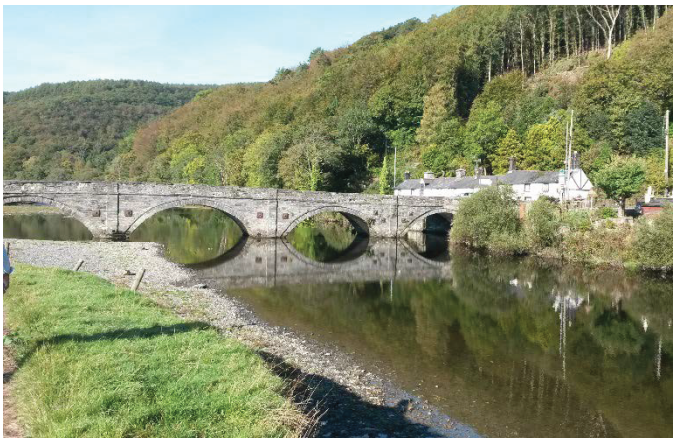
Llywodraeth Cymru / Welsh Government

A487 New Dyfi Bridge

Environmental Statement - Volume 3: Appendix 17.1

Pre-Construction Environmental Management Plan

Final Issue | 23 January2017



Contents

			Page
1	**Pre-CEMP**		**1**
	1.1	Background	1
	1.2	Stages of the Pre-CEMP	1
	1.3	Purpose of the Pre-CEMP	2
	1.4	Content of the Pre-CEMP	2
	1.5	Draft Register of Commitments	5
2	**Annexes to the Pre-CEMP**		**17**
	Annex A: Regulatory Framework		18
	Annex B: Preliminary Lists of Permits/Consents		19
	Annex C: Invasive Species Management Plan		20
	Annex D: Outline Pollution Control and Prevention Plan		21
	Annex E: Outline Site Waste Management Plan		22
	Annex F: Outline Ground and Surface Water Management Plan		23
	Annex G: Outline Materials Management Plan		24
	Annex H: Outline Cultural Heritage Management Plan		25
	Annex I: Outline Ecological Management Plan		26

1 Pre-CEMP

1.1 Background

1.1.1 This document is the Pre-Construction Environmental Management Plan (“Pre-CEMP”) for the A487 New Dyfi Bridge (the "Scheme").

1.1.2 The Pre-CEMP contains control measures and the standards to be implemented throughout construction of the Scheme, which have been developed through the Environmental Impact Assessment ("EIA"), as reported in the Environmental Statement ("ES").

1.1.3 The Scheme extends across the administrative areas of Gwynedd Council, Powys County Council, and Snowdonia National Park Authority. A description of the site, the Scheme and a high level construction strategy is provided in ES Volume 1: Main Statement. Chapter 17 of ES Volume 1 also provides an overview to the Pre-CEMP and the Environmental Management requirements for the Scheme contractor.

1.1.4 The term ‘construction’ in the Pre-CEMP includes all site preparation, demolition, earthworks, waste removal and related engineering and construction activities required for the Scheme to be built.

1.2 Stages of the Pre-CEMP

1.2.1 The Pre-CEMP will evolve into a Construction Environmental Management Plan ("CEMP") following engagement with stakeholders and local communities. This document should be treated as a live document and will be subject to refinement, amendment and expansion as necessary as the Scheme design, assessment and consenting processes develop.

1.2.2 Prior to construction, the Pre-CEMP will become the CEMP and will include updates from pre-construction surveys, and modifications as a result of commitments made at the Public Local Inquiry. A summary of the stages of the CEMP is provided here:

- a) Pre-CEMP - this document, which sets out a series of proposed measures and standards of work that will be applied by the Welsh Government and its Contractor throughout the construction period;
- b) Final CEMP - the Welsh Government will require it’s appointed Contractor to have a final CEMP which is certified to ISO 14001. The final CEMP will build upon the information contained in the Outline CEMP following the detailed design process; and
- c) Handover Environmental Management Plans (“HEMP”) - towards the end of the construction period the final CEMP will be refined into a HEMP which will represent a further development

of the Outline and final CEMP and will set out the proposed strategy for the future maintenance and management of all environmental areas and mitigation.

1.3 Purpose of the Pre-CEMP

1.3.1 The Pre-CEMP provides a consistent approach to the management of construction activities. The purpose of the Pre-CEMP is to:

- record environmental risks and identify how they would be managed during the construction period;
- provide a means of identifying environmental commitments, objectives and targets;
- provide a means of monitoring and reporting performance against the objectives and targets;
- provide a framework to ensure that all parties are aware of their responsibilities;
- establish a checklist of control procedures which must be integrated into the overall environmental management system.
- describe how construction activities would be undertaken and managed in accordance with the obligations of environmental legislation and policy, and the requirements of environmental regulatory authorities and third parties;
- provide detailed Environmental Management and Action Plans for reducing the potential for environmental impacts during construction;
- define the activities that may require consents or licences;
- act as a link and main document reference for environmental issues between the design and construction stage; and
- ensure the requirements of the Environmental Statement (ES) and the Commitments Register are met.

1.4 Content of the Pre-CEMP

1.4.1 As part of the Early Contractor Involvement process, the Pre-CEMP contains a number of management plans which will kick-start the environmental management process which are identified in the table below.

Annex	Description
Annex A - Regulatory Framework	This is a list of the legal statutory requirements for construction staff working on this scheme. The list compiled is not exhaustive.

Annex	Description
Annex B - Preliminary List of Permits/Consents	A list of the statutory consents and permits required before construction can proceed. Some items are subject to seasonal requirements.
Annex C - Invasive Species Management Plan	Identifies which invasive species have been identified on site and the procedure for construction works on how to deal with invasive species.
Annex D - Outline Pollution Control and Prevention Plan	Identifies the main risks of pollution during construction and the prevention measures which should be implemented to prevent or reduce the effects.
Annex E - Outline Site Waste Management Plan	Site Waste Management Plan ("SWMP") – used to plan, implement, monitor and review waste minimisation and management on construction sites. The Outline SWMP has been based upon the Waste and Resources Action Programme's ("WRAP") SWMP template;
Annex F - Outline Ground and Surface Water Management Plan	Developed in consultation with NRW. It shall describe the design of each element of surface water management system required to manage surface water runoff during construction and potential risks to surface waters. This shall include consideration of temporary storage and settlement requirements to manage sediment load of waters. The GSWMP shall define the water quality criteria to ensure any discharge to receiving watercourses meets regulatory requirements.
Annex G - Outline Materials Management Plan	The Scheme's Materials Management Plan ("MMP"), detailing how all construction phase materials (material resources and waste) would be managed, will be developed and implemented by the appointed Contractor. This Outline MMP provides a framework which will be used as a basis from which to develop the Scheme's MMP;
Annex H - Outline Cultural Heritage Management Plan	Informed by the outcome of the EIA the CHMP contains detailed method statements for the scheme construction (from survey, machine-excavation, hand-excavation, environmental sampling etc. to office-based activities such as finds processing, database use, reporting etc).

Annex	Description
Annex I – Outline Ecological Management Plan	This outline plan pulls together the measures and procedures for reducing impacts on ecological receptors. It outlines the procedures for pre-construction surveys, vegetation clearance, draining ponds and translocating hedges.

1.5 Draft Register of Commitments

1.5.1 The table below presents an initial register which has been developed using data presented in the ES Volume 1 and would continue to be populated throughout the design, construction and operation stages of the Scheme.

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
1	Air quality	To manage dust/emissions on site	Develop and implement a Dust Management Plan, which will include measures to control other emissions, approved by the local authority. Implementation of Considerate Construction Management	ES Chapter 6 – Air Quality Assessment	Contractor	Preconstruction	Monitor compliance with the Dust Management Plan by carrying out regular site inspections, recording inspection results and making an inspection log available to the local authority, when asked. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Agree dust deposition, dust flux, or real-time PM10 continuous monitoring locations with the Local Authority, where required. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction. Considerate Construction award	To be completed during detailed design
2	Air quality	To minimise impacts associated with earthworks on local air quality and to reduce risk of dust	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Use Hessian, mulches and trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. Only remove the cover in small areas during work and not all at once	ES Chapter 6 – Air Quality Assessment	Contractor	Construction	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.	To be completed during construction phase
3	Air quality	To minimise impacts associated with construction on local air quality and to reduce risk of dust	Avoid scabbling (roughening of concrete surfaces) if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in soils with suitable emission control systems to prevent escape of material and overfilling during delivery.	ES Chapter 6 – Air Quality Assessment	Contractor	Construction	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken. Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and/or air emissions, either on-site or off-site and the action taken to resolve the situation in the log book.	To be completed during construction phase

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
4	Air quality	To minimise impacts associated with trackout on local air quality and to reduce risk of dust	Use water-assisted dust sweepers on the access and local roads, to remove, as necessary, any material transferred out of the site. This may require the sweeper being continuously in use. Avoid dry sweeping of large areas. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. Record all inspections of haul routes and any subsequent action in a site log book. Install hard surfaces haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. Implement and wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site were reasonably practicable). Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. Access gates to be located at least 10m from receptors where possible	ES Chapter 6 – Air Quality Assessment	Contractor	Construction	Measure and record implementation success of Travel Plan	To be completed during construction phase
5	Air quality	To minimise impacts associated with site maintenance on local air quality and reduce risk of dust	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period. Avoid site runoff of water or mud. Keep site fencing, barriers and scaffolding clean using wet methods. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site.	ES Chapter 6 – Air Quality Assessment	Contractor	Construction		To be completed during construction phase

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
			Cover, seed or fence stockpiles to prevent wind whipping Avoid bonfires and burning or waste material					
6	Air quality	To minimise impacts associated with emissions from operating machinery and vehicles	Ensure all vehicles switch off engines when stationary – no idling vehicles. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. Impose and signpost a maximum speed limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas. Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling walking and car-sharing).	ES Chapter 6 – Air Quality Assessment	Contractor	Construction		To be completed during construction phase
7	Air quality	To minimise impacts associated with emissions from site operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques, such as water sprays or local extraction. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use the fine water sprays on such equipment wherever appropriate. Ensure equipment is readily available on site to clean and dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	ES Chapter 6 – Air Quality Assessment	Contractor	Construction		To be completed during construction phase
8	Cultural heritage	To avoid accidental damage to Pont-ar-Ddyfi milestone	Carry out photographic record and, where appropriate, drawn record of all elevations Expose the buried part of the structure through archaeological hand excavation Cover milestone in protective layer to prevent damage	ES Chapter 7 – Cultural heritage assessment	Contractor	Pre-construction	No monitoring required	To be completed during pre-construction phase

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
			Remove milestone by mechanical hoist Store the milestone offsite until completion of works Re-erection of the milestone as close to its original location as possible on completion of works.					
9	Cultural heritage	To minimise impacts of construction on cultural heritage assets	Complete the existing outline Cultural Heritage Management Plan that is included within the Pre-construction Environmental Management Plan to bring it up to date for the Construction stage	ES Chapter 7 – Cultural heritage assessment Pre-CEMP, Annex H – Outline Cultural Heritage Management Plan	Contractor	Pre-construction	No monitoring required	To be completed during pre-construction phase
10	Cultural heritage	To record buried archaeological remains that will be affected by construction	Develop a programme of palaeoenvironmental sampling that will be by means of window samples. Agree extent of sampling and methodology with statutory consultee by means of a Written Scheme of Investigation. Preservation by record of any finds during construction Archaeological watching brief for areas of topsoil stripping, and where existing road surface is to be removed, in order to identify earlier road surfaces or features, if these are present Strip-man-sampling to be carried out in areas of high archaeology potential including: the area of the proposed site compound to the west of the Ffridd Round Barrows; Pont-ar Ddyfi Platform	ES Chapter 7 – Cultural heritage assessment	Contractor	Pre-construction/ Construction	No monitoring required. The contractor shall prepare a report of any findings within 2 years of the completion of any fieldwork.	To be completed during pre-construction phase
11	Landscape	To minimise landscape and visual effects caused by the proposed Dyfi Bridge development	Adoption and implementation of mitigation measures identified in the Environmental Masterplan	ES Chapter 8 – LVIA and Environmental Masterplan Figure 8.7 Environmental Masterplan	Contractor	Construction	Landscape mitigation to be managed and monitored for three year aftercare period following completion of works. To be undertaken in accordance with agreed Environmental, Landscape and Ecology, Monitoring, Aftercare and Management Plan.	To be completed during construction phase and post construction for 3 years.

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
12	Nature conservation	To protect biodiversity	Sensitive vegetation clearance to allow for the presence of amphibians, reptiles and nesting birds;	ES Chapter 9 – Nature Conservation; Environmental Masterplan Figure 8.7 Annex I Outline Ecological Management Plan		Construction	Employment of suitably qualified ecologist to supervise vegetation clearance, draining of ponds and ditches, and the installation of ecological mitigation incorporated within the scheme design	To be completed during pre-construction phase
13	Nature conservation	To protect European Protected Species	Pre-construction surveys to take place to ensure European Protected Species (e.g. bats, otters, Schedule 1 birds species (notably little ringed plover)) are not present within the construction area; if found, the following will be required: Appropriate licences; Timing of works planned to avoid disturbance; Appropriate buffer placed around any identified nests/EPS Restrict working hours at the Afon Dyfi and northern extent of the scheme to avoid night working and task lighting Restrict piling activities within 50m of the river corridor, unless using non-percussive methods, during periods of salmonid fish migration Excavations to be covered or a means of escape provided for animals Re-connection of severed hedgerows and field boundaries beneath the viaduct to maintain bat flight routes Planting around northern abutment to guide bats to livestock underpass Design and arrangement of crane pads and piling mats to retain and protect habitat for the five-spot ladybird	ES Chapter 9 – Nature Conservation, Annex I Outline Ecological Management Plan	Contractor	Pre-Construction	Pre-construction report on findings from pre-construction survey.	To be completed during pre-construction phase
14	Nature conservation	To prevent the spread of invasive plant species	Implementation of an Invasive Species Management Plan to ensure that legally controlled plant species, such as Japanese knotweed and Indian balsam, are not spread outside of the working areas.	ES Chapter 9 – Nature Conservation Pre-CEMP, Annex C Invasive Species	Contractor	Construction	Monitor locations of any new stands of invasive species within the project area. Follow UK Government guidance here: https://www.gov.uk/guidance/prevent-the-spread-of-harmful-invasive-and-non-native-plants	To be completed during construction phase
15	Nature conservation	To protect hedgerows	Hedgerows to be translocated in accordance with Environmental Masterplan	Environmental Masterplan,	Contractor	Pre-construction	Seasonal monitoring of health of translocated hedgerow as set out in Annex I.	To be completed during pre-construction phase

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
				Figure 8.7, Annex I Outline Ecological Management Plan				
	Nature Conservation	To Protect European Habitats	In order to protect Natural Habitats and Wild Flora and Fauna with legal protection and European importance. Mitigation measures identified within the SIAA state that construction would be carried out in accordance with guidance outlined within CIRIA best practice guidance and the Environment Agency (EA) Pollution Prevention Guidelines (PPGs) such as: • PPG1 General Guide to the Prevention of Pollution; • PPG5 Works and Maintenance in or near water; • PPG6 Working at Construction and Demolition Sites. Mitigation measures that may be required for protected species would be included within the Scheme to ensure legal compliance.	Statement to Inform an Appropriate Assessment under the Conservation of Habitats and Species Regulations 2010 900237-ARP-ZZ-ZZ-RP-YE-00004	Contractor	Pre-Construction And Construction	Pre-construction report on findings from pre-construction survey of protected species. Construction: Maintaining existing hydrological connections and protecting water quality and quantity through: Approved CEMP Water Management Plan Approved water quality monitoring programme	To be completed during pre-construction phase and Construction phase
16	Nature conservation	To enhance natural habitats and protect European Protected Species	Replant vegetation on the northern river bank to maintain connectivity for bat flight lines Introduce mammal fencing to encourage mammals to use the farm/livestock access under the scheme on the northern river bank Include a mammal underpass beneath the re-aligned A497	ES chapter 9 – Nature Conservation, Annex I Outline Ecological Management Plan	Tbc	Operation	Monitor use of mammal underpass	To be completed during construction phase
17	Ground conditions	To protect construction workers and controlled waters from unexpected contamination	Update of the Pre-CEMP Annex G: Outline Materials Management Plan and implement it. Undertake soil leachate testing on the materials designated for reuse during construction of the scheme Carry out foundation works risk assessments	ES chapter 10 – ground conditions Pre-CEMP, Annex G Outline Materials management plan	Contractor	Construction	No monitoring required for the Annex G Outline Materials Management Plan. Soil testing and reporting on leachate testing of materials used during construction as set out in Annex G Outline Materials Management Plan. Update and implement final Materials Management Plan. Foundation works risk assessments.	To be completed during construction phase
18	Materials	To reduce the impact from construction waste	Prepare a Site Waste Management Plan (SWMP) for inclusion within the CEMP. The SWMP is to detail the estimated quantities of waste material and the opportunities for reuse, recycling, recovery or disposal.	Pre-CEMP, Annex E Outline Site Waste Management Plan	Contractor	Pre-construction	SWMP report	To be completed during pre-construction phase
19	Materials	To reduce the impact of the storage compounds	Soil to be stored outside of the floodplain, where it can be left undisturbed and won't interfere with site operations.	ES Chapter 11 – Materials	Contractor	Construction	Report on storage of materials	To be completed during construction phase.

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
			Stockpiles to be positioned outside the root or crown spread of trees and away from ditches, watercourses or existing / future excavations.					
20	Materials	To reduce the impact from any operational maintenance waste	Assess any impacts resulting from material resource use and waste arising from any future maintenance, renewal or improvement works	ES Chapter 11 – Materials	Managing Agent Contractor	Operation	Impact assessment report	To be completed during operation
21	Materials	To reduce the impact from materials being used in construction	Materials to be responsibly sourced (as defined by BS8902) Site won materials to be used on site where possible – a specification for suitable material to be used in construction to be developed in accordance with Specification of Highway Works and testing to be carried out on site to confirm that materials used meet specification requirements which should be developed in line with the CL:AIRE Code of Practice	BS8902 CL:AIRE Code of practice	Contractor	Pre-construction	Report on materials sourcing	To be completed during pre-construction phase
22	Noise	To minimise noise from construction activities	Follow BS5228 for best practicable means construction methods for minimising noise during construction	ES Chapter 12 – Noise Bpm BS5228	Contractor	Construction	No monitoring required. The EIA assumes that Best Practicable Means mitigation is implemented to control construction noise in the form of low noise emission plant and processes (as specified in BS 5228).	To be completed during construction phase
23	Travellers	To reduce impacts on Non-Motorised Users	Provide a temporary diversion of PRoW for the following existing routes: Wales coastal path ad PRoW that runs alongside the south bank of the Afon Dyfi NCN Route 8 at northern end of scheme along the A487	ES Chapter 13 - Travellers	Contractor	Pre-construction	Approval from local authority for the temporary diversion of PRoW	To be completed during pre-construction phase
24	Travellers	To minimise Driver Stress/ Traveller Stress	Preparation of a Traffic Management Plan which would include a number of traffic management measures to be implemented: Early construction of realigned A487 at southern and northern ends to move traffic away from construction works and facilitate construction of bridge, Single way working of traffic in each direction to be maintained at all times Speed restriction in work areas for the safety of road users and the construction workforce Details of any short term temporary closures required Consultation requirements with bus operators to manage any disruption to bus services that may arise	ES Chapter 13 - Travellers	Contractor	Construction	Traffic Management Plan	To be completed during construction phase
25	Community and private assets	To minimise disruption to access of private property and land	Temporary alternative access to be provided for private property and/or land that is affected by construction activities Provision of underbridges and/or overbridges and permanent access for agricultural land. To include the provision of an agricultural underpass at the northern end of the Scheme to allow agricultural practices to continue for Y Ffridd. In addition agricultural passes to be provided throughout the middle section of the scheme.	ES Chapter 14 – Community and private assets	Contractor	Construction	Alternative access provision plans	To be completed during construction phase

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
26	Community and private assets	To maintain access for farmers across Pont-ar-Ddyfi	Access to be maintained for farmers across Pont-ar-Ddyfi to cattle pens from the north in events of flooding Continued vehicular access to fields to the east and west of the closed stretch of the former A487. Provision of replacement livestock handling pens to be installed at the access point from Dyfi Eco Park across the flood bund for Glanfechan Farm. Provision of New livestock handling pens for Marchlyn Farm Anglers not to be permitted vehicular access onto Pont-ar-Ddyfi bridge.	ES Chapter 14 – Community and private assets	Contractor	Post Construction/ Operation	Access arrangements maintained and provided	To be completed during operation
27	Community and private assets	To minimise disruption or loss of agricultural land	Where land has been used temporarily during construction (e.g. for construction compounds), this is to be returned to agricultural use following construction. Provision of underbridges or overbridges or new temporary and permanent accesses to mitigate severance. Construction of an agricultural underpass at the northern end of the Scheme to allow agricultural practices to continue for Y Ffridd.	ES Chapter 14 – Community and private assets	Contractor	Construction / Post construction	Restoration of land to agricultural use	To be completed immediately following construction
28	Community and Private Assets	To prevent or minimise localised flooding of properties	Localised flood protection measures to be provided at individual properties at the northern end of the existing Pont-ar-Ddyfi.	ES Chapter 14 – Community and private assets ES Chapter 15 – Drainage and Water Environment	Contractor	Construction	Approved flood protection measures	To be completed during construction phase
29	Water environment	To prevent degradation of surface water quality	Implement a CEMP (update the existing pre-construction EMP) in relation to protection of water resources during construction. Development of a Surface Water Management Plan (as part of the CEMP) Additional measures include: All potentially polluting substances including chemicals and oils would be stored outside of the floodplain on impermeable surfaces with controlled drainage to protect against pollution. This would include all activities such as refuelling of and washing out of plant and machinery.	ES Chapter 15 – Drainage and Water Environment Pre-CEMP	Contractor	Construction	Approved CEMP Water Management Plan Approved water quality monitoring programme	To be completed during construction phase

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
			No materials or topsoil would be stockpiled within the floodplain or near the River Dyfi. Areas of exposed ground would be minimised to reduce silty runoff. A surface water management system, using measures such as temporary silt fencing, cut off ditches, settlement ponds and bunds will be set up as early in the construction period as possible to capture all runoff within or traversing the site. Captured runoff should be directed (e.g. by pumping) to a settlement lagoon or sump from where it can be treated. It is recommended that the new outfall ditch to be constructed alongside the existing A487 be used, along with appropriate treatment measures (e.g. stop-logs, straw bales) to return site runoff to an acceptable quality before being discharged into the River Dyfi. Further local measures (e.g. silt fencing / straw bales) to prevent ingress of sediments/contaminants into existing drainage ditches should be implemented. In particular these measures should be used to protect the southern drainage ditch during construction of the adjacent flood bund. Works for the river bridge and within 7m of any watercourse would be carried out in accordance with the conditions of the relevant Flood Risk Activity Permit. All water pumped from excavations would be pumped via a pipe and gravel sump in order to prevent silt being agitated from the base of the excavation and to provide rudimentary filtration to the water prior to abstraction. For low volume pumping, water would either be pumped into a vegetated area remote from surface water drainage or into a small attenuation lagoon prior to being directed into the drainage system. For high volume pumping (100mm or above) water would be passed through an attenuation tank with a capacity of not less than 8m3. The outlet from the tank could be placed directly into site drainage, provided the water is free from silt contamination. Activities such as concrete pouring for piles, pier columns and abutments, as well as washout of vehicles/equipment will create water contaminated with concrete. This water should be collected and pumped to an adequate treatment solution (e.g. Siltbuster) before it is returned to the surface water management system. Any residual material (i.e. solids) from this process should be, where possible, re-used onsite under a					

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
			Materials Management Plan or otherwise transported to an appropriately licenced waste facility by a suitable vehicle. Areas of exposed sediment deemed at risk of erosion during heavy rainfall or flood inundation should be protected using either temporary measures (e.g. sheeting) or semi-permanent measures (e.g. coir matting) until vegetation is able to establish on these surfaces. The use of temporary or semi-permanent measures will vary based on the planned construction in that area. For example, the flood bund, once constructed, should be protected with semi-permanent erosion control until vegetation is established, whilst areas excavated for the haul road/laydown areas may only be exposed for a short period during construction and would therefore only require temporary erosion control. Works should be suspended during out-of-bank river flows to minimise the likelihood of polluted water entering the River Dyfi during a flood. Water that is unpolluted other than with fairly coarse particles as well as relatively small flows may be treated by passing through tanks or skips with a suitable filter such as gravel, geotextiles, straw bales or silt-busters. A water quality monitoring programme prior to and during construction works will be agreed with NRW. The process and procedure for responding to and reporting environmental incidents will be agreed with NRW and included within the CEMP.					
30	Water environment	To prevent degradation of geomorphology	Implement a CEMP (update the existing pre-construction EMP) in relation to protection of water resources during construction. Development of a Surface Water Management Plan (as part of the CEMP) Additional mitigation measures include: Minimise/avoid in-river working and avoid during spawning season; Minimise in-channel working, minimise and protect the extents of excavations and controlling plant trafficking routes. The extent of the excavation for the southern abutment (left bank) should be kept to a minimum, and the excavation and reinstatement carried out in such a way	ES Chapter 15 – Drainage and Water Environment WFD Assessment (Appendix 15.6) Pre-CEMP	Contractor	Construction	Approved CEMP Water Management Plan Flood Risk Activity Permit	To be completed during construction phase

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
			as to preserve the original structure and extent of the gravel bar. First, the coarse surface layer should be scraped off and stockpiled separately. The remaining material should then be excavated to allow for construction of the pile cap. At the earliest opportunity, the bar material should be replaced and the coarse surface layer reinstated. Plant should be excluded from the area of the gravel bar outside the limits of the excavation. Fully reinstate the gravel bar, including the coarse surface layer, at the earliest opportunity following construction of the pile cap at the southern abutment. The extent of the excavation for the northern abutment (right bank) and cattle pass should also be kept to a minimum. Vegetation removal to enable the work should be minimised and existing tree roots left in place with no modifications made to the natural bank profile beyond the lower limit of excavation. Bare areas exposed during any works to the river banks or by excavation or soil stripping on the floodplain should be protected with temporary measures to ensure no erosion or scouring during flood events prior to the installation of bioengineering and/or establishment of vegetation. Defined plant trafficking routes should be located away from the channel and river banks to prevent any further modification to in-channel features or loading of the banks which could cause bank failure. Construction activities affecting the river banks or any in-channel features should be carried out under the supervision of a qualified geomorphologist.					
31	Water environment	To prevent degradation of surface water quality (during operational phase)	Provision of a petrol interceptor and isolation device at Outfall 1 to act as a containment facility in the event of a tanker spill. Provision of an isolation device at Outfall 2 to isolate spills. Provision of a petrol interceptor and isolation device at Outfall 3 to act as a containment facility in the event of a tanker spill.	ES Chapter 15 – Drainage and Water Environment	Contractor	Post-construction		To be completed during construction phase
32	Water environment	To prevent degradation of geomorphology (during	To reduce risk to the integrity of the northern (right) bank at the location of the new abutment, tree clearance will be minimised. Where tree removal is required, stumps will be left in place to continue to provide	ES Chapter 15 – Drainage and Water Environment	Contractor	Post-construction	Evidence of bioengineering methods Monitoring of planted areas to ensure establishment and continued erosion control performance	To be completed during construction phase

No.	Env. Aspect	Objective of Mitigation/ Action	Mitigation measure/Action	Refer to following for further information	Responsibility	Timescale	Monitoring/reporting requirements	Target date for completion
		operational phase)	cohesion to the bank material and buffering from flows. Compensatory planting of appropriate woody species should be carried out to further reduce the risk of bank erosion. Hard revetment should be avoided. The pile cap at the southern abutment will extend into the gravel bar. The size would be minimised to the greatest extent possible and the top of the cap buried to beneath the minimum average flow level (6.576mAOD). This would allow the reinstated gravel bar to continue functioning naturally with natural exchange of bed material. It is also aimed at eliminating the need for hard revetment and helping preserve the aesthetics of the site over the long term. Scouring around the piers on the floodplain is likely to be less severe. Bioengineering methods would be incorporated into the detailed design stage to prevent the formation and growth of scour holes on the floodplain. Similar measures would be used around the southern abutment. Pre-established coir matting should be considered as an alternative to seeding in order to provide immediate protection and aid in rapid vegetation establishment. These areas should be monitored to ensure establishment and continued performance of bioengineering in erosion and scour protection. The new ditch outfall to the Afon Dyfi downstream of the Pont-ar-Ddyfi should be designed in such a way as to manage the risk of bank erosion using softer engineering solutions or bioengineering rather than hard revetment. The design and construction supervision of these mitigation measures will be led by a qualified geomorphologist.					
33	Water environment	To prevent flood risk (during operation phase)	Incorporate individual property protection at properties at Pont-ar-Ddyfi Cottages and upstream of the existing Afon Dyfi Bridge.					To be completed during construction phase
34	Consultation	All Topics with SEBS	Consultation will be held with SEBs during detailed design prior to construction	Environmental Statement	Designers	Detailed Design	No monitoring required.	To be completed during detailed design phase

2 Annexes to the Pre-CEMP

2.1.1 The sections below provide the structure for the Annexes which have been prepared at Key Stage 3 as part of the Pre-CEMP. These documents will be developed as the design process progresses through to Key Stage 6.

Annex A: Regulatory Framework

ANNEX A Regulatory Framework

General

Highways Act 1980

Noise and Vibration

British Standards Institution (BSI) (1991), British Standard 7445: Description and measurement of environmental noise. Part 2: Guide to the acquisition of data pertinent to land use.

British Standards Institution (BSI) (1991). British Standard 7445: Description and measurement of environmental noise. Part 3: Guide to the application of noise limits.

British Standards Institution (BSI) (2014) British Standard 8233: Guidance on sound insulation and noise reduction for buildings.

British Standards Institution (BSI) (2003). British Standard 7445: Description and measurement of environmental noise. Part 1: Guide to environmental quantities and procedures.

British Standards Institution (BSI) (2014). British Standard 5228: Code of Practice for Noise and Vibration Control on Construction and Open Sites. Part 1: Noise +A1: 2014.

British Standards Institution (BSI) (2014). British Standard 5228: Code of Practice for Noise and Vibration Control on Construction and Open Sites. Part 2: Vibration.

Part III of the Control of Pollution Act (1974).

Air Quality

Defra (2007) The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. Volume 2.

Institute of Air Quality Management (IAQM) (2012). Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance.

Institute of Air Quality Management (IAQM) (2014) Guidance on the assessment of dust from demolition and construction.

Geology and Soils

Environmental Damage (Prevention and Remediation) Regulations 2009

Environment Act 1995

Environmental Protection Act 1990

Materials and Waste

EU Waste Framework Directive 2008/98/EC

The Waste (England and Wales) Regulations 2011 (as amended)

Hazardous Waste (England and Wales) Regulations 2005 (as amended)

Wildlife and Countryside Act 1981 and Environmental Protection Act 1990

Environment (Wales) Act Part 1: "Sustainable management of natural resources" 2015

Environmental Permitting Regulations (England and Wales) 2010 (as amended)

The Climate Change Act 2008

Protection of Surface and Groundwater Resources

Environmental Permitting (England and Wales) Regulations 2010 (as amended).

Water Resources Act 1991

Annex B: Preliminary Lists of Permits/Consents

ANNEX B List of Permits and Consents

The potential permits and licences required for the Scheme are illustrated below. The likelihood of these being required is subject to the presence of species, the detailed design of the Scheme and the methods of Scheme construction. Consultation with the consenting authority will be undertaken prior to any applications being made.

Summary of Potential Consents and Licences

Consent / Licence	Regulatory Regime	Consenting Authority	Status / Comment
European Protected Species Licences – Bats, Otters, Badger, Dormouse	Conservation of Habitats and Species Regulations 2010	NRW	The presence of European Protected Species will be confirmed by species surveys. In the event that an European Protected Species is found, the relevant applications will be made.
Scheduled Monument Consent (Listed Building Consent)	Ancient Monuments and Archaeological Areas Act 1979	Cadw	Should the Pont-ar-Ddyfi be directly affected by the Scheme, a Notice of Application for Scheduled Monument Consent will be applied for. As the Pont-ar-Ddyfi is both listed and scheduled, a scheduled monument consent would take precedence over listed building consent.
Flood Defence Consent	Water Resources Act 1991	NRW	Applications will be made as required prior to construction commencing for both temporary (works that do not form part of the permanent works) and permanent works.
Licence to abstract water and/or consent to discharge	Water Resources Act 1991	NRW	Applications will be made as required prior to construction commencing.
Section 61 Consent - Control of noise on construction site	Control of Pollution Act 1974	Gwynedd Council and/or Powys County Council	Applications will be made as required prior to construction commencing.

Annex C: Invasive Species Management Plan

ANNEX C Outline Invasive Species Management Plan

This is an Outline Invasive Species Management Plan which will be developed as the design of the scheme progresses and in line with consultation and agreement with statutory bodies.

Invasive Species records at Key Stage 3.

The following invasive species have been recorded during pre-construction surveys:

- Japanese knotweed (*Fallopia japonica*);
- Indian balsam (*Impatiens glandulifera*);
- New Zealand pygmy weed (*Crassula hemlseii*);
- Montbretia (*Crocosmia x crocosmifolia*); and
- Rhododendron (*Rhododendron ponticum*).

Locations of Invasive Species

Japanese knotweed and Indian balsam were found throughout the Study Area; along the Afon Dyfi banks, within woodland areas to the north of the river and within hedgerows and treelines in the western and north-eastern areas of the Study Area. Rhododendron (Rhododendron ponticum) has also been identified to the north of the existing Pont-ar-Ddyfi.

New Zealand pygmy weed (Crassula hemlseii) was also recorded in two water bodies during the National Vegetation Classification survey. The locations of invasive plants are shown on the Phase 1 Habitat Survey Maps on Figures 9.4 and 9.5 in Volume 2, with further details Target Notes in Appendix 9.1 and 9.2 in Volume 3. At this stage, quantities of invasive species are unknown and will be calculated during detailed design.

Impact of Invasive Species

The release of material contaminated with invasive plant material or seeds could result in adverse effects on other habitats where material is deposited or stored. The potential effect of any spread of these invasive species is assessed within ES Volume 1 Chapter 9 and considered to be of minor scale and not significant. Consideration of the issues with invasive species is also included in ES Volume 1 Chapter 8 in terms of the landscape and visual impact and Chapter 11 in regard to materials.

Construction Management

The Invasive Species Management Plan will be implemented during construction in order to comply with legislation:

- Under the Wildlife And Countryside Act: it is an offence to allow it to spread into the wild; and
- Under the Environmental Protection Act: Japanese Knotweed is classed as ‘controlled waste’ and as such must be disposed of safely at a licensed landfill site.

Prior to construction the detailed Invasive Species Management Plan will be developed and agreed with relevant statutory environmental bodies as part of the Construction Environmental Management Plan during the detailed design stage.

All site personnel should be made aware of the identification of the above species. Identification sheets for invasive species are available at:
http://www.nonnativespecies.org/index.cfm?sectionid=47

The following UK Govenrment site also provides useful background information on Invasive Species:
https://www.gov.uk/guidance/prevent-the-spread-of-harmful-invasive-and-non-native-plants

At construction stage, where invasive species are identified, a photographic record should be taken to confirm the species and details of the location (using a global position system (GPS) location reference). Findings should be reported to the ECoW as soon as practicable always in advance of works which might cause their spread.

Methods of treating invasive species will be considered during detailed design when the quantities and exact location of invasive species which will need to be removed are identified. Where possible material contaminated with invasive plant material (rhizomes, roots, stems corms or seeds) will be disposed of within the construction site in order to reduce as far as possible the amount of material that might need to be disposed of at a suitably licensed landfill site.

Annex D: Outline Pollution Control and Prevention Plan

ANNEX D Outline Pollution Control and Prevention Plan

D1 Introduction

D1.1 Purpose of the Plan

The Scheme passes through the predominantly rural landscape of the Dyfi valley and lies partly within the Snowdonia National Park, the boundary of which extends south of the river encompassing part of the valley floor. There are a number of surface water rivers within the scheme area including River Dyfi. In addition downstream to the River Dyfi the river is designated as part of the Dyfi SSSI, the Pen Llyn a'r Sarnau / Lleyn Peninsula and the Sarnau Special Area of Conservation (SAC), the Dyfi Estuary / Aber Dyfi Special Protection Area (SPA) and the Cors Fochno and Dyfi Ramsar.

Acknowledging the nature of the water environment and ecological importance, particular measures for minimising pollution risks to prevent pollution incidents occurring as a result of the proposed construction activities are required. This pollution control and prevention plan has been developed to manage these risks.

The purpose of the plan is to identify the main risks of pollution occurring on the site, to identify and implement appropriate pollution prevention measures, ad to reduce the effects of any pollution incidents that may occur. The plan should be read in conjunction with the Outline Ground and Surface Water Management Plan and CEMP.

D1.2 Status and Scope of the Plan

The document comprises an Outline Pollution Control and Prevention Plan and is based on the information available at the outline design stage. As the detailed design progresses, the Plan would be reviewed and updated accordingly. The final Pollution Control and Prevention Plan would be agreed with Natural Resources Wales (NRW) prior to the start of construction.

The plan would be implemented throughout the construction process of the Scheme and all construction staff would be required to follow its provisions.

D2 Responsibilities

The project manager would have overall responsibility for the construction of the new Scheme. A full-time Environmental Co-ordinator (ECO) would be appointed before construction commenced. Their main responsibility would be managing the environmental issues through construction. The specific tasks of the Environmental Co-coordinator are set out in CEMP.

For the purpose of the Outline Pollution Control and Prevention Plan, the key roles are set out in Table A2.1 below. Additional roles and responsibilities will be developed as the detailed design progresses.

Details	Responsibilities
Environmental Co-ordinator (ECO)	Liaising with NRW to update the Plan during detailed design. Agreeing the pollution controls in accordance with NRW requirements.

	Ensuring pollution controls are implemented and communicated effectively. Investigating any incidents. Communicate learning from incidents. Liaise with regulatory bodies
Construction Staff and workforce	Responding to a pollution incident in line with this plan and the procedure included within. Front line responsibility to enact requirements of the plan.
Project Manager	Responsible for ensuring procedures are followed.

D3 Pollution Risk Assessment

A preliminary pollution risk assessment has been undertaken to identify the main risks from the construction process. During the detailed design stage, the risk assessment would be updated as required.

The risk assessment will consider:

- The materials stored or transported and the condition of storage containers.
- Effects of accidents, flooding, vandalism and failure of containment.
- Location and proximity to local water courses, sensitive groundwater location and sites of special scientific interest.
- Surface water drains that flow off the site.
- Areas of unsurfaced ground.
- Operations and layout of the site.

The table below sets out the materials that would be handled on site and activities that may be a hazard.

Materials	Activities
Fuels/chemicals	Spillage during refilling (overfilling or poor handling) Damaged or leaking storage containers Equipment and containment failure
Sediment	Failure of pre-earthworks drainage Failure of lateral bunds Working too close to watercourse
Cementitious Dust	Inappropriate storage containers

D4 Site Design

D4.1 Location and Layout of Construction Compounds

Site compounds and car-parks will be located away from all surface water features and watercourses and outside of the floodplain.

Water pollution, storage of fuels, oils, wheel wash facilities, drainage and surface water run-off are detailed in the Outline Ground and Water Management Plan. Mitigations measures are described and will be developed and agreed before start of construction.

Wheel washing facilities will be established at designated site locations, away from water courses and drains. Cleaning will be carried out in a bunded area and waste water will be either recycled or discharged to foul sewer (with consent from the sewerage undertaker). Contaminated waste will be removed from site by a licensed waste carrier for disposal to an appropriately licensed facility.

D5 Pollution Incident Response Plan

D5.1 Response Plan

A pollution incident response plan will be designed for every construction compound. The plan will set out the actions to be taken in the event of a pollution incident and identify the pollution control equipment and the control devices and where they should be located.

The Response Plan would contain the following key information:

- external and internal list containing contacts 24 hour contact details for organizations that may need to be involved during or after an incident, for example, the emergency services, NRW, or Powys Council, Gwynedd Council and Ceredigion County Council.
- Chemical and waste inventory: an up-to-date record of all substances stored on site would be maintained together with an estimate of the likely quantities stored and product data sheets. The location of drums, containers or bulk storage vessels used for storing potentially polluting chemicals would be identified on the site plan. The inventory would be made accessible to emergency responders.
- Pollution prevention equipment inventory. This would include equipment and materials on site to deal with pollution incidents (for example spill kits, drain mats/covers, pipe blockers, absorbents) and contact details of staff trained in the use of specialist equipment (where relevant).
- Site plan showing access routes and meeting points for emergency services; areas or facilities used to store raw materials, products and wastes; watercourses located within or near the site; and site drainage.

Key actions for the response plan would include:

- stop the works immediately;
- contain the spillage to avoid escalation of the problem (refer to Pollution Control Hierarch);
- notify the Environmental Coordinator immediately and any other key staff;
- evacuate staff if necessary;
- call for emergency services if necessary;
- implement pollution control equipment;
- document the cause of the incident and the action take;
- replace pollution control equipment where required.

D5.2 Practice

Staff will be trained in the procedures which to follow if there is a pollution incident, in particular:

- where the personnel protective equipment and pollution control equipment is stored;
- how to use the equipment; and
- the location of pollution incident response plan.

In the development of the pollution incident response plan, drafts will be sent to NRW, and/or Powys Council, Gwynedd Council and Ceredigion County Council, as relevant, for comment, including advice on when to notify the regulators of a spill

D6 Fire Plan

Action to be taken in the event of fire:

- Raise the alarm
- Call the fire Brigade
- On hearing the alarm, the area must be evacuated immediately and staff to assemble at the Muster point.
- Visitors, clients and contractors to be escorted to the same assembly point.
- Turn off generators, compressors and other powered equipment.
- Turn off heat producing equipment and shut cylinder valve.
- Attack fire with the equipment if it is safe to do so.
- Obey instructions from the Office Fire Marshall or supervisory staff.
- Do not re-enter the working area until told it is safe to do so. If necessary inform others who may be affected by effects of the fire (smoke near hospitals, schools etc.)

The capacity of the construction surface water management system will be sufficient to contain within the site boundaries the water rejected by a fire truck, avoiding direct spillage of potentially contaminated material into the natural watercourses within the SSSI.

D7 Pollution Control Options

D7.1 Pollution Hierarchy

This section identifies the options that may be used to manage a pollution incident. The options are presented in the order of the preferred response.

Preferred response

System Least Preferred response

1. Contain at Source
2. Contain close to the Source
3. Contain on the Surface
4. Contain in the Drainage
5. Contain on or in the watercourse

D7.2 Spill Response Plans

The preliminary pollution risk assessment has identified that the most likely causes of a pollution incident would involve:

- spillage of oils or chemicals;
- a discharge of sediment-laden water or other pollutant into a watercourse; or
- firewater runoff.

Pollution control equipment would be appropriate for the location of the site and the chemical/substance it is being used because the site is within a flood plain and works are within the River Dyfi. For example, absorbent materials such as sand, spill granules, absorbent pads and booms will be kept at each site compound, on plant working near water courses and particularly at refuelling areas and where fuel or oil is stored.

Following a pollution incident, used pollution control equipment (for example, spill kits) would be disposed of appropriately and new/replacement equipment would be provided.

Some of the key actions that would be included in the action plans are as follows:

- Priority action plan to be implemented when possible : Contain at source
  - Stop at source or as close as possible from the source (especially prior to the drainage system).
  - Stop pollutant spreading by using oil booms, terram wrapped barriers, hay bales as applicable.
  - Trace impacts further downstream to establish extent of pollution.
  - Review the activity that caused the pollution prior to restarting work.
- Least action plan to be implemented when it is impossible to contain the spill at source : Contain on or in a watercourse:
  - Stop the flow at point of discharge
  - Stop the flow spreading
  - Dam the flow with earth/sand/polythene/absorbent material;
  - Divert the flow from drains/watercourses where possible;
  - Black off drains with drain covers or sandbags
  - Check the site drainage plan- where will spill end up?

D7.3 Discovery of Contaminated Land

The following will need to be adhered to in relation to encountering previously unidentified chemical contamination and asbestos during construction works.

- Ensure personnel involved in the earthworks are briefed on the likely nature and type of soils that could indicate the presence of contamination (e.g. asbestos, discolouration, oils, odours, ash and clinker materials).
- If such material is encountered, the Environmental Co-ordinator would be immediately contacted to inspect the material.

Testing of the material will be undertaken and the material will not be reused or removed until the results of the tests have been reviewed.

Contaminated materials will be handled and managed in line with the Remediation Strategy Report.

D8 Training

This procedure will be discussed in the Site induction. It will be displayed on noticeboards along with contact details of relevant individuals.

All personnel must attend a site induction before commencing work on the site. The induction will discuss the Pollution Control and Prevention Plan and also include key environmental issues on the project including the sensitivity of the watercourses, contamination, and air quality management. The briefing will emphasise the methods and working practices employed for protection, including emergency procedures for reporting and dealing with environmental incidents.

All staff will receive relevant training on environmental issues throughout the construction of the project.

All method statements will include an environmental section and any specific pollution control and prevention information.

Drills of this emergency response plans will be carried out regularly to ensure understanding.

D9 Monitoring, Review and Reporting

In accordance with the Environment Agency's Pollution Prevention Guidelines (PPGs) (although revoked they still maintain relevant as best practice guidance until updates are made available), and relevant construction industry guidance including CIRIA, best practice measures to prevent pollution will be implemented during the construction of the Scheme.

Should a situation arise where our proposed mitigation is not adequate, this plan will be reviewed. It will also be reviewed quarterly by the Environmental Co-ordinator to ensure it is up to date and accurate.

Specific monitoring requirements will be detailed. Nominated staff will carry out regular site inspections to control measures are in place and adhered to during the works.

Any instances of pollution or spill will be reported immediately to the Environmental Co-ordinator who will investigate and communicate investigation's conclusions to the project team to aid continuous improvement and to prevent reoccurrence of the event.

Records will be produced to show compliance with our Pollution Control and Prevention Plan, including inspections records, site plans and progress reports

Surface water monitoring will be undertaken to demonstrate no adverse effects on water quality during construction works. An appropriate monitoring schedule and programme will be agreed with NRW

Annex E: Outline Site Waste Management Plan

ANNEX E Outline Site Waste Management Plan

E1 Introduction

E1.1 Purpose of the Plan

The purpose of the Site Waste Management Plan (SWMP) is to set out proposals for the identification, segregation, handling and storage of different types of wastes identified as arising from the works. These wastes (by quantity/type/chemical composition/EWC code, etc.) will be recorded and their disposal route, including the place of their final disposal shall be reported in the Construction Environmental Management Plan.

The aim of using a SWMP is to minimise the amount of waste produced due to activities as a result of the project, minimising environmental impacts and maximising cost savings. The Client and Principal Contractor as named in this document shall take all reasonable steps to ensure all waste from this site shall be dealt with in accordance with the waste duty of care in section 34 of the Environmental Protection (Duty of Care Regulations 1991 (b) and materials will be handled efficiently and waste managed appropriately.

Date of original SWMP preparation	28th March 2016
Project start date	Spring 2017 (depending on Public Local Inquiry)
Project end date	2018
Estimated duration	23 months*

*The duration of the works is currently estimated to require a construction period of approximately 20 months, including 6 months advance works/ vegetation clearance/utility diversions, archaeological testing etc. and approximately 3 months of inspections and handover on completion of the Scheme.

E2 Waste Arisings

E2.1 Estimated Waste Arisings

In considering material resources use and waste management, it is important to define when, under current legislation and understanding, a material is considered to be a waste. The definition of waste is important because the classification of substances as waste is the basis for the formulation of waste management and the application of controls to protect the environment and human health.

The EU Waste Framework Directive (Directive 2008/98/EC) includes a common definition of 'waste', which is '*any substance or object which the holder discards or intends to discard'*, with the term 'discard' including the disposal, recovery or recycling of a substance.

Some types of waste are harmful to human health, or to the environment, either immediately or over an extended period of time. These are called special (or hazardous) wastes.

Once a material has become waste, it remains waste until it has been fully recovered and no longer poses a potential threat to the environment or to human health, at which point it is no longer subject to the controls and other measures required by the Directive.

In order to identify the types of waste generated by the proposed development, the construction programme is divided into its key stages as each stage of development has the potential to generate waste.

The type and quantities of waste likely to arise as a result of each stage of the project have been listed in Table 1. The intended use of each waste arising has been identified, based on the current available information. The table is not an exhaustive list of waste types and may be extended as the detailed design develops.

Table 1. A list of estimated waste arising's from each stage of the project.

Project Activity	Waste arising's from the project	Quantities of waste arising's	Intended use
Site remediation / preparation	Inert concrete	25 m^3	Segregated and disposed of off-site.
	Packaging (general waste from compound area and welfare set-up)	180 tonnes	Total over construction period (2 skips per month)
	Inert materials	2300 m^3	Unsuitable for re-use; disposed of off-site.
	Existing surfacing materials - bituminous	580 tonnes	Recycled for re-use on site.
	Invasive non-native species (INNS) including Japanese Knotweed and Himalayan Balsam.	Exact quantities not known at this stage.	See Annex C Invasive Species Management Plan.
Demolition	Metals	0.5 tonnes	
	Mixed construction and demolition wastes	53.5 tonnes	
	Surplus concrete	40m^3	Disposed of off-site
	Packaging domestic waste	180 tonnes	

Project Activity	Waste arising's from the project	Quantities of waste arising's	Intended use
	Liquid waste from septic tank	TBC	
	Crushed stone (material imported for temporary launch platform)	3200m³ 6400 to	
Operation and maintenance of asset	Replaced bearings	38	Metal to be recycled off-site if appropriate.
	Replaced expansion joints	26.8 m length	Steel to be recycled off site.
	Replaced parapets	1.1 km length	Metal to be recycled off site if appropriate.
	Resurfacing material	To cover an area of 767 m³	Residual material to be recycled off-site.
	Waterproofing spray	To cover an area of 6820 m²	Residual material to be recycled off-site.

E2.2 Waste Targets

The SWMP will set out a number of targets which the contractor will be required to meet. The targets have been agreed with the Client and set out in the ECI Design Build and Contract Information for Works Volume 2A (June 2015). The targets will be set to reuse or recycle construction and demolition waste and to enable the performance of the SWMP to be monitored and evaluated at the end of the construction period.

The following measures will be taken into account when implementing waste targets:

1. The Contractor will work towards the Welsh Government's Construction and Demolition Waste targets, which include:
    - 90% target (by weight) for recycling and re-use of non-hazardous construction and demolition waste by 2019-20;
    - 75% target for diverting waste away from landfill by 2019-20

2. The Contractor will work towards the Welsh Government's Construction and Demolition Waste priorities for reuse, recycling and landfill reduction, which include:
    - Reusing and recycling packaging waste;
    - Reducing the landfilling of biodegradable wastes;
    - Reducing waste arising's and increasing recycling of the following priority wastes: Wood, Plastic, Metal, Insulation & Gypsum and Hazardous Waste; and
    - Reducing the quantity of waste to landfill towards zero.

3. The Contractor will work towards the following targets and requirements:
    - recover a minimum of 70% of construction materials and packaging;
    - recover a minimum of 80% of demolition and strip-out materials; and

- ensure that at least 15% of total material value derives from reused and recycled content in new build, select the top opportunities to exceed this figure without increasing the cost of materials, and report actual performance.

E3 Waste Management

E3.1 Waste Hierarchy

Construction waste generated from the scheme will be managed according to the principles of the waste hierarchy which ranks waste management options according to environmental impact. The waste hierarchy indicates "waste prevention" as the best outcome for the environment and "disposal" as the least favoured.

The SWMP will set out how waste will be managed throughout each stage of the project. Prior to the commencement of site development, the Principal Contractor will identify suitable waste management contractors and investigate opportunities to recycle other materials.

A3.1.1 Prevention

The Contractor will ensure that waste is prevented where possible by using less material in design and manufacture and only ordering quantities of material required.

The SWMP will record identified measures to be implemented to prevent and minimise the quantity of waste produced during the project. The following measures have been identified as ways of preventing and minimising the quantity of waste produced during this project:

- All waste arising's to be segregated on site;
- Re-usable materials to be identified on site and removed for storage and re-sale;
- Recyclable materials to be removed from site for processing in licenced facilities; and
- Recoverable materials will be removed from site for processing in licenced facilities.

The Materials Management Plan (Annex G) sets out the procedure for managing the materials and identifies how the materials will be managed in order to minimise the amount of waste generated.

A3.1.2 Re-use

The Contractor will ensure that any waste generated on site will be re-used where possible in accordance with the waste hierarchy. The materials that have the potential to be re-used on site have been identified in Table 1. This will be confirmed during detailed design.

A3.1.3 Recycling

Recycling facilities in the vicinity of the proposed scheme location will be identified by the Principal Contractor. Only appropriately qualified and licensed waste management facilities would be used as a requirement of this SWMP. There is potential for the available sites for recycling, reprocessing and disposal to change and it is the responsibility of the Principal Contractor to evaluate the waste management market and identify suitable options.

A3.1.4 Recovery

There are unlikely to be any opportunities to use this option for waste generated by the proposed scheme.

A3.1.5 Disposal

Any waste that cannot be prevented, re-used, recycled or recovered, will be disposed of in a responsible manner.

Local waste management facilities will be identified and assessed to ensure adequate capacity for the waste generated by the proposed scheme. It is not anticipated that there will be a large amount of waste associated with the proposed scheme.

E3.2 Waste Storage

To be confirmed at detailed design stage

E3.3 Waste management facilities (on-site)

To be confirmed at detailed design stage

E4 Implementing the Site Waste Management Plan

E4.1 Roles and Responsibilities

The key roles and associated responsibilities with regard to this plan are outlined below. The Construction (Design and Management) Regulations 2015 also identify the legal duties, responsibilities and obligations of all the major roles within the construction team.

The Client will be responsible for the following:

- appointing the Principal Contractors for the purpose of the SWMP;
- ensuring that the SWMP is implemented effectively; and
- reviewing, revising and refining the SWMP (where necessary) in conjunction with the Principal Contractor.

The Principal Contractor has the overall responsibility for:

- updating and delivering this SWMP on behalf of the client;
- ensuring all procedures in this SWMP and followed;
- ensuring all contractors are suitably qualified and experienced in implementing the measures within this SWMP. These measures would be contained within the terms of contracts to ensure understanding and accountability;
- making and maintaining arrangements that enable those engaged in construction and demolition to co-operate effectively in promoting measures to manage waste in accordance with the terms of the SWMP;
- ensuring, so far as is reasonably practicable, that waste produced during construction is re-used, recycled or recovered;
- regularly reviewing (every three months as a minimum) the SWMP and update where necessary;
- reporting on the performance of the SWMP within three months of the work being completed (see Section 6.3);

- establishing procedures for the regular review and recording of the quality of the works as part of it Quality Management System; and
- maintaining records relevant to this SWMP.

E4.2 Training

A training regime focused on the provisions of the SWMP would be implemented for all relevant members of the construction team, including those carrying out demolition works to ensure their competence in carrying out their duties on the Scheme.

Any SWMP training would be additional to the mandatory training requirements on site Health and Safety.

A general site induction would be developed to introduce all site personnel to the main provisions of the SWMP, important environmental controls associated with the construction of the Scheme and effective delivery of the SWMP (for example, waste storage arrangements, waste segregation at source). A full register of induction attendance would be maintained on site.

Toolbox talks and method statement briefings would be given to the construction (and demolition) teams as work proceeds and would cover the types of wastes produced at each key build stage, and the SWMP controls related to specific activities undertaken during the works. A full register of toolbox talks and method statement briefing attendance would be maintained on site.

All training records would be maintained and filed on site. The records would include the content of the training courses (induction and toolbox training), record of attendance and schedule of review.

E5 Monitor, Review and Report (to be confirmed at detailed design stage)

E5.1 Monitoring of the SWMP

Monitoring of the SWMP would principally be achieved through the completion of the Waste Management Data sheets and regular inspections of the works areas by the Principal Contractors to ensure that the provisions of this SWMP and control measures outlined in relevant method statements are being implemented.

Duty of Care paperwork documenting the movements of waste from the site (i.e. Waste Transfer Notes) and the registered carriers' details would be retained.

E5.2 Review of the SWMP

During the construction process, the SWMP would be reviewed as often as necessary or at least once every three months to ensure that the plan accurately reflects the progress of the Scheme in terms of waste estimates and targets. As part of the review, the Principal Contractor must record the following:

• The types and volumes of waste produced;

• Identify on the plan the work area where the waste was removed from;

• The types and volumes of waste that have been

- re-used (and whether this was on or off site);
- recycled (and whether this was on or off site);
- sent for another form of recovery (and whether this was on or off site);
- sent to landfill; or
- otherwise disposed of.

E5.3 Report

Within three months of the end of construction, the Principal Contractor will report on the performance of the SWMP. This would include confirmation that the plan has been monitored on a regular basis to ensure compliance with the provisions of the SWMP, that the plan was updated accordingly and that any deviations from the plan would be explained.

In addition to the above, the report would include a comparison of the estimated quantities of each waste type against the actual quantities of each waste type, performance against the scheme standards and an estimate of the cost savings achieved by and costs incurred in completing and implementing the plan.

Annex F: Outline Ground and Surface Water Management Plan

ANNEX F Outline Ground and Surface Water Management Plan

F1.0 Introduction

F1.0.1 This document is an Outline Ground and Surface Water Management Plan and is based on the information available at the outline design stage. As the detailed design progresses, the plan would be reviewed and updated accordingly. The Outline Ground and Surface Water Management Plan would be developed in consultation with Natural Resources Wales (NRW) and would be agreed prior to the start of construction.

F1.0.2 The final Ground and Surface Water Management Plan (GSWMP) will consider all drainage required during the construction phase and will reference all industry and regulatory pollution prevention guidelines. It shall describe the design of each element of surface water management system required to manage surface water runoff during construction and potential risks to surface waters. This shall include consideration of temporary storage and settlement requirements to manage sediment load of waters. The GSWMP shall define the water quality criteria to ensure any discharge to receiving watercourses meets regulatory requirements.

F1.0.3 With regard to groundwater, the GSWMP shall consider all activities to be undertaken during the construction phase that may require groundwater control through pumping. The GSWMP will reference all relevant industry and regulatory pollution prevention guidelines. The GSWMP shall consider excavations within borrow pits, structures required for managing groundwater in areas of cut, the excavations required for bridge tower and viaduct pier foundations (particularly those requiring cofferdam construction) and excavations required for subsurface structures/utilities that may encounter shallow groundwater. The GSWMP shall define the nature and approach for groundwater management following its abstraction, including monitoring to determine the acceptability of chemical and physical quality with respect to discharge to the surface water system.

F1.1 Responsibilities

F1.1.1 Competent managers and key team members will be appointed to work on this plan and support it along the project duration. Additional roles and responsibilities will be developed as the detailed design progresses.

Staff	Responsibilities
Environmental Coordinator (ECO)-	• Ensuring adequate planning is undertaken to protect surface and groundwater from pollution, and for monitoring the effectiveness of these plans.
Construction Staff	• For the day-to-day implementation of the mitigation measures required minimising the impact arising from the works and for ensuring appropriate consents are in place and adhered to.
Project Manager	• Responsible for ensuring procedures are followed.

F1.2 Consents

F1.2.1 The treatment of waters arising from construction activities, including point source discharges resulting from the treatment of materials regulated by mobile plant licence will require regulation by NRW. An application for an environmental permit (Discharge Consent) will be submitted prior to works commencing. The permit will regulate the discharge of treated contaminated waters to ground, via re-injection (or possibly soakaway). A separate environmental permit will be required for each location.

F1.2.2 An abstraction licence will be in place for de-watering operations for dust suppression or pressure testing on site. A separate licence will be required for each location. An impoundment of water in any watercourse or abstraction exceeding 20 cubic metres a day will be controlled by means of NRW consent (Abstraction Licence).

F1.2.3 Construction works carried out over, under or near a main river, or in a flood plain or flood defence (including a sea defence) will require a Flood Risk Activity Permit. A permit will be required for each location.

F1.2.4 A Land Drainage Consent is required for all works carried out over, under or near an ordinary watercourse. Ordinary watercourses include non-main rivers and all ditches, drains, cuts, culverts, dikes, sewers (other than public sewers) and passages through which water flows. Consents will be in place for works falling within Gwynedd Council, Powys County Council, and Ceredigion County Council. Consents will be applied to the Local Authorities.

F1.3 Mitigation Measures

General Measures

F1.3.1 Temporary drainage systems will be installed and carefully managed to prevent localized flooding or pollution of surface and groundwater from silt and other contaminants.

F1.3.2 In areas where old potentially contaminated land has been identified, specific mitigation measures will be designed to manage and contain potential contamination in line with the Remediation Strategy Report. Detailed method statements will be prepared for works in these areas.

F1.3.3 Where concrete works are required for the bridge abutments within the River Dyfi, deck sections will be sealed and inspected.

Induction of site personnel

F1.3.4 All personnel will attend a site induction before commencing work on site. The briefing will emphasise the sensitivity of the watercourses, surrounding habitat and methods and working practices employed to protect the water environment.

Emergency Response Planning

F1.3.5 An emergency response plan will be developed in accordance with EA Guidance PPG21- Pollution Incidence Response Planning. The plan will be communicated to all personnel. Emergency spill control equipment such as spill kits, ail booms and absorbent materials, will be held at appropriate locations on site and within site compounds.

General mitigation measures

F1.3.6 An outline of the main work activities to be carried out throughout the scheme as well as relevant water management proposals currently being considered are described in the table below.

Risks Or Construction Activities	Mitigation
Concrete wash water reaching groundwater	• Work involving concrete and cement will be carried out in accordance with EA Guidance PPG 5 'Works in, near or liable to affect a watercourse'. Controls will be implemented to ensure that wet cement does not come into contact with river or groundwater. • Waters that have come into contact with wet concrete/cement will be captured and treated accordingly (e.g. using Siltbusters, pH control and coagulants) before being returned to the surface water management system. Any waste material recovered during this process should be re-used onsite where possible or otherwise it should be removed from site by a licensed waste carrier for disposal to an appropriately licensed facility. • Adequately sized and lined washout area to be developed and maintained. • Investigate concrete supplier's use of concrete sock.

Risks Or Construction Activities	Mitigation
Excavation activities	• No materials or topsoil should be stockpiled within the floodplain or near the River Dyfi. • Silt fencing, capture ditches and bunds should be constructed around the site and along the edges of River Dyfi and other watercourses to prevent the ingress of silt contaminated water.
Extensive filling operation	• Pre-earthwork drainage such as diversion channels leading to settlement ponds/ tanks. • Use of bunds adjacent to the watercourse to act as barrier for large material overspill during filling work. • Silt netting used to manage runoff.
Site Compound Facilities (including Car Parks)	• Site compounds will, where possible, be located away from all surface water features and watercourses and outside of the flood plain. • A site drainage plan will be prepared in advance of construction works to identify the location of all watercourses and drains/drainage paths. • All drainage on site will be identified and colour coding will be used to distinguish between surface water, foul sewer and combined drainage. This will ensure that all those working on site are aware of the type of drain in the event of a pollution incident. Pollution control measures such as the use of oil interceptors or the placement of bunds or silt traps will be used to prevent silt run-off entering drains.
Vehicle/Plant Movements	• Haul routes will be regularly inspected and maintained to minimise silty run-off. • Areas of hard standing will be provided at site access and egress points, where practicable. The areas will be regularly inspected and cleaned and road sweepers/cleaners will be employed on existing highways near the construction area. • All vehicles, plant and equipment will be regularly inspected and maintained in accordance with manufacturers' recommendations. Records of inspections will be maintained on site.
Wheel wash facilities	• Site wheel washing facilities will be established at designated locations, away from watercourses and the floodplain. Cleaning will be carried out in a bunded area and wastewater will either be recycled or discharged to foul sewer (with consent from the sewerage undertaker). • Any contaminated waste will be removed from site by a licensed waste carrier for disposal to an appropriately licensed facility. • Guidance from PPG13 will be used to put in place good practice for vehicle washing and cleaning.
Aquatic Protection	• Advice will be sought from all specialists involved in the project and will be entered into control documents and issued through to the workforce and management ahead of works affecting watercourses. • The use of construction materials on site will be free from contaminated material so as to avoid potential contamination of the watercourse.

Risks Or Construction Activities	Mitigation

Storage of fuels, oils and other chemicals	• Spill kits to be available near all points of work and personnel trained in their use.
	• COSHH store to be bunded and locked when not in use.
	• In areas of limited footprint, settlement tanks and oil separators will be used to treat contaminated water from the work areas.
	• Physical barriers to stop material overspill.
	• No fuels, oils or other chemicals will be stored in high- risk locations such as:
	  ○ within 50 metres of a spring, well or borehole
	  ○ within 10 metres of a watercourse
	  ○ places where spills could enter open drains or soak into groundwater
	  ○ Flood plain
	• Storage tanks will be sited on an impermeable base, surrounded by an impermeable bund, and inspected regularly for leaks. Any valve, filter, sight gauge, vent pipe or ether ancillary equipment must be kept within the bund when not in use.
	• Associated pipework should be situated above ground and protected from accidental damage
	• All bulk fuels storage must be contained within a double skinned bowser/container or have a bund. Double skinned tanks or bowsers must also be bunded unless the outer skin would provide secondary containment. The bund must have sufficient volume to contain 110% of the contents of the largest fuel/pipe container or 25% of the total storage capacity of all the containers, whichever is the greater.
	• All fuel containers, including those containing waste fuels, must be stored on a drip tray/bunded area away from vehicle traffic within a designated storage area, where possible, to avoid damage.
	• Guidance from the PPG3 will be followed for the use and design of oil separators for the surface water drainage systems and guidance from PPG2 will be used regarding to ground storage oil.

Drainage and flood risk	• Temporary settlement ponds and cut off ditches shall be put in place. • Where possible, permanent drainage will be incorporated into the works at the earliest opportunity, such as the newly constructed drainage ditch alongside the existing A487, in preference to temporary drainage systems. • Oil interceptors or the placement of bunds or silt traps will be used to prevent polluted run-off entering drains, additional guidance from PPGs will also be followed.

Risks Or Construction Activities	Mitigation
Surface water run-off/Silt from earthworks and bridge abutment works.	• Use of cut-off drains or ditches to channel water around the site and/or prevent silty water entering excavations and watercourses. These should be constructed along the downstream site boundary to prevent silted water leaving site. These should discharge to settling ponds/tanks. • Silty water will be treated to allow suspended solids to settle out before disposal. • Settlement and filtration ponds will have the base sealed to prevent water entering adjacent ground and to contain potentially contaminated water. • Settling ponds or tanks should be constructed to remove silt from site runoff. Ponds should be designed for the maximum predicted site runoff using a 1 in 100 year event and should be large enough to ensure sufficient residence time for particulates to settle out, prior to discharge of the water. • Wherever practicable, grey water systems will be used at site compounds to reduce run-off from site, improve water efficiency and reduce the potential for polluting discharges to surface watercourses. • All water pumped from excavations would be pumped via a pipe and gravel sump in order to prevent silt being agitated from the base of the excavation and to provide rudimentary filtration to the water prior to abstraction. • For low volume pumping, water would either be pumped into a vegetated area remote from surface water drainage or into a small attenuation lagoon prior to being directed into the drainage system. For high volume pumping (100mm or above) water would be passed through an attenuation tank with a capacity of not less than 8m3. The outlet from the tank could be placed directly into site drainage, provided the water is free from silt contamination. • Areas of exposed sediment deemed at risk of erosion during heavy rainfall or flood inundation should be protected using either temporary measures (e.g. sheeting) or semi-permanent measures (e.g. coir matting) until vegetation is able to establish on these surfaces. The use of temporary or semi-permanent measures will vary based on the planned construction in that area. For example, the flood bund, once constructed, should be protected with semi-permanent erosion control until vegetation is established, whilst areas excavated for the haul road/laydown areas may only be exposed for a short period during construction and would therefore only require temporary erosion control.

F1.3.7 This section will be further developed following detailed discussions with the site team, to ensure it is site specific.

Special measures within the Dyfi Valley

F1.3.8 This section will be completed at detailed design stage by the Contractor.

Special measures for Earthworks

F1.3.9 Worst case emergency procedures would be planned for within the Water Management Plan. Rainfall and associated surface water run-off during construction works can mobilise and transport pollutants into the water environment causing potential harm to plants and animals.

F1.3.10 Pollution from sediment and other pollutants can derive from a number of sources including:

- Run off from exposed ground and material stockpiles
- Run off from roads, haul routes and river crossings
- Wash down of plant/vehicles
- Fuel and chemical storage/refuelling areas
- Leaking / vandalised equipment
- Dewatering excavations
- Incidents such as heavy rainfall or flooding

F1.3.11 Key construction activities, which have the potential to impact upon water quality include:

- Site clearance, uprooting of trees and transportation of clearance arising's
- Excavation works, earthworks and unfinished embankments
- Materials, fuel and chemicals storage and handling
- Concrete activities and handling of concrete wash waters
- Physical disturbance of watercourses and their banks
- Piling and surcharge with band drains within the Gwent Levels

F1.3.12 Any works over, within and adjacent to River Dyfi will require a Flood Risk Activity Permit from Natural Resources Wales (NRW). Early consultation with NRW and the adoption of best environmental practice would be undertaken to agree appropriate pollution control measures and consent requirements.

Fuel Storage and Refuelling

F1.3.13 All fuel storage would be in double bunded, locked tanks, located in secure areas at the compounds, outside of the floodplain. A controlled procedure for refuelling of plant would be adopted across the works. All practicable means of securing fuel will be utilised on mobile plant. Refuelling will be carried out by appointed competent persons only. Measures to prevent pollution would be developed in alignment with PPGs and would include:

- Drip trays would be utilised underneath static plant; including generators.

- Spill kits would be available within each item of mechanical plant. Trained persons would be present on site to deal with fuel spillage.
- No plant would be utilised within a watercourse (including all dry ditches and field drains that exist currently) without full consideration of all available alternatives.

Topsoil Stripping and Storage

F1.3.14 Wherever possible, topsoil will be left in place to minimise the amount of unprotected ground exposed to runoff. Where topsoil removal is required it would take place as late as possible prior to other works in the area. Topsoil will be stored outside of the floodplain.

F1.3.15 In advance of vegetation clearance and soil stripping operations commencing within 10m of a watercourse, appropriate control measures would be implemented to prevent contamination.

F1.3.16 Topsoil stockpiles would be created and managed in accordance with best practice guidance. The sides of stockpiles would be graded to prevent ponding and to help shed rainwater. Exposed stockpiles that are to remain for long periods would be seeded with a standard Rye Grass seed mix immediately upon completion and in suitable weather conditions. This would minimise soil erosion during the soil storage period and to help reduce colonisation of nuisance weeds.

F1.3.17 Silt fencing would be installed around the margins of topsoil mounds to minimise the risk of sediment-laden runoff reaching watercourses.

Cut off ditches

F1.3.18 Cut-off ditches would be constructed where required on the uphill side of the works area. These ditches will serve to intercept overland flow from adjacent land areas in order to ensure that they do not flow over the site.

F1.3.19 Within the cut-off ditches temporary baffles will be formed to break up the flow distances and promote the settlement of fines. These baffles would be constructed from clean stone within geotextile bags and would be placed where there is a significant fall in the ditch gradient and/or long ditch sections leading to a single outfall.

F1.3.20 Run off from earthworks areas will be intercepted prior to it entering watercourses in order to prevent a pollution incident. Similarly baffles and other methods (e.g. straw bales) would be employed to prevent dirty water reaching local watercourses.

Settlement Pond Maintenance

F1.3.21 Pond maintenance during the construction phase would be carried out during periods of dry weather. The ponds would be drained, and sediment will be removed utilising a small excavator. The excavator would be careful so not to disturb the ponds formation whilst removing silt. This operation would not be carried out whilst water is flowing or prior to a forecasted rainfall event due to the potential remobilisation of silt. Ponds would be regularly inspected for integrity and any defects remedied immediately.

Management of Dust

F1.3.22 During the earthworks mass haul operation, damping down of the haul roads to minimise dust being generated by plant movements would be required. This would minimise dust pollution causing nuisance to neighbouring properties and businesses along the route of the new section of motorway.

Controlling Mud on local roads

F1.3.23 Wheel washing and other road / vehicle cleaning facilities would be provided as suited to each location where vehicles need to exit the site onto the public highway. As appropriate, these facilities would be manned so continuous vigilance is maintained. Similar facilities would be provided where plant crossings are required over local roads.

Monitoring, Review and Reporting.

F1.3.24 In accordance with the Environment Agency's Pollution Prevention Guidelines (PPGs) and relevant construction industry guidance, best practice measures to protect the water environment will be implemented during the construction of the Scheme.

F1.3.25 Should a situation arise where our proposed mitigation is not adequate, this plan will be reviewed. It will also be reviewed quarterly by the ECO to ensure it is up to date and accurate.

F1.3.26 Any instances of surface or groundwater pollution will be reported immediately to the ECO who will investigate.

F1.3.27 Specific monitoring requirements will be detailed. Nominated staff will carry out regular site inspections to control measures are in place and adhered to during the works.

F1.3.28 Records will be produced to show compliance with our groundwater and surface water management system, including inspections records, site plans and progress reports

F1.3.29 Surface water monitoring will be undertaken to demonstrate no adverse effects on water quality during concrete works. An appropriate monitoring schedule and programme will be agreed with NRW.

Annex G: Outline Materials Management Plan

ANNEX G Outline Materials Management Plan

G1.1 Introduction

G1.1.1 The Contractor shall include within the Construction Environmental Management Plan (CEMP) a Materials Management Plan (MMP). This shall be based on an appropriate risk assessment.

G1.1.2 This report presents the approach for managing the reuse of site won soils and provides an outline Material Management Plan in accordance with Contaminated Land: Applications in Real Environments (CL:AIRE) Guidelines ready for Qualified Person Declaration. This MMP has been prepared in order to support the requirements of the CL:AIRE Definition of Waste: Industry Code of Practice (DoW CoP), Version 2 (CL:AIRE, 2011).

G1.1.3 CL:AIRE is the current management organisation for the DoW CoP:

- It sets out good practice for the development industry to use when: Assessing on a site specific basis whether excavated materials are classified as waste or not; and Determining on a site specific basis when treated excavated waste can cease to be waste for a particular use; and
- It describes an auditable system to demonstrate that this DoWCoP has been adhered to.

G1.1.4 The scope of this MMP is to cover the Scheme. It will identify the information from the Scheme design and construction documentation to demonstrate the requirements of the CL:AIRE DoW CoP can be met.

G1.1.5 At Key Stage 3, the earthworks strategy for the Scheme, and hence this MMP, is at an outline stage and will be developed further as the Scheme design progresses.

G1.2 Overview of Materials Management Plan

G1.2.1 A new bridge is proposed to be built to reduce traffic flow pressure on the existing A487 Dyfi Bridge in Machynlleth, Powys. The Scheme consists of a new section of single carriageway road, approximately 1200m in length. The typical carriageway width would be 9.3 m (excluding verges), which would consist of two 3.65 m wide lanes, with a 1 m hard strip on either side or the carriageway. In addition, the typical cross section would include 2.5 m grass verges along both sides of the proposed bypass, increasing in width to accommodate forward visibility requirements as required.

G1.2.2 A variety of different materials will be required for the Scheme. The Scheme will be designed to prevent where possible the volumes of both the waste materials generated and the imported construction materials by reusing or recycling the available existing materials along the Scheme. The estimated material resources required for the project and the quantities and sourcing of materials has been listed in Table 1.

G1.2.3 Earthworks estimates predict a deficit of 3,400 m^3 of general earthworks materials, subject to appropriateness of the fill material. Where possible this material, and the other materials to be used as a part of the scheme, will be sourced locally.

Table 1. List of materials required for the proposed scheme

Project Activity	Material resources required for the project	Quantities of material resources required	Additional information on material resources
Earthworks	Excavated material	North of the river: 16,650 m^3 South of the river: 300 m^3	Total cut material = 16,950 m^3
	Placed material	North of the river: 2,250 m^3 South of the river (including flood bunds): 18,100 m^3	Total fill material = 20,350 m^3
	Any excess material required	Approx. 3,400 m^3	Sourced from local supplier
Site construction	Concrete	6,865 m^3	Sourced from local supplier.
	Steel reinforcement	1,295 tonnes	Sourced from local supplier.
	Metal parapet (1m high)	1.5km length	Sourced from local supplier.
	Verge fill	716 m^3	Sourced from local supplier.
	Waterproofing spray	To cover an area of 9,550 m^2	Sourced from local supplier.
	Silane impregnant	To cover an area of 1,925 m^2	Sourced from local supplier.
	Carriageway surfacing	To cover an area of 1,075 m^3	Sourced from local supplier.
	(Painted) Structural steel	1,840 tonnes	Sourced from local supplier.
	Paint	TBC	Sourced from local supplier.
	Bearings	55	Sourced from local supplier.
	Expansion joints	37.5 m length	Sourced from local supplier.
	Drideck (or similar)	To cover a length of 1.5 km	Sourced from local supplier.
	Envirodeck (or similar)	To cover a length of 1.5 km	Sourced from local supplier.
	Paint	Dependent on paint to be used	Sourced from local supplier.
	Bearing replacement	55	To be replaced every 50 years
	Gravel / crushed stone	5,000 m^3	For the piling mat and haul road which is assumed permanent
Operation and maintenance of asset	Expansion joints replacement	26.8m length	To be replaced every 50 years
	Parapet replacement	1.5km length	To be replaced every 50 years
	Resurfacing material	To cover an area of 1,075 m^3	To be replaced every 25 years

	Waterproofing spray	To cover an area of 9,550 m²	To be replaced every 50 years

G1.2.4 The Contractor shall ensure that materials are treated and used as set out in the MMP. At the completion of works, the Contractor shall provide evidence that materials have been treated and used in an acceptable manner.

G1.3 Supporting Documentation

G1.3.1 The following provides a list of the expected documentation requirements to support the completion of an MMP for the scheme:

- Invasive Species Management Plan;
- Earthworks Strategy;
- Land Contamination Management Strategy;
- Remediation Strategy including a verification plan;
- Earthworks Specification;
- Cut/Fill requirements and earthworks movements plan;
- Design Statement / Remediation Strategy;
- Qualified Person Declaration;
- Verification Report; and
- Proforma MMP.

G1.3.2 The other supporting documentation referenced will be prepared separately and references incorporated into the MMP as regulator agreement is obtained. The draft MMP will be reviewed and updated during detailed design of the proposed scheme.

G1.4 Summary

G1.4.1 There is an intent to maximise the reuse of any materials used on site for the construction of the proposed scheme. There is understood to be a net deficit of materials that demonstrates that site won materials will need to be imported for the proposed scheme. Prior to importing, the quantities will be assessed in order to minimise the potential for leftover materials. Where residual materials arise, the Contractor will be required to make arrangements for reuse through design and, if not, disposal.

Annex H: Outline Cultural Heritage Management Plan

ANNEX H Outline Cultural Heritage Management Plan

H1.1 Introduction

H1.1.1 In line with the Works Info Contract Volume 2A, a Cultural Heritage Management Plan (CHMP) shall be a live document prepared during the design stage and implemented during construction (Key Stage 6). The CHMP shall include, without limitation, the following:

- Procedures for advance works, if required;
- Procedures for watching brief;
- Protection of archaeological features;
- Phasing of archaeological activities on site; and
- Production of archaeological reports.

H1.1.2 This document is the Outline CHMP which begins the process at Key Stage 3 of identifying procedures and management of construction in relation to cultural heritage assets effected by the Scheme. This document shall be evolved by the contractor and the mitigation measures implemented during construction (Key Stage 6).

H1.2 Purpose of the plan

H1.2.1 The main purpose of the plan is to provide an overview of key Cultural Heritage aspects and features in the context of the Scheme and for construction management decisions.

H1.2.2 The CHMP is based on information gathered from the Environmental Statement (ES Volume 1) and the ES Technical Appendices (ES Volume 2).

H1.3 Description of Project

H1.3.1 The proposed A487 New Dyfi Bridge Scheme consists of a new viaduct structure across the floodplain and a river bridge to cross the River Dyfi approximately 480m upstream of the existing Pont-ar-Ddyfi. The length of the Scheme is approximately 1200m with approximately 705m being on structures.

H1.3.2 The scheme lies partly within Snowdonia National Park (SNP) and partly within its landscape setting. The receiving environment is highly sensitive. The potential impacts on the environment have been considered through an Environmental Impact Assessment and where possible design measures have been identified to reduce and/or avoid adverse effects on the environment (ES Volume 1, Chapter 7).

H1.3.3 The Scheme consists of a new section of single carriageway road. The typical carriageway width would be 9.3 m (excluding verges), which would consist of two 3.65 m wide lanes, with a 1 m hard strip on

either side of the carriageway. In addition, the typical cross section would include 2.5 m grass verges along both sides of the proposed bypass, increasing in width to accommodate forward visibility requirements as required.

H1.3.4 The typical carriageway width would be the same on the proposed structures across the flood plain and river, although with a reduced verge width on the eastern side of the carriageway from 2.5 m to 0.6 m on the viaduct and bridge.

H1.3.5 For most of its route, the Scheme would be elevated across a generally flat floodplain and at its highest point (on the river bridge) it would be some 9m above ground level.

H1.3.6 The majority of the Scheme would have a National speed limit. A 30mph speed limit would be provided at the southern end of the Scheme, for approximately the first 200m, reflecting the existing speed limit.

H1.3.7 The Scheme would not have road lighting, except at the southern end of the scheme within the 30mph speed limit. The requirement for the provision of highway lighting on the remainder of the Scheme has been assessed and concluded that there is no specific requirement for highway lighting.

H1.3.8 The highway drainage would be predominately provided by a kerb and gully highway drainage system, with combined kerb drainage units provided on the new structures. The highway drainage systems would discharge at three locations; the existing discharge point north of the river, via a profiled channel along the existing A487 to a point near the existing Pont-ar-Ddyfi, and via the existing outfalls adjacent to the existing railway bridge.

H1.3.9 The Scheme crosses the River Dyfi and floodplain on a structure, from a short embankment north of the Cambrian Line Railway Bridge over the A487 on the edge of Machynlleth. A simple priority junction is provided at the southern end of the scheme connecting the proposed works with the existing A487 and the Dyfi Eco Park.

H1.3.10 At the northern end of the scheme the alignment ties into the existing A487 in the area of the completed Ffridd Gate Improvement and the existing A487 would be renumbered as the A493, joining the new A487 alignment via a ghost island ‘tee’ junction (i.e. a painted traffic island to indicate that vehicles should not enter).

H1.3.11 The existing A487 would be de-trunked between the two tie in points with the new scheme. The Pont-ar-Ddyfi and the section of the existing A487 to the south of the river would be restricted to Non-Motorised Users (NMUs) only.

H1.3.12 A maintenance access track would be installed at ground level along the eastern side of the new viaduct, at the southern end this would connect to the existing A487. This access track would also form the key access route during the construction phase.

H1.4 Address of Project

H1.4.1 Site office: Y Plas. Machynlleth, Powys, Machynlleth, Powys, SY20 8ER

H1.5 Details of where this plan will be kept on site

H1.5.1 The contractor will keep an up-to-date version of the CHMP throughout the construction stage. The CHMP should be kept at the main site office and uploaded to the Scheme website.

Date site CHMP originally prepared	28th March 2016
Project start date	Winter 2016/Spring 2017 (depending on Public Local Inquiry)
Project end date	2018
Estimated duration	23 months*

*The duration of the works is currently estimated to require a construction period of approximately 23 months, including 6 months advance works/vegetation clearance/utility diversions, archaeological testing etc. and approximately 3 months of inspections and handover on completion of the Scheme.

Client	Welsh Government
Principal Contractor	Alun Griffiths Contractor Ltd
Originator	Senior Heritage Consultant, Arup
Responsible party for ensuring compliance with CHMP	Principal Contractor

H1.6 Description of Cultural Heritage Baseline

Scheduled Ancient Monuments

MG002 Machynlleth Bridge (Pont-ar-Ddyfi) SH744019

H1.6.1 The present bridge dates from 1805, and records suggest that it was constructed on dry land and the river then diverted to run underneath it (Davies 1991, 68). From the available evidence it would seem that the late 17th-century bridge occupied approximately the same position as its successor, although possibly slightly upstream, which may have allowed the later bridge to be constructed alongside. There is no evidence, however, to suggest that the course of the river has been substantially altered at this point. The bridge is also listed grade II* (nos 8506 and 22723.

ME231 Fridd round barrows SH751020

H1.6.2 The monument comprises the remains of two round barrows, probably dating to the Bronze Age (c. 2300 BC - 800 BC) and situated within improved pasture on the River Dyfi valley floor. The northern most barrow is a grass covered earthen mound, circular in plan and measuring 20m in diameter and up to 0.6m in height. The

southernmost barrow is a grass-covered earthen mound, circular in plan and measuring 21m in diameter and up to 0.8m in height.

H1.7 Listed Buildings

Record no.	Name	Grade	NGR	Importance	Description
22723	Pont-ar-Ddyfi (partly in Machynlleth Community)	II*	SH7441701921	High	See description for SAM, above
22891	Dovey Cottage, Pen-y-bont Cottages	II	SH7439201954	Medium	Grade II listed cottage on the N bridgehead of the Pont-ar-Ddyfi facing S across the river towards Machynlleth. The cottages were probably built at various periods from the early-mid 19th century, with later alterations. Single bay, with a modern studded stable-type door on the right, and timber windows with applied diamond lattice leads. Door and window openings on the ground floor have small raised key stones; the first floor window is raised through the eaves and gabled. Included as a good group of traditional cottages in vernacular style of the early 19th century, in an important and conspicuous location by the bridgehead.
22892	Pen-y-bont Cottages	II	SH7439701955	Medium	Grade II listed cottage on the N bridgehead of the Pont-ar-Ddyfi facing S across the river towards Machynlleth. The cottages were probably built at various periods from the early-mid C19, with later alterations. Single bay cottage, with a boarded door with applied cover strips on the left. 2-light window to both ground and first floors. Applied timber framing to the front. Included as a good group of traditional cottages in vernacular style of the early 19th century, in an important and conspicuous location by the bridgehead.
22893	Pen-y-bont Cottages	II	SH7440301956	Medium	Grade II listed cottage on the N bridgehead of the Pont-ar-Ddyfi facing S across the river towards Machynlleth. The cottages were probably built at various periods from the early-mid 19th century, with later alterations. Two bays, extending into an additional bay, a former separate cottage, to the W. The two E bays are approximately symmetrical, with a central boarded door and 4-pane horned sash windows, and having sliding sash windows to the first floor. The additional bay has a former door converted to a window, and a 4-pane sash window, and on the upper floor a small-paned window. Dark brick stack, and a stone

Record no.	Name	Grade	NGR	Importance	Description
					stack on the W party wall. Included as a good group of traditional cottages in vernacular style of the early 19th century, in an important and conspicuous location by the bridgehead.
22894	Pen-y-bont Cottages	II	SH7440901958	Medium	Grade II listed cottage on the N bridgehead of the Pont-ar-Ddyfi facing S across the river towards Machynlleth. The cottages were probably built at various periods from the early-mid 19th century, with later alterations. Nos 5 and 6 were probably the first to be built, in the later 18th century. Nos 5 and 6 are a pair at the E end of the row, set higher, and perhaps earlier in date. No 5 occupies a single bay, with the entrance on the right sharing the wide opening with No 6. Door is a stop chamfered frame. Pair of modern timber casement windows on ground and first floors. Blue brick stack. Included as a good group of traditional cottages in vernacular style of the early 19th century, in an important and conspicuous location by the bridgehead.
22895	Pen-y-bont Cottages	II	SH7441501959	Medium	Grade II listed cottage on the N bridgehead of the Pont-ar-Ddyfi facing S across the river towards Machynlleth. The cottages were probably built at various periods from the early-mid 19th century, with later alterations. Nos 5 and 6 were probably the first to be built, in the later 18th century. No 6 is a pair with No 5 at the E end of the row, set slightly higher and perhaps somewhat earlier in date. No 6 occupies two bays, with the entrance on the left sharing the wide opening with No 5. Boarded door in a stop-chamfered frame. Two-light paned timber window to the ground floor, and a similar but shorter window to the first floor, with a similar window above the entrance. Gable end blue-brick stack. The gable end has smooth-rendered bands painted black simulating timber-framing. Included as a good group of traditional cottages in vernacular style of the early 19th century, in an important and conspicuous location by the bridgehead

Mandatory requirements

H1.7.1 Any works that will affect the fabric of a listed building will require Listed Buildings Consent; this is obtained from the Local Planning Authority. Any works that will affect the fabric of a scheduled ancient monument will require Scheduled Monument Consent; this is obtained from Cadw.

H1.7.2 In both cases the application will be required to include detailed proposals for the works, together with a method statement to ensure that the designated asset is protected from harm, or, where harm may occur in the course of undertaking works that would eventually benefit the asset, a detailed method statement for recording the elements of the assets that may experience harm.

Procedures for Advance Works (if required)

H1.7.3 Prior to construction a programme of palaeo-environmental sampling, by means of window samples, will be undertaken. The detailed extent of this sampling will be agreed with the consultees, and the methodology set out in a Written Scheme of Investigation. It is envisioned that that this would comprise a programme of gridded hand auguring, aligned to British National Grid, at a spacing of 10m, within the footprint of the area to be affected by the scheme. It is proposed that the phasing of the palaeo-environmental works would be as follows:

- **Stage 1** – Geo-archaeological desk based review;
- **Stage 2**- Geo-archaeological assessment, including sample collection, description and interpretation, agreement of samples for further analysis in Stage 3;
- **Stage 3**- Palaeo-environmental assessment: sub-sampling to assess the presence of indicators such as pollen, plant macrofossils, diatoms, invertebrates etc.)
- **Stage 4**- Analysis: detailed examination of Stage 3 samples, including radiocarbon dating of suitable samples.
- **Stage 5**- Reporting: depending on the significance of deposits present reporting may include publication in an appropriate journal. This will be agreed with the consultees in light of the findings of previous stages.

Procedures for Watching Brief (if required)

H1.7.4 During topsoil strip, and any other activities requiring excavation, an archaeological watching brief will be maintained, in line with the Chartered Institute for Archaeologists *Standard and Guidance for an Archaeological Watching Brief*. As a minimum one archaeologist will be present on site, however where works are occurring concurrently in multiple locations, an archaeologist must be present at each location.

H1.7.5 In the event that archaeological remains are present, the following process will be followed:

- Excavation will cease, save for any works required by the archaeologist to fully expose the area of interest.

- The area of interest may require demarcation to prevent accidental damage prior to recording
- Where feasible, excavation will continue outside the area of interest, under archaeological supervision
- The archaeologist will undertake recording of the archaeological remains through limited excavation, written and drawn records and photography.
- If unexpected archaeological remains of particular significance are encountered, the local planning authority archaeological officer will be consulted regarding requirements for further recording.
- Once archaeological recording has taken place, excavation can recommence under archaeological supervision.

Protection of Archaeological Features (if required)

H1.7.6 In order to avoid accidental damage to the non-designated Pont-ar-Ddyfi milestone, the following avoidance measures are proposed, to be agreed with the consultees:

- Photographic and, where appropriate, drawn record of all elevations;
- Exposure of buried structure through archaeological hand excavation;
- Cover milestone in protective layer to prevent damage;
- Removal of milestone by mechanical hoist;
- Off-site storage until completion of works; and
- Milestone will be re-erected as close to its original location as possible.

Phasing of Archaeological Activities on Site

- Pre-construction- Palaeo-environmental auguring
- Pre-construction – Removal and storage of Pont-ar-Ddyfi milestone
- During construction – Archaeological watching brief

Production of Archaeological Reports

H1.7.7 Reports will be produced on the Palaeo-environmental sampling and analysis, and the results of the archaeological watching brief. In the event that archaeology of particular interest is identified, publication in appropriate professional journal may be required by the consultees.

Monitoring and review

H1.7.8 The works will require to be monitored and reviewed by the relevant local planning authority archaeologists. On a day-to-day basis the works will be monitored and managed by Arup.

Appendices and maps

H1.7.9 At the outline stage, the cultural heritage assets are identified on ES Figure 7.1. These will be developed during detailed design and final figures should be provided in the final CHMP.

Annex I: Outline Ecological Management Plan

ANNEX I Outline Ecological Management Plan

I1.1 Introduction

I1.1.1 Appropriate measures will be adopted to protect the ecology of the site with special attention to specified ecological resources, as identified within the ES. A full detailed Construction Environmental Management Plan (CEMP) will be produced during the detailed design stage of the Scheme and agreed with Statutory Environmental Bodies prior to construction.

I1.1.2 The following important receptors will be considered and protected through the implementation of the Final CEMP:

- Statutory designated sites including the Pen Llyn a'r Sarnau Special Area of Conservation, the Dyfi Estuary Special Protection Area and the Cors Fochno a Dyfi Ramsar Site and associated qualifying species;
- The Afon Dyfi;
- The Ancient Woodland Site to the north of the Afon Dyfi;
- protected and notable species (e.g. including bats, badger, otters, invertebrates, amphibians and fish;); and
- other habitats and features of ecological importance.

I1.1.3 Where reasonably practicable, environmental mitigation will be provided via the design and implemented by the contractor within the works. This will require preparatory work to be undertaken ahead of the start of construction to permit timely progress of the programme.

I1.1.4 Detailed measures to deal with ecological constraints will be prepared including the following, as appropriate:

- summary of features of interest for all known areas of nature conservation interest (as identified within the ES) which may be affected due to construction;
- provision of guidance on ecological best practice methods to be followed in order to mitigate potential ecological effects during construction;
- procedures to be adopted in the event of unanticipated discovery or disturbance of protected species;
- reference to the relevant procedures, including any special measures, to be implemented in the event of a pollution incident, where this occurs on or adjacent to an area where protected and/or notable species are known to be present; and
- individual habitat or species management plans to include the information above (where appropriate) for:
    - terrestrial habitats;
    - wetland habitats;
    - European Protected Species (e.g. otter and bats); and
    - other protected and/or notable species, e.g. badgers, breeding birds, amphibians, invertebrates and common reptiles.

I1.1.5 The contractor will, where reasonably practicable, reduce any habitat loss within the land provided for the Project by keeping the working area to the minimum required for construction of the Scheme.

I1.2 Measures to reduce potential impacts on ecological resources

I1.2.1 Management measures for potential ecological impacts are addressed in other sections of the pre-CEMP and are not repeated here. These include measures relating to:

- Invasive species control and management (see Annex C);
- Pollution control and prevention (see Annex D); and
- Ground and surface water management (see Annex F).

I1.3 Pre-construction Surveys

I1.3.1 Prior to the construction phase of the Scheme pre-construction surveys will be undertaken in accordance with best practice guidelines. These surveys will include surveys of:

- Specific surveys for Schedule 1 bird species; barn owl and little ringed plover to determine any licence or mitigation requirements;
- Trees that will be removed as part of the Scheme to determine if bat roosts are present;
- The banks of the Afon Dyfi to determine the presence of otter resting places;
- Waterbodies within the construction area to determine the presence of water voles; and
- Area of woodland and scrub to determine the presence of badger setts.

I1.3.2 The results of the pre-construction surveys will be reviewed to determine if any protected species licences are required and shared with the Statutory Environmental Bodies.

I1.4 Procedures for Vegetation Clearance

I1.4.1 Where possible vegetation clearance will be undertaken outside of the bird breeding season (March to September). Irrespective of the timing, all vegetation will be searched by an Ecological Clerk of Works prior to clearance to identify the presence of any legally protected or notable species.

I1.4.2 If legally protected species or their resting places are encountered during vegetation, where necessary vegetation clearance will be suspended and if necessary licences obtained, prior to clearance being completed.

I1.4.3 Amphibians, reptiles or Section 7 mammal encountered will be carefully moved out of the construction areas to suitable receptor areas outside of the construction footprint. Within grassland areas, the height of the sward will be reduced in stages within the construction area to encourage animals to move out of the footprint of the Scheme. The use of this method may vary depending on the time of year and ambient temperatures.

I1.5 Procedures for draining of Ponds

I1.5.1 Where waterbodies are required to be in-filled or re-profiled, they will be drained down under the supervision of an Ecological Clerk of Works. As water levels decrease the speed of dewatering will be slowed to allow any fish or amphibians to be removed to suitable receptor locations. Where possible aquatic vegetation from drained waterbodies will be placed on the banks of retained waterbodies for a minimum of 24 hours to allow invertebrates to move out of the vegetation.

I1.5.2 Care will be taken during the draining of waterbodies to adhere to the requirements of the invasive species management plan as outlined in Annex C in relation to invasive aquatic plant species.

I1.6 Procedures for the translocation of hedges

I1.6.1 The hedgerow on the western side of the existing A487 may require translocating to allow the reprofiling of the ditch which is present between the road and hedgerow. The following procedures will be undertaken for the translocation of the hedgerow under the supervision of an Ecological Clerk of Works:

- The hedgerow will be cut down to a height of 300mm;
- A receptor trench will be dug on the line of the new hedgerow location;
- Sections of the hedgerow will be lifted by an excavator ensuring that as much as possible of the root ball is lifted within the excavator bucket;
- The lifted sections will be gently lowered into the receptor trench ensuring that the plants are upright;
- The receptor trench around the plants will be back filled, with suitable soils from the digging of the trench, and lightly compacted;
- Standard trees within the hedgerow will not be translocated.
- If translocation occurs during dry periods the translocated plants will be watered regularly as required.

I1.7 Procedures for working near the Afon Dyfi

I1.7.1 In order to avoid effects on both otter and bat species, there will be restrictions on working outside of daylight hours within 30m of the Afon Dyfi and vegetation on the northern bank of the river. This restriction will cover the period from one hour prior to sunset through to one hour after sunrise.

I1.7.2 Work within this period and distance from the river may only be undertaken under supervision of an Ecological Clerk of Works, and ensuring that task lighting is directed or shielded such that light does not shine on to the river, its banks and the associated vegetation.

I1.7.3 Piling operations for the northern abutment and the two northern most piers of the viaduct will be restricted in the duration in order to reduce the potential for effects on migratory fish species within the Afon Dyfi. Piling will be limited to no more than 12 hours duration within any 24 hour period, and regular noise breaks will be included during the period of piling. It should be noted that the piles will be constructed by boring and casting the piles in situ which will produce significantly less noise and vibration than driven piles.