Type	Existing culvert (dimensions unknown) – no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.60 km^2
Minor Watercourse	No
CAR Authorisation Required	No

ID – L (New temporary construction track crossing)	Unnamed Drain
Watercourse Description: Crossing L is over a land drain (as mapped on Ordnance Survey 1:10,000 mapping). There was no access to crossing L at the time of writing and it is not known if it is present on Site. During detailed design this drain will be considered and either the construction haul route will be locally realigned if necessary, or a new culvert included for the drain.	
NGR Ref: 379983 785960	
Photo – Unnamed Drain (from Bing aerial imagery)	
	
Width of watercourse/ drain (m)	Estimated ~ 0.2 m
Bed Sediment	Unknown
Bank Erosion	-
Natural Channel	No
Crossing Type	New culvert crossing required for temporary construction track
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.10 km^2
Minor Watercourse	Yes
CAR Authorisation Required	No

ID – M (Existing track crossing)	Unnamed Drain
Watercourse Description: Crossing M is over a land drain (as mapped on Ordnance Survey 1:10,000 mapping). There was no access to crossing M at the time of writing and it is not known if it is present on Site. If this existing access route is to be used to access the Proposed Development, there will be an existing culvert and its suitability will be assessed at detailed design stage.	
NGR Ref: 380265 786055	
Photo – Unnamed Drain (from Bing aerial imagery)	
	
Width of watercourse/ drain (m)	Estimated ~ 0.2 m
Bed Sediment	Unknown
Bank Erosion	-
Natural Channel	No
Crossing Type	Existing culvert (dimensions unknown)
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.17 km^2
Minor Watercourse	Yes
CAR Authorisation Required	No

ID – N (Existing track crossing and 15 m watercourse buffer breach of temporary construction track)	Burn of Baulks
Watercourse Description: Crossing N is an existing track crossing of the upper burn of Baulks, which flows to the east. There was no access to crossing N at the time of writing. If this existing access route is to be used to access the Proposed Development, there will be an existing culvert and its suitability will be assessed at detailed design stage. The temporary construction access track maintains a buffer of 10 m from the line of the upper Burn of Baulks, which is the recommended buffer size based on the watercourse size at this location. However, it is noted that the track can be locally micro-sited to achieve a 15 m buffer at next phase of design, if required. The principal design consideration was to achieve a 1:8 gradient, and the temporary construction route is indicative only at this stage.	
NGR Ref: 380199 786132	
Photo – Upper Burn of Baulks (from Bing aerial imagery)	
	
Width of watercourse/ drain (m)	Estimated ~ 0.5 m
Bed Sediment	Unknown
Bank Erosion	-
Natural Channel	Yes
Crossing Type	Existing culvert (dimensions unknown)
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.5 km^2
Minor Watercourse	Yes
CAR Authorisation Required	No

ID – 0 (Existing track crossing)	Burn of Day
Watercourse Description: Burn of Day flows beneath existing track crossing to the east, culvert dimensions unknown.	
NGR Ref: 379998 786787	
Photo – Burn of Day looking upstream	Photo – Burn of Day looking downstream
	
Width of watercourse/ drain (m)	0.6 m
Bed Sediment	Pebble
Bank Erosion	No
Natural Channel	Yes
Crossing Type	Existing culvert (dimensions unknown) – no upgrade proposed.
Additional Mitigation	Additional SuDS and pollution control measures (e.g. silt fences) at this location during construction phase.
Catchment (km^2)	0.8 km^2
Minor Watercourse	No
CAR Authorisation Required	No