

M5 Junction 10 Improvements Scheme

**Environmental Management Plan
Annex B17 River Realignment and
Channel Diversion Management Plan**

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Environmental Management Plan Annex B17 River Realignment and Channel Diversion Management Plan

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B.17. River Realignment and Channel Diversion Management Plan

B.17.1. Introduction

Purpose

- B.17.1.1. This document forms Annex B17 of the Environmental Management Plan (EMP) 1st iteration (Application document TR010063/APP/7.3). Annex B17 is a River Realignment and Channel Diversion Management Plan (RRCDMP) (1st iteration) for the M5 Junction 10 Improvements Scheme (the Scheme). It will be completed on an iterative basis by the Principal Contractor(s) (PC) as the Scheme progresses through detailed design and will describe the approach to managing construction of the River Chelt realignment and associated temporary diversion.

The Project

- B.17.1.2. The Scheme is being progressed by Gloucestershire County Council (GCC) and comprises three main elements:
- An all-movements junction at M5 Junction 10, including four new slip roads, two new single span overbridges and a new elongated roundabout.
 - A new single carriageway, 1.4km long, the West Cheltenham Link Road located east of Junction 10 and connecting the A4019 to the B4634.
 - Widening of the A4019 to the east of Junction 10, including a bus lane on the A4019 eastbound carriageway from the West Cheltenham Fire Station to the Gallagher Junction and the inclusion of a new segregated active travel corridor to be provided along the northern side of the A4019.

Development Consent Order

- B.17.1.3. This Scheme is categorised as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008. As such, an application for a Development Consent Order (DCO) is required to obtain consent to construct the Scheme, rather than the traditional route of applying for planning permission, under the Town and Country Planning Act 1990, from the local planning authorities. This 1st iteration RRCDMP has been developed in support of GCC's DCO application. An Environmental Impact Assessment (EIA) has been carried out for the Scheme and is reported in the Environmental Statement (ES) and Environmental Statement Addendum (ESA). The ES and other DCO documents prepared to support the application are available through the Planning Inspectorate project document library TR010063.

Environmental Statement

- B.17.1.4. This 1st iteration RRCDMP supports Chapter 8 Road Drainage and the Water Environment of the ES (Application document TR010063/APP/6.6), the ES Addendum (Application document TR010063/APP/10.23) and chapter 7 Biodiversity (Application document TR010063/APP/6.5) and has been prepared to demonstrate how potential impacts to hydromorphology, water quality and ecology are mitigated during the construction of the River Chelt Realignment as described below.

- B.17.1.5. A constructability review by the Applicant has identified the need for a temporary diversion channel to allow for the construction of the River Chelt realignment associated with the Link Road River Chelt Bridge as outlined in the ES Addendum (Application document TR010063/APP/10.23). This requirement was not assessed in the DCO submission of Chapter 8 Road Drainage and the Water Environment of the ES (Application document TR010063/APP/6.6) or Chapter 7 Biodiversity (Application document TR010063/APP/6.5).
- B.17.1.6. The relevant phasing considerations and mitigation measures to prevent impacts to hydromorphology, pollution and ecological impacts from the river diversion have been included in the RRCDMP and, where applicable, in the Register of Environmental Actions and Commitments (REAC) (Application document TR010063/APP/7.4) and updated summary document (Application document TR010063/APP/10.26), as shown in Table B17-1.

Register of Environmental Actions and Commitments

- B.17.1.7. The following items are recorded in the REAC (Application document TR010063/APP/7.4) and updated summary document (Application document TR010063/APP/10.26).

