

Appendix 7.5: Watercourse Crossing Inventory

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Introduction

1.1 This appendix should be read in conjunction with EIA Report Chapter 7: Geology, Hydrology, Hydrogeology and Peat and Figures 7.6a-d and Chapter 4: Project Description.

Hydrological Context

1.2 The majority of the Site drains via unnamed watercourses and lochans to Allt Seanabhaile and Loch Meiklie to the north, which flow to the River Enrick. The River Enrick discharges to Loch Ness at Drumnadrochit. A small section of the Site in the south-east drains via unnamed watercourses and Loch nam Meur to the River Coiltie, which also discharges to Loch Ness at Drumnadrochit. A minor area south-west of the Site drains via Loch a' Chrathaich to Allt Loch a Chrathaich and then to Allt Bhlaraidh, which flows into the River Moriston and then discharges to Loch Ness at Invermoriston. The existing access track falls within the Loch a' Chrathaich to Allt Loch a Chrathaich catchment and the River Moriston Catchment. Loch Ness receives all site waters and drains north to the River Ness and discharges to the North Sea at Inverness. The River Enrick, River Coiltie, Loch a' Chrathaich and Allt Bhlaraidh are all part of the Loch Ness and River Ness catchment.

1.3 The River Enrick headwaters, prior to Loch Meiklie, is classified as Moderate overall condition by SEPA mainly due to pressures on water flows and levels from water abstraction for hydroelectricity generation and are High for fish migration access, water quality and free from of invasive species. The stretch of the River Enrick from Loch Meiklie to Loch Ness is classified as Poor overall condition due to a barrier for fish migration by a crossing of the watercourse due to be addressed between 2021 and 2027. Water quality and physical condition are otherwise good or high.

1.4 The River Coiltie is classified as Poor overall condition by SEPA due to a barrier for fish migration by a crossing of the watercourse and water abstraction for hydroelectricity generation. Water quality and physical condition are otherwise classified as high.

1.5 Loch a Chrathaich is a lake 0.8km² in area and classified as of Good overall Condition by SEPA with high access for fish migration, free from invasive species and for water flows and levels.

1.6 Allt Bhlaraidh is classified as Bad overall condition by SEPA mainly due to pressures on water flows and levels from water abstraction for hydroelectricity generation due to be addressed between 2015 and 2021, and due to Poor Ecological Condition caused by unknown pressure on water animals and plants. Water quality, physical condition and access for fish migration are otherwise classified as high.

1.7 The River Moriston is classified as Good overall condition by SEPA and is a designated Special Area of Conservation (SAC) primarily due to its supporting a freshwater pearl mussel (FWPM) population, and secondarily because of the presence of Atlantic Salmon.

Legislative Context

1.8 The water environment includes wetlands, rivers, lochs, transitional waters (estuaries), coastal waters and groundwater. The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (known as CAR) (Version 9.2 as amended in December 2022), specify that it is an offence to undertake the following activities without a CAR authorisation:

- Discharges to all wetlands, surface waters and groundwater (replacing the Control of Pollution Act 1974 (CoPA));
- Disposal to land (replacing the Groundwater Regulations 1998);
- Abstractions from all wetlands, surface waters and groundwaters;
- Impoundments (dams and weirs) of rivers, lochs, wetlands and transitional waters; and
- Engineering works in inland waters and wetlands.

1.9 Watercourse crossings (engineering works in inland waters and wetlands) comes under Section 6 of CAR. Three different types of authorisation under CAR allow for proportionate and risk-based regulation. The authorisation process operates at three levels which are:

- General Binding Rules;
- Registrations; and
- Licences.

1.10 These levels cover activities with increasing potential impact upon the environment. Minor watercourses, which do not feature on the 1:50,000 scale Ordnance Survey mapping, are not within the remit of CAR regulations for track crossings. However, these minor watercourse crossings have been considered within this Appendix.

