Dŵr Cymru Welsh Water

Aberarth Outfall (Phase 2) Realignment

Information to Inform a Habitats Regulations Assessment Stage 1: Screening

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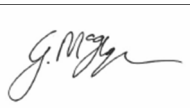
		Signature			
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1 Introduction

Ove Arup & Partners Ltd. (Arup) has been commissioned by Dŵr Cymru Welsh Water (DCWW) to provide information to inform a Habitats Regulations Assessment (HRA) to support the proposed works 'Project' for Aberarth Wastewater Treatment Works (WwTW), which now functions as a transfer Sewage Pumping Station (SPS), situated within the town of Aberarth, located to the east of Aberaeron in Ceredigion (approximate National Grid Reference SN 47878 64012). Site location and constraints plans are provided in Appendix A.

At present, storm sewage effluent from Aberarth SPS is discharged via a long sea outfall pipe; approximately 230m in length. The outfall is aligned north-north-westwards from the SPS under the sea defence wall and is buried beneath the shingle / pebble foreshore before discharging near MLWS. The outfall does not discharge to the consented location and the proposed works are therefore required to achieve full compliance with the existing Natural Resource Wales (NRW) Discharge Consent; Appendix B.

Situated on the exposed westerly Welsh coast, the Aberarth Outfall experiences intensive storm activity enhanced by the significant fetch developed over the Irish Sea. Weather conditions are predicted to become more frequent and extreme with climate change, making maintenance of the existing pipe at this location unsustainable.

The Project involves the installation of a new 8m section of HDPE pipe with protective concrete surround and a Non-Return Valve (NRV) [Tideflex] to enable discharges at the consented location (National Grid Reference (NGR): SN 47893 64105). This location amends the previous consented outfall at SN 47888 64085, which is being relocated to take into account changes in coastal processes. A 6mm screen will be installed in the Combined Sewer Overflow in order to meet consent.

The new pipe will therefore work to avoid the need for repeated maintenance visits, reduce the likelihood of consent breaches and avoid construction and trampling effects on the rocky reef. It will also avoid the potential for entrapment of the infrequent discharges should ephemeral coastal processes lead to cobbles blocking the Afon Arth at its mouth; the new proposal has been reviewed against historic shingle distribution and aligned in a new location to ensure the new outfall discharges within the predominant cluster of the Afon Arth outflow.

1.1 Purpose of this Document

This document has been prepared by Arup, on behalf of DCWW, to document the assessment of the relocation of the discharge pipeline (the 'proposed works') in relation to the potential for effects on European sites as required by Regulation 61 of the Conservation of Habitats and Species Regulations 2010 (as amended); hereafter referred to as the 'Habitats Regulations'.

1.2 Structure of this Report

- Section 2 provides information, including a description, of the Project;
- Section 3 provides information on the data and methodology used in the assessment;
- Section 4 provides baseline information on the study area;
- Section 5 identifies the European sites potentially affected by the works;
- Section 6 documents the assessment of the likelihood of significant effects occurring; and,
- Section 7 provides a summary and conclusions.

1.3 The HRA Process

Regulation 63 of the Conservation of Habitats and Species Regulations 2017 requires a competent authority (NRW Marine Licensing Team) before deciding to undertake or give consent for a plan or project which:

a) is likely to have a significant effect on a European site (either alone or in combination with other plans or projects); and

b) is not directly connected with or necessary to the management of that site to make an 'appropriate assessment' of the implications of the plan or project for that site in view of its conservation objectives.

In light of the conclusions of the assessment, the competent authority may proceed with or consent to the plan or project only after having ascertained that it will not adversely affect the integrity of a European site.

All plans and projects should identify any possible effects early in the plan/project making process and then either alter the plan/project to avoid them or introduce mitigation measures to the point where no adverse effects remain. The competent authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and if appropriate having obtained the opinion of the general public.

Figure 1 below provides an overview of the HRA process for projects within or with potential to affect European Sites[1].