Table B 17-1 River Diversion Phasing Plan REAC

REAC	Commitment text
B23	<p>The following measures will be put in place and overseen by a suitably qualified and experienced ECoW:</p> <ul style="list-style-type: none"> • All haul roads, lay down areas and compounds will be located at least 10 m from watercourses, except where access is required to specific locations for works to bridges/culverts for example. Site tracking routes will be arranged to avoid watercourse margins. • Rotary drilling rather than percussive piling will be used during the construction of the Link Road bridge. • Soft start up methods will be employed on plant being used for any in-channel works and works within 20 m of the River Chelt, including piling, at the start of each working day. The soft-start duration should be a period of not less than 20 minutes and should piling cease for a period greater than 20 minutes, the soft start procedure must be repeated. <p>In-channel works within the River Chelt and other disturbing works in the vicinity of the River Chelt associated with construction of the new bridge crossing will avoid ecologically sensitive periods for migratory fish species. February to July and October to November will be avoided as they are key migratory periods for European eel (this also avoids the spawning period for lamprey (March to April), trout (peaks in October to November) and salmon should they be present). These periods will be confirmed through ongoing consultation with Natural England and the Environment Agency. Where works during migratory periods is unavoidable, no night time (taken to be 30 minutes prior to sunset until 30 minutes following sunrise) vibration work will be undertaken. If night working is essential, minimal and directional lighting will be used.</p> <ul style="list-style-type: none"> • A River Realignment and Channel Diversion Phasing Plan will be required to consider the timing of activities and the work processes which are required to mitigate impacts to aquatic species and sediment loads. As a minimum, this plan will consider: Construction and design (including depth, velocities and sediment composition) of the temporary diversion to ensure hydrological and ecological continuity throughout the construction of the river realignment and Link Road River Chelt Bridge.

REAC	Commitment text
	<ul style="list-style-type: none"> • Dewatering of the River Chelt associated with the diversion and appropriate mitigation to manage impacts as a result of dewatering. • Mitigation measures to manage silt when the temporary diversion is connected to the main channel and when the new realigned channel is reconnected as the primary flow pathway. <p>A fish rescue plan, required in the event that species are found in the river Chelt, which will be developed in consultation with the Environment Agency and Natural England for in channel works associated with the existing river Chelt and the temporary diversion on completion of the realignment. The fish rescue plan will include a requirement for an ecological watching brief and will detail the measures to be put in place to ensure protection of all fish species during in-channel works.</p> <p>The fish rescue plan shall include details of any licence requirements to permit fish rescues (e.g., FR2: Application for authorisation to use fishing instruments other than rod and line in England), as well as the requirement for appropriate screening of any pumping equipment (typically 2 mm screens) to avoid potential entrainment/mortality of fish during the works. The fish rescue plan will consider the use of temporary stop nets across the channel upstream of the works to prevent fish from becoming entrained in the working area.</p> <p>The fish rescue plan will consider measures to displace fish from the working area prior to construction works, such as removal of channel features from the working area that provide cover such as large wood to reduce the overall attractiveness of the working area for fish species. This is particularly relevant to benthic species such as European eel that frequently occupy voids between larger substrates. Such in channel features that provide cover will be replaced after the works. The fish rescue plan will also cover the need to relocate lamprey ammocoetes prior to dewatering in order to reduce the potential for injury/mortality.</p>
B24	<p>B24 covers a number of items relating to Pre-commencement surveys to update ecological constraints prior to construction. The item specifically related to this RRCDMP is:</p> <p>A pre-construction Invasive Non-Native Species (INNS) survey will be undertaken to enable mapping and demarcation of all stands of INNS within the Scheme footprint and identification of an appropriate control/eradication strategy.</p>
WE15	<p>WE15 covers a number of items relating to minimising impacts on flood risk as a result of the construction of the Scheme. The item specifically related to this RRCDMP is:</p> <p>The construction stage arrangements will be tested through hydraulic flood modelling, using the latest available versions of the software, to demonstrate compliance with the FRA (Application document TR010063/APP/6.15) and (Application document TR010063/APP/10.25).</p>

B.17.2. River realignment and Channel Diversion Management Plan

Legislation, regulations and other requirements

- B.17.2.1. The construction works will comply with all relevant legislation and regulations to ensure legal construction works.
- B.17.2.2. Other requirements from Statutory Bodies will be reviewed by the contractor and applied where applicable.

- B.17.2.3. All work carried out will be conducted with due cognisance of client standards, obligations and best practice.
- B.17.2.4. A legislation register will be maintained and updated following any changes to applicable legislation. Any applicable changes will be evaluated and communicated to the relevant personnel through environmental alerts, newsletters, staff briefings or toolbox talks. Site-specific procedures will also provide guidance to activity specific legislation.

Project team roles and responsibilities

- B.17.2.5. Please refer to Table 2-2 of the EMP 1st iteration (Application document TR010063/APP/7.3). Roles and responsibilities of water environment and contaminated land specialists' personnel will be detailed here in the next iteration.

Site Induction, toolbox talks and environmental training

- B.17.2.6. The specific requirements for inductions, daily briefings, toolbox talks and environmental training will be updated by the contractor as the EMP develops.
- B.17.2.7. All staff will be trained in the use of any specific equipment required for the river diversion works and will be fully briefed on the actions to be taken to deal with and report an environmental incident.
- B.17.2.8. Site-specific toolbox talks will include details of the actions to be taken in the event of an environmental incident.
- B.17.2.9. Environmental Site Notices, posters and advisory notices dealing with environmental incidents will be displayed on the main site office notice boards.

B.17.3. Phasing Plan

- B.17.3.1. As the design progresses, the phasing plan set out below should be developed into a programme of works which fits into the overall construction programme. All works associated with the River Chelt Realignment and construction of the Link Road River Chelt bridge should be undertaken to minimise disturbance to migratory fish species with the works being timed to occur outside of the key ecologically sensitive periods for migratory species, where possible, as outlined in REAC commitment B23 (Application document TR010063/APP/7.4) and updated summary document (Application document TR010063/APP/10.26).
- B.17.3.2. All works should be undertaken with due regard to INNS and appropriate biosecurity procedures on site. A pre-construction INNS survey will be undertaken to enable mapping and demarcation of all stands of INNS within the Scheme footprint and identification of an appropriate control/eradication strategy as outlined in REAC Commitment B24 (Application document TR010063/APP/7.4), updated summary document (Application document TR010063/APP/10.26] and the EMP Annex B5 – Landscape and Ecological Management Plan (Application document TR010063/APP/9.5).
- B.17.3.3. INNS of particular note at this location are Signal Crayfish and Himalayan balsam which were both recorded along the River Chelt during survey in 2020.
- B.17.3.4. An Emergency Preparedness and Response Plan (Application document TR010063/APP/9.6) has been prepared and should be followed in conjunction with this RRCDMP to ensure that risks associated with emergencies are mitigated and that in the event of an emergency, the appropriate steps are made to reduce impacts.

Phase 1 – Construct diversion

- B.17.3.5. The diversion channel shall be constructed to the south of the existing River Chelt alignment. During Phase 1, the channel shall not be connected to the River Chelt at the upstream or downstream end. The diversion will be designed to ensure bed levels tie into the existing River Chelt bed where they are to be connected during Phases 3 and 4. The design will ensure that the channel is configured to maintain appropriate depth of water to facilitate fish passage during low flows while also being able to pass appropriate flood flows (to be agreed with the Environment Agency) noting that the addition of coarse substrate may be required to support movement of fish through the diversion. The construction stage arrangements (including the phasing of the River Chelt Realignment) will be tested through hydraulic flood modelling, to demonstrate compliance with the FRA and support the Flood Risk Activity Permit application which will be granted by the Environment Agency as outlined in REAC commitment WE15 (Application document TR010063/APP/7.4).
- B.17.3.6. Any materials removed to construct the diversion should be stored in line with EMP Annex B1 – Materials Management Plan (Application document TR010063/APP/9.1).

Phase 2 – Prepare to connect diversion

- B.17.3.7. Undertake the following steps to reduce the risk of fish being stranded within the River Chelt once the diversion is connected:
- Install temporary stop nets at upstream and downstream end of existing River Chelt channel length that will be diverted to prevent fish from entering this stretch.
 - Appoint specialist sub-contractor to undertake electric fishing runs to deplete all areas of fish.
 - Include targeted lamprey ammocoete electric fishing of fine sediment areas to draw lamprey larvae out of sediments.
 - Relocate fish to an appropriate location within the River Chelt outside of the working area. Appropriate locations should be agreed with the Environment Agency based on requirements under the FR2 license and considering the presence of suitable habitat for species captured.

Phase 3 – Diversion downstream connection

- B.17.3.8. Connect the temporary diversion at downstream end only ensuring installation of downstream silt control measures such as silt nets. Control measures should be checked regularly to ensure they are working effectively. Water will propagate up the diversion which will reduce the risk of fine sediment mobilisation.

Phase 4 – Diversion upstream connection

- B.17.3.9. Connect the diversion to the River Chelt at the upstream extent once the diversion channel has filled from the downstream extent. Flows will pass through both channels simultaneously. Maintain silt control measures downstream during the connection process and maintain watching brief of turbidity levels. Implement further silt control measures if initial measures are insufficient at managing sediment loads. This could consist of additional silt management measures being installed at appropriate distances downstream or the addition of different measures which have a greater capacity to capture sediment (e.g. silt curtains with flocculants).

Phase 5 – Flow diversion through diversion

- B.17.3.10. Install bund (clay/gravel plug) in the existing River Chelt channel at downstream end, followed by a bund in upstream end to divert all flow through the diversion. Fish stop nets can now be removed.
- B.17.3.11. Once visual inspections show that silt levels have reduced, remove silt management measures as their presence may impede fish movement through the reach. If removed, maintain close watching brief to monitor turbidity and temporarily reinstate sediment control measures if there are any peaks in fine sediment mobilisation.

Phase 6 – Dewatering of the River Chelt

- B.17.3.12. Dewater the existing River Chelt channel and employ ecological watching brief to check for any stranded fish and relocate them into an appropriate location within the River Chelt outside of the working area. Consider suitable habitat for the appropriate species captured in line with REAC commitment B23 (Application document TR010063/APP/7.4) and updated summary document (Application document TR010063/APP/10.26). Appropriate locations should be agreed with the Environment Agency based on requirements under the FR2 license and considering the presence of suitable habitat for species captured. Ensure the watching brief also identifies any INNS, such as Signal Crayfish, which may be present¹. Appropriate management methods should be implemented to ensure no spread of Signal Crayfish upstream or downstream within the River Chelt or any watercourses nearby.
- B.17.3.13. Employ appropriate dewatering controls e.g. silt buster or settlement basin before discharging back to watercourse downstream of the diversion. This should ensure discharges back to the watercourse are free from fine sediment load in order to negate the need for reinstallation of in channel silt management controls which may impede fish passage through the diversion channel.

Phase 7 – River Chelt realignment

- B.17.3.14. Cut the new realigned River Chelt channel yielding gravels from existing channel to 'seed' enhanced channel for creation of gravel runs and glides. Add in any required bank protection works at the location where the Link Road River Chelt Bridge will cross the channel. Fill in length of existing channel that is no longer required, i.e. not integrated into the enhancement design.
- B.17.3.15. Note that dewatering of newly cut enhanced channel may be required during enhancement works. Mitigation outlined in Phase 6 above regarding management of fine sediment management should continue through the length of any dewatering activities.

Phase 8 – Prepare to connect realigned River Chelt

- B.17.3.16. Once the new realigned River Chelt has been cut, works can begin to reconnect the main channel.
- Install stop nets at upstream and downstream end of diversion channel.
 - Appoint specialist sub-contractor to undertake electric fishing runs to deplete all areas of fish which may have settled in the diversion channel.
 - Include targeted lamprey ammocoete electric fishing of any fine sediment areas which may have accumulated in the diversion channel.
 - Relocate fish into an appropriate location within the River Chelt outside of the working area. Appropriate locations should be agreed with the Environment

¹ One Signal Crayfish was recorded during survey on the River Chelt in 2020.

Agency based on requirements under the FR2 license and considering the presence of suitable habitat for species captured.

Phase 9 – Reinststate River Chelt

- B.17.3.17. Remove the downstream bund, followed by upstream bund and cease dewatering in new realigned River Chelt as flow is reinstated. Ensure that in-channel silt control measures are in place during the re-connection and functioning effectively.

Phase 10 – Dewater and infill diversion channel

- B.17.3.18. Place stop bunds (clay/gravel plug) at the upstream then downstream extents of the diversion channel to prevent flow entering the diversion channel. Remove stop nets. Dewater diversion and employ watching brief to check for any residual fish which should be moved to an appropriate location within the River Chelt outside the working area taking into consideration the habitat required for species caught and requirements under the FR2 license. Backfill diversion channel from upstream to downstream.

Phase 11 – Construct structure

- B.17.3.19. Construct embankments and Link Road River Chelt Bridge and re-instate terrestrial and riparian vegetation. Maintain silt monitoring throughout the works in close proximity to the channel in line with the EMP Annex B7 – Pollution prevention and control management plan (Application document TR010063/APP/9.7).

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