1.11 It will be the objective of the Applicant to ensure that all activities remain within the General Binding Rules (Engineering Activities) identified in The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide, Version 9.2, December 2022 (SEPA, 2022). The applicable Engineering Activities General Binding Rules (GBR) and Registrations that this application shall adhere to are as follows:

- General Binding Rule 6 – Minor bridges with no construction on bed or banks;
- General Binding Rule 8 – Controlling bank erosion by green bank reinforcement or re-profiling;
- General Binding Rule 9 – Operating any vehicle, plant or equipment (machinery) when undertaking other GBR activities (which includes GBR 6 and 8).
- Registration – Bridges with no construction on bed and <20m of total bank affected (open-based culverts would be anticipated to fall within this category);
- Registration – Where cables are not appropriately located to cross water channels via newly installed track infrastructure, it would be anticipated a Registration would be required, as cables would be anticipated being installed via isolated open-cut technique, due to small channel size; and
- Simple Licence – for all other bridges, fords and causeways, such as those with construction on bed and greater than 20m of total bank affected. Larger culverts may fall within this category.

1.12 Should activities be determined to be outwith the above GBR and Registration authorisations, it would be appropriate to consider a licence application (simple or complex). The SEPA Regulatory Methods for Engineering Activities (SEPA, 2019) lists conservation, environmental standards for morphology and good practice as tests for any licence application. During the determination, SEPA shall consider the specific location, type, size and existing water quality of the local water features.

1.13 A Construction Site Licence is anticipated to be required, in accordance with the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (amended 2022). This application process shall be undertaken pre-construction, providing supplementary information to that available at the EIA Report stage.

1.14 A large and complex construction project licence authorisation from SEPA will be required as it is a development project that undertakes one or more "controlled activity" including the discharge of water run-off from a construction site to the water environment), has greater than 5km new track and is "an onshore electricity generating station, wind farm or power station with a capacity of greater than 50megawatts".

1.15 The SEPA large and complex construction project licence must be applied for and be granted before the activity can take place.

Desk Study

1.16 The desk study consisted of a review of the information regarding the Proposed Development, principally involving an examination of the proposed track layout and the identification of watercourses marked on the OS 1:50,000 scale map which would require crossings, under the CAR Regulations. Crossings of minor watercourses were also identified at OS 1:25,000 scale mapping, where possible. This information informed the design to minimise crossing locations of all mapped watercourses.

Walkover Surveys

1.17 Subsequent to the initial desk study, walkover surveys of the Site were conducted on 30th November to 3rd December 2021 and 29th to 30th June to 2022, during which the identified crossings were visited to obtain specific information about each location. Photographs and detailed field notes were taken reporting channel and valley dimensions, average bed width, bed substrate, and type of either the existing or proposed crossing. A hand-held GPS unit was used to obtain locations with greater than 5m accuracy.

Ecological Provision

1.18 For each crossing, there is provision to indicate the likelihood of the watercourse being used by mammals, principally otters, water vole, and fish migration. Where mammal or migratory fish presence is confirmed or suspected, appropriate design features will be included within the crossing design. These may include incorporation of ledges or additional dry passages to allow passage at high water levels, in-channel baffles or low water channels to aid fish passage, and other design features appropriate for the crossing location. Track design has considered good practice guidance and recommendations in the Design Manual for Roads and Bridges (Highways Agency, 2020).

Hydrological Buffers

1.19 A 50m hydrological buffer has been applied to all infrastructure except where watercourse crossings are required, with track construction minimised within this buffer, excepting the following locations:

- T6 temporary crane hardstanding (70m² area located within the buffer);
- T8 crane hardstanding (33m² area located within the buffer);
- Met mast base (35m² area located within the buffer).

1.20 The Proposed Development infrastructure in relation to the main watercourses and waterbodies and their 50m buffers is shown in **Figure 7.6a to 7.6d**.