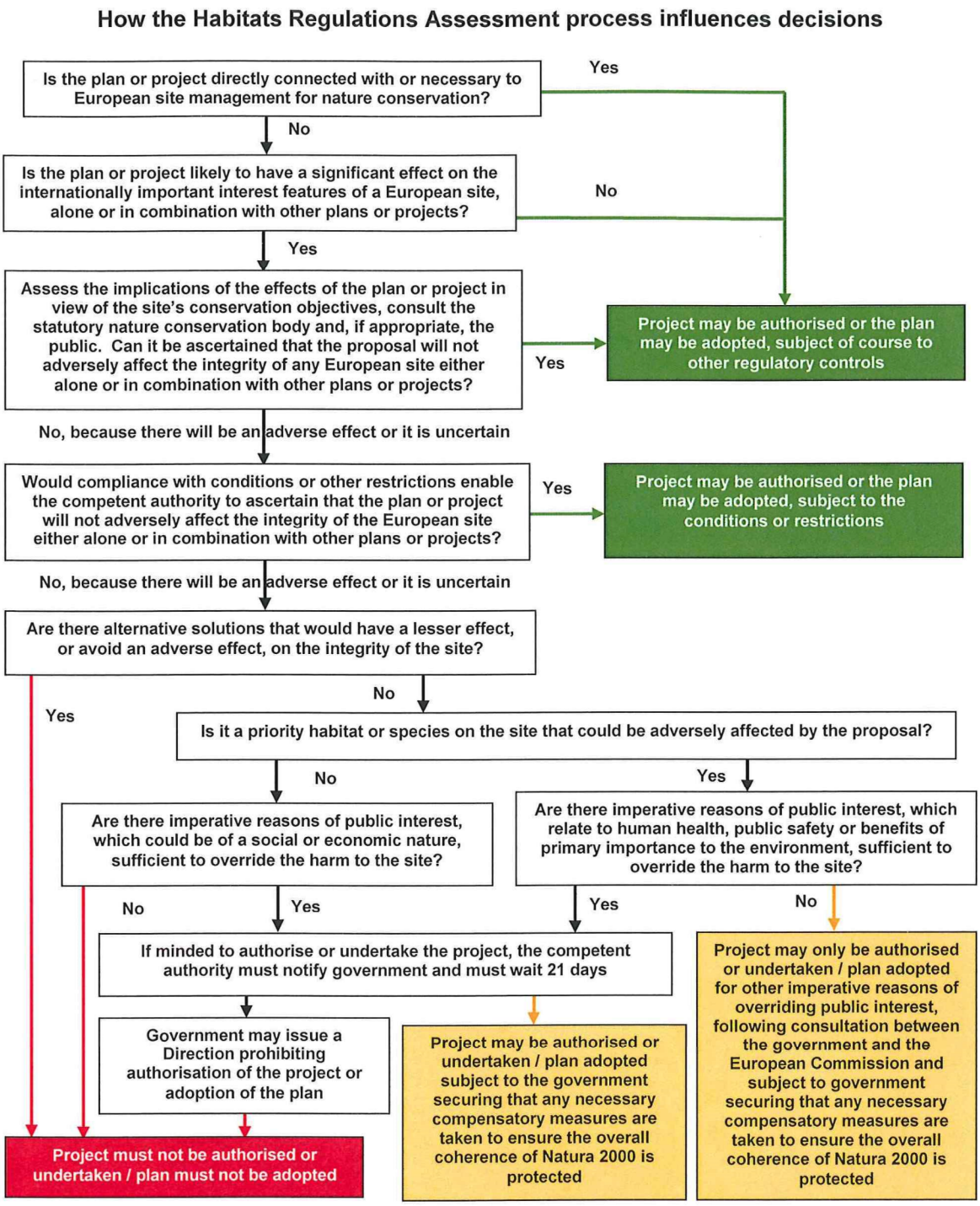
The assessment of a project under the Habitats Regulations can be split into several sections as shown in **Figure 1** however there are effectively four stages to the assessment.

1. Stage 1 is the assessment of the likelihood of a plan or project having a significant effect on a European site or its features; Test of Likely Significant Effect. This is the trigger for the need for an Appropriate Assessment as set out in Regulation 63(1) [Conservation of Habitats and Species Regulations 2017].

[1] Tyldesley & Chapman, 2018. The Habitats Regulations Assessment Handbook, September 2018 Edition, UK: DTA Publications Limited.