Watercourse Crossings

1.21 A total of nine new watercourse crossings will be constructed for the Proposed Development. Of these, six are watercourse crossings of watercourses shown on the 1:50,000 scale OS Mapping and two are of watercourses shown on the 1:25,000 scale OS mapping (minor crossings). One crossing is of a part of a watercourse not shown on either 1:50,000 or 1:25,000 scale OS maps but is immediately upstream of a watercourse shown on a 1:25,000 scale map and following site inspection is considered as a 1:25,000scale OS map watercourse.

1.22 There are an additional seven crossings over small drains not shown on either 1:50,000 or 1:25000 scale maps. It should be noted that based on onsite observations all of the 1:50,000 scale are considered to be a minor crossings due to their small size.




1.23 All proposed watercourse crossings are listed in **Table 1 and 2** and shown on **Figure 7.6a to 7.6d**. Drain crossings are shown on **Figure 7.6a to 7.6d**, with some typical examples shown in **Table 3**.

1.24 The number of watercourse crossings have been limited where possible and where required will be designed to allow fish migration.

1.25 Watercourse crossings will be subject to appropriate SEPA CAR licencing and will be designed to allow the conveyance of a 0.5% AP (200 year) flow event plus an allowance for climate change and freeboard. Additionally, mitigation will be put in place to control and attenuate runoff during all phases of the development and crossings will be regularly checked and maintained during operation.

Table 1 Main Watercourse Crossing (1:50,000 Scale Ordnance Survey Map) Inventory

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
1	237879	825190	Un-named 1:50,000 scale	Connecting track between T13 and spur for T11/T12. North-west of Loch a' Mhuilinn.	Bottomless arch or bottomless box.	Bed width average 0.25m x 0.05m water depth, narrow channel Valley dimensions 0.75m wide. Diffuse area upstream Substrate: Cobbles

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
						
2	237785	825016	Un-named 1:50,000 scale	Connecting track between T13 and spur for T11/T12. West of Loch a' Mhuilinn.	Bottomless arch or bottomless box >2m wide.	Bed width average 0.3m, 0.2-1.2m wide x 0.5-0.8m depth, narrow channel Valley dimensions: gentle slope, 5.5m -6.0m wide Substrate: Cobbles and soil. Evidence of wider flood plain
						
3	237990	824268	Un-named 1:50,000 scale	Connecting track between T10 and T9.	Bottomless arch or bottomless box >2m.	Bed width average: 0.6m, 0.2m to 0.7m wide x 0.05m to 0.2m depth Substrate: cobbles and gravel Downstream: more deeply eroded. Upstream meanders.
						

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
9	238296	822914	Un-named Immediately upstream or connected to 1:25,000 scale watercourse and therefore considered as a 1:25,000scale watercourse	Connecting track for spur to T3.	Bottomless arch, bottomless box or culvert >2m.	Bed width average: 0.5m. 0.1 to 1.1m wide, 0 to 0.15m deep. Substrate: Peat and occasional cobbles. Immediately upstream and connected to 1:25K watercourse. Erosional peat gully approx. 3m x 2m depth



Table 3 Minor Drain Crossings (Not shown on 1:50,000 or 1:25,000 Scale Ordnance Survey Maps)

ID	Grid Reference		Watercourse Name	Infrastructure Location	Type of Crossing	Description
	Easting	Northing				
Drain at T1	237625	822675	Minor drain Not shown on OS mapping	Crane pad hardstanding of T1	Culvert up to 60m section and / or divert around permeant crane pad hardstanding	0.1-0.4m width, 0.6m channel depth, 0.1m water depth, Boulder, gravel and soil substrate. Area around the drain is diffuse drainage.
Channel of drain at T1 crane pad hardstanding. Natural, cobble and soil substrate. Diffuse upgradient and downgradient.						
Examples of natural drains	Various	Various	Minor drains Not shown on OS mapping	Across the Site. 7 minor drains will be crossed, while others are downstream of track.	Culverts.	Channel dimensions are all less than 0.5m width. All have soil or vegetation substrate
Drain north of watercourse crossing 2 downstream of track		Drain near junction for spur to T12		Drain to Loch a' Chrathaich		