2. The Appropriate Assessment (Stage 2) is the detailed consideration of the potential effects of the plan or project in relation to the conservation objectives for the European Site to determine if there is likely to be an adverse effect on the integrity of the site (i.e. an effect that would compromise the site meeting its conservation objectives). Providing it can be demonstrated that with appropriate mitigation measures the plan or project would not give rise to an adverse effect on the integrity of a European site, the plan or project can proceed.
3. Where this cannot be demonstrated or there is uncertainty, the assessment would then need to consider if there were any other alternatives to the plan or project (Stage 3) that would not give rise to adverse effects on integrity of the European site.
4. If there are no alternatives, Stage 4 would then consider if there are any Imperative Reasons of Overriding Public Interest (IROPI) and whether there were any compensatory measures that might be required.

Figure 1 The Habitats Regulations Assessment Process



Extract from *The Habitats Regulations Assessment Handbook*, www.dtapublications.co.uk

2 Project Description

2.1 Background and Rationale

The project is located at the Aberarth Wastewater Treatment Works (WwTW), which now functions as a transfer Sewage Pumping Station (SPS), pumping flows to Aberaeron WwTW. The Aberarth SPS is situated within the town of Aberarth, located to the east of Aberaeron in Ceredigion; approximate National Grid Reference (NGR) SN 47878 64012.

Prior to the Phase 1 works, storm sewage effluent (infrequent flows, circa 10 per annum) from Aberarth SPS was discharged via a long sea outfall; approximately 230m in length. The outfall is aligned north-north-westwards from the SPS under the sea defence wall and is buried beneath the shingle / pebble foreshore before discharging near MLWS; the outfall did not discharge to the consented location.

Phase 1 works installed a new 20m outfall to a new consented discharge point and avoided significant remediation or replacement of the original long-sea outfall. Unforeseen issues with coastal processes led to the consented discharge point becoming untenable, since gravels may migrate across the estuary mouth at this location and cause temporary impoundment. On the rare occasion that this phenomenon coincided with a significant rainfall event that did not remove the impoundment and required an emergency storm discharge, a risk remained that secondary treated outflows could be impounded in an area accessible to local users.

2.2 DCWW Drivers

DCWW have noted the key drivers for realignment works as follows:

- Serviceability – Pollution (Infrastructure).
- Discharges adjacent to Aberarth SSSI and Cardigan Bay SAC.
- Discharge consent compliance.

The issues contributing at this site include:

- The outfall may discharge to an area that may be susceptible to impoundment in certain local conditions.

2.3 Discharge Consent

The Aberarth SPS operates a discharge consent (Consent No. BP0350101) for (01) sewage in an emergency and (02) storm sewage to coastal waters (Cardigan Bay). Discharge is to be via a 150mm diameter pipe to NGR: SN 47893 64105. A copy of the consent is included within Appendix B.

NRW have informally agreed a relocation of the discharge point to the new proposed consent location of SN 47893 64105.

2.3.1 Bathing Water Quality

Aberarth does not have a Bathing Water designation[2]. The closest Bathing Waters are Llanrhystud, approximately 7km to the east and New Quay Bay approximately 9km to the west. Any discharge would be in accordance with the extant discharge consent; in addition, the designated Bathing Waters are of sufficient distance to avoid any effects.

2.4 Consultation

2.4.1 Phase 1 Consultation

The pipeline is located within the intertidal; i.e. between Mean Low Water Springs (MLWS) and Mean High Water Springs (MHWS) tidal limits. Consequently, the need arises to consider both terrestrial and marine planning requirements. An EIA Screening query was issued to Natural Resources Wales' (NRW) Marine Licensing Team on 8th January 2016 (via email) for consideration under the Marine Works (EIA) Regulations 2007 (as amended). NRW Marine Licensing Team responded on 12th January 2016 (via email Reference Number: CRML1608) to inform that the project did not constitute EIA Development and did not require a full EIA, stating: '*I do not envisage this project as having a significant effect on the environment due to its size, nature or location and I would not anticipate that a screening opinion request would be necessary'*.

The NRW Marine Licensing Team response did however state that a Marine Licence application is required to support removal of the redundant outfall pipeline. This is because a section of the redundant outfall is located below the MHWS tidal limits.

The proposed shortened outfall and redundant outfall pipeline are located in close proximity to the Bae Ceredigion / Cardigan Bay Special Area of Conservation (SAC) and the Aberarth - Carreg Wylan Site of Special Scientific Interest (SSSI), within 50m of the boundary. Consequently, consultation was initiated with the relevant NRW Protected Sites Officer and the County Ecologist at Ceredigion County Council; this included invitations to attend a meeting on site to discuss the proposed works.

The relevant NRW Protected Sites Officer has been consulted throughout the development of the proposed solution to ensure the remediation works do not result in likely significant effects on the nearby European site.

An on-site meeting was held with the NRW Protected Sites Officer and NRW Water Quality Officer on 23rd December 2015 to discuss the proposed works. Primary interest from a water quality perspective related to adherence with the current discharge consent, particularly screening of any flows; it is the purpose of this project to attain full compliance with the extant discharge consent.

From a biodiversity perspective, the principal concern related to the distribution of a polychaete worm, *Sabellaria alveolata* (honeycomb worm), that forms localised

[2] http://environment.data.gov.uk/wales/bathing-waters/profiles/index.html?_search=llanr

and sometimes extensive reefs, which significantly increase local biodiversity. Such biogenic reefs are a feature of the SSSI, an Annex I habitat and 'BAP' habitat.

The SAC reef feature includes subtidal and intertidal rocky reef. Furthermore, it could be assumed that this designated habitat also includes mobile reef and biogenic *Sabellaria alveolata* reef.

NRW noted that freshwater influence of the watercourse is likely restricting the *Sabellaria* reef within the vicinity of the pipeline; this was confirmed by the *Sabellaria* reef distribution on the NRW biotope maps (Appendix E1, created c. 1990) and the Intertidal Biotope Survey. Beyond direct effects, NRW identified potential effects via changes in sediment transport following removal of the pipeline, but stated that since the pipe is below-ground, such an effect is unlikely. NRW suggested that if no *Sabellaria alveolata* are present on or in close proximity to the pipeline, any effect on this habitat is considered unlikely.

NRW highlighted the presence of ringed plover (*Charadrius hiaticula*) breeding sites to the north and south of the site recommending consideration of potential mitigation measures following determination of local distribution; NRW suggested breeding is likely from May.

NRW noted potential otter activity along the local watercourse and indicated the potential presence of 'ice lenses', geological features associated with the local Geological Conservation Review (GCR) site and potentially the adjacent SSSIs.

NRW did not express any reservations regarding the removal of the redundant pipeline pending consideration of the aforementioned features. Advice on construction mitigation included minimising the construction width, avoiding any *Sabellaria alveolata* present and ensuring consideration of public safety; it was noted the principal users are local dog walkers.

NRW provided the following supporting data (06/01/2016):

- Otter and Lamprey Survey Report (2012). Trunk Road A487: Aberarth Improvement Phase 2; The Otter Consultancy.
- Intertidal Biotope Plan (1990). Countryside Council for Wales.

2.4.2 Phase 2 Consultation

Following the successful consenting of the Aberarth Phase 1 Remediation works and the limited change and smaller scale of Phase 2, consultation has focused on the local community for which the realignment works will most benefit.

DCWW and the Alliance Project Team met with the Dyffryn Arth Community Council on Monday 8th October 2018 to present and discuss the Phase 2 realignment works. The Community Council resolved that they agreed with the current design and would be supportive of the realignment proposals.

Further engagement will be undertaken following the submission of a marine licence for formal consent for the works.

2.5 Proposed Solution

The revised alignment will include a new 22.5˚ bend seaward of the sea defence wall and a new 20.5m 250mm Outside Diameter (OD) Poly-Ethylene (PE) pipe to the discharge point at SN 47893 64105, and NRV. Rip-rap (small blockstone) and the NRV from the recently upgraded outfall will be retained and reused on the newly proposed solution.

A 6mm 2D static bar screen was installed in the CSO during the Phase 1 (2016) upgrade in order to meet consent on the bypass flows. Appendix C includes drawings of the proposed new infrastructure. All works will be undertaken in accordance with the Risk Assessment and Method Statement (RAMS); Appendix D.

Once the new realigned pipeline has been installed, the existing 20m outfall, situated on Crown Estate land, will be redundant. DCWW are obliged to remove redundant assets from Crown Estate property; as such, the project requires the removal of the redundant pipeline.

In summary the scope includes:

- Installation of 20.5m of new 250mm OD PE outfall pipe with a 200mm thick concrete surround across a depth variance from the surface to circa 1m depth below the shingle and sand.
- Removal of existing 20m of 250mm OD outfall across a depth variance from the surface to circa 1m depth below the shingle and sand.
- Reuse of small blockstone (riprap) and reuse of the NRV (Tideflex) from existing outfall.

2.5.1 Construction of the New Outfall

The initial phase of work will be to construct the new 20.5m outfall pipe. The terminal end of the pipeline will be precast off site, complete with stub pipe, to minimise the construction time on the beach area. The NRV on the existing outfall will be retained and resued on the new realigned outfall.

A small excavator[3] will be used to excavate the pipe terminus before pouring a blinding layer into the base ready to receive the precast terminal end of the pipeline. The blinding will be a rapid set marine grade concrete due to the short working window.

Following installation of the headwall, the 250mm OD PE outfall pipe will be installed with a 200mm minimum thickness of protective concrete surround.

The pipeline section will be constructed in sections using 250mm OD pipe installed using a 1.2m depth box trench ground support system, backfill with as dug material and construction of a concrete protective surround.

[3] Note: the use of the term ‘excavator’, refers to a tracked machine which can rotate 360 degrees and which traditionally uses a bucket attached to an arm for excavation purposes.

During this period small blockstone (rip-rap) will be relocated from the existing outfall to the discharge point to be used as scour protection; this will be installed as per design, refer to Appendix C.

When all the pipeline is in place the flows can be transferred to the new outfall line and the existing line can be decommissioned, a shut down and specific Method Statement will be complied with for this operation.

2.5.2 Removal of Redundant Outfall

This phase will involve removal of 20m of 250mm OD PE pipe at varying depth from circa 1m to ground level at the existing discharge point.

At or just before low tide, vehicles and personnel will access the foreshore from the designated access point and down the beach to the sea outfall location. At all times extreme care will be taken to ensure members of the public are not put at risk of injury.

Vehicles will be loaded with all plant and materials necessary to undertake the works. Minimal quantities of fuels, materials, etc. will be taken on to the foreshore to reduce the risk of pollution. Only tracked vehicles shall be used for this operation, due to the uneven levels of the running surface.

Once at the outfall, the excavator will clear a number of cobbles from the proposed access route to enable plant to reach the outfall. Cobbles will be moved to one side for replacement on completion of the works, but exact replacement of these stones will not be possible.

Working back from the existing discharge point, sections of pipe and concrete surround will be removed and loaded into the tracked dumper for transport to the site compound for storage prior to disposal at a licenced waste disposal site. The existing NRV and rip-rap will be retained and reused on the new alignment to minimise waste. This process will continue towards the shore until the tide is at such a level the works are to be abandoned for that tidal cycle and all materials and plant are removed from the beach area. When demobilising from the beach the location of the end of the existing outfall pipe will be marked to ensure full removal of the pipeline.

This process will be repeated until the whole length of the outfall is removed. The resulting void from the outfall removal will be locally filled in with surrounding material and left to the tide to settle.

It may be necessary to temporarily leave larger sections of broken out concrete or rock on site at the end of a shift if it is not possible to remove fully due to tidal constraints. All small concrete pieces as well as excess and waste materials however will be removed from the beach and disposed of off-site at a suitable licensed facility.

2.5.3 Access

Access and egress to the outfall will be via the DCWW compound, access to the compound will be off the A487 at Aberarth. See **Figure 2** below. Access will

follow the same methodology as used for the licensed works in Phase 1 (2016) to install the current alignment and remove the historic long-sea outfall.

Figure 2: Access/egress locations at Aberarth for the proposed works.

A ramped excavation will need to be constructed to access the lower area of the beach; this will be directly outside the compound where previous works have been undertaken to prevent bank erosion (see **Figure 3** below). It is anticipated that the existing block stone and material will be used for the ramp by removing the top layer of block stone and ramping the ground level above to the lower stone and then pulling the pebbles from the base up to the lower stone constructing a new access ramp. The bank would be reinstated on completion of the works. 8t and 13t tracked excavators will be used for this operation due to the weight of the block stone.

Figure 3: ramped excavation - constructed to access the lower area.

From this point the works area to the beach can be accessed. When on the beach, tides will be monitored to allow suitable programming of the works. After each shift of works are complete, all plant and materials will be removed from the beach area and transported to the DCWW compound.

All plant will be under the control of certified Construction Plant Competence Scheme (CPCS) operators supported by banksmen to control movements to ensure members of the public are not put at risk from plant movements. All plant will be sourced from a trusted reputable company, be inspected prior to use and come with spill kits, for which staff will be trained to use. The contractor will have a Construction Environmental Management Plan (CEMP) which will ensure compliance with Pollution Prevention Guidelines (PPGs).

2.5.4 Accommodating Requirements

A suitable location will be provided within Aberarth as a temporary site compound where a site office and welfare facilities will be located and where plant and materials shall be stored; the compound is anticipated to be within the DCWW existing compound. No plant or materials will be stored on the foreshore or beach areas. The local community will be fully engaged and advised of the project prior to works starting on site via DCWW's External Relations team. For recent community engagement, refer to Section 2.4 above.

2.5.5 Programme and Phasing of Works

Works are planned to commence in late summer 2019 to target optimal weather; however, works may commence in late spring 2019. It is anticipated that due to tidal and weather restrictions the works may be undertaken in a number of phases. Works are proposed to take place outside the winter months to permit sufficient light in-combination with suitable tides.

3 Methodology

This section sets out the guidance and evidence base used in assessing the potential effects of the Project.

3.1 Policy and Guidance

This information has been informed by the following guidance and policy documents:

- Planning Policy Wales - Technical Advice Note (TAN) 5: Nature Conservation and Planning (Welsh Government, 2009);
- The Habitats Regulations Assessment Handbook, September 2018 edition, UK: DTA Publications Limited. (Tyldesley & Chapman, 2018)[1].

This guidance is intended to improve understanding of how projects are regulated under the Habitats Directive. This guidance draws on experience throughout Britain and on case law in Britain and Europe.

3.2 Habitats Regulations Assessment Methodology

3.2.1 Identifying sites

In order to understand the potential implications for European sites from the proposed project it is necessary to identify those sites that are located close to the project or are linked by pathways which could join sources of impacts with European sites.

All European sites and European marine sites within 10km of the proposed works were identified using Geographic Information System data from datasets downloaded from the Joint Nature Conservation Committee (JNCC).

3.2.2 Understanding qualifying interests and conservation objectives

For each of the sites identified the qualifying interests were established and the conservation objectives for each feature were obtained. Information was also sought to understand the potential vulnerability of the features to any effects that might arise from the proposed project.

3.2.3 Identification/characterisation of the potential effects of the Project

The potential effects of the project that could affect the features of European sites were identified and along with identification of routes through which impacts could affect the features. This was done based on the incorporated avoidance and reduction measures set out as part of the project.

3.2.4 Identification of plans or projects considered for in-combination effects

An 'in-combination' assessment is required where the project may have an effect on a European site, but on its own the effects would not be significant. The potential effects of the project should be considered in-combination with other plans or projects that similarly may have an effect, but where on their own those effects would not be significant. The combined effects may therefore become significant.

3.2.5 Consideration of the significance of potential effects

The significance of potential effects was assessed in the absence of avoidance or other mitigation measures. The assessment has been made with awareness of the conservation objectives for the features of the European site(s), although the assessment of the project against the conservation objectives is not required until the Stage 2: Appropriate Assessment stage of the HRA process.

In the assessment of the significance of effects, professional judgement was applied using the following criteria, as often insufficient information about the elements and interests is available:

- The vulnerability/sensitivity of the receiving environment/features of interest;
- When the risk of effects are likely to occur (e.g. construction and/or operation);
- The likely geographical extent of the effects; and
- Likelihood of significant effects (e.g. those above negligible in magnitude) occurring based on previous experience with similar elements, where available.

4 Baseline Information

4.1 Information Sources

WWBIC (West Wales Biodiversity Information Centre) provided details of protected habitats and species to inform the baseline prior to undertaking the Intertidal Biotope Survey. The search was carried out up to 2km of a site centre point (NGR: SN4789664088).

In addition, the following websites and information sources were used to gather information on the European protected sites;

- Natural Resources Wales (NRW) website[4];
- MAGIC (Multi-Agency Geographic Information for the Countryside) website[5];
- JNCC website[6],
- Cardigan Bay SAC website[7], and,
- Trunk Road A487 Aberarth Improvement Phase 2: Otter & Lamprey Report [8].

A desk-top assessment has been carried out based on relevant and available information to gain a more thorough understanding of the site and to inform subsequent surveys.

The MAGIC website was used to identify statutory sites within the vicinity of the Project. A search radius of 10km was employed for European sites. The NRW and JNCC websites provided details and descriptions of protected sites, with cross-reference to maps and citations.

4.1.1 Designated Sites

As stated, the proposed works will be undertaken adjacent to the Cardigan Bay / Bae Ceredigion Special Area of Conservation (SAC), details of the site's features are described in Section 5.1. **Table 1** presents the European sites identified for assessment within the search area; Appendix A3 displays the environmental constraints in relation to Aberarth Outfall.

[4] http://naturalresources.wales
[5] http://magic.defra.gov.uk/MagicMap.aspx
[6] http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUcode=UK0013116
[7] http://www.cardiganbaysac.org.uk
[8] Liles, G., 2012. *Trunk Road A487 Aberarth Improvement Phase 2: Otter & Lamprey Report*. The Otter Consultancy. Carmarthenshire.

Table 1: European Sites Potentially Affected by the Project

European Site	Features	Distance from Proposed Works
Cardigan Bay / Bae Ceredigion SAC	**Annex I habitats** present as a qualifying feature, but not a primary reason for selection of this site: • Sandbanks which are slightly covered by sea water all the time • Reefs • Submerged or partially submerged sea caves **Annex II species** that are a primary reason for selection of this site: • Bottlenose dolphin *Tursiops truncatus* **Annex II species** present as a qualifying feature, but not a primary reason for site selection • Sea lamprey *Petromyzon marinus* • River lamprey *Lampetra fluviatilis* • Grey seal *Halichoerus grypus*	<50m
West Wales Marine cSAC	Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them: • Harbour porpoise *Phocoena phocoena*	130m

As described in Section 2.4, the relevant NRW Officers were consulted to ensure the initial remediation works do not result in likely significant effects. No change in construction methods, a smaller working area and shorter timescales are proposed; as such, no change in assessment is anticipated.

An Extended Phase 1 Habitat Survey and Intertidal Biotope Survey was undertaken on 23 December 2015 to inform the ecological conditions and potential constraints that exist on the current site. The outcome of the initial surveys is such that an updated survey was anticipated to yield a change in baseline. The proposed works area experiences frequent erosion and intense salinity variation and has negligible conspicuous flora or fauna. Freshwater influence and erosion from cobble and shingle movement maintain an adequate separation distance from the works area and a nearby *Sabellaria alveolata* (honeycomb worm) reef. No expansion of the reef towards the works area is anticipated in the intervening period. No evidence of sensitive features has been identified in recent walkovers.

4.1.2 Desk Study Results

Relevant Biodiversity Records data was reviewed in relation to the Cardigan Bay / Bae Ceredigion SAC as summarised below.

No marine mammals were returned from the WWBIC search, despite the proximity of the West Wales Marine cSAC and Cardigan Bay SAC being designated for harbour porpoise and breeding and foraging populations of the bottlenose dolphins respectively. Grey seals are a qualifying feature of the Cardigan Bay SAC, but not a primary reason for site selection; no haul out or breeding areas are present near the proposed works.

Lampreys are listed as Annex II species (present as a qualifying feature, but not a primary reason for site selection) for the Cardigan Bay SAC. A Phase II report for otter and lamprey prepared by the Otter Consultancy in 2012[8] highlighted that this species has not previously been recorded in the River Arth. Furthermore, no records for lampreys were returned from WWBIC.

4.1.3 Extended Phase 1 Habitat Survey

Common terrestrial and intertidal habitats were recorded during the Extended Phase 1 Habitat survey. A total of eleven habitat types were identified within the site and immediately adjacent to the site:

- Dense scrub (A2.1);
- Scattered scrub (A2.2);
- Running Water (G2);
- Intertidal shingle/cobbles (H1.2);
- Brown algal beds over intertidal boulders/rocks (H1.3.3);
- Coastal grassland (H8.4);
- Amenity grassland (J1.2);
- Fence (J2.4);
- Wall (J2.5);
- Sea wall (J3.5);
- Buildings (J3.6).

The survey identified *Sabellaria alveolata* reef 62m east of the redundant pipeline; the reef will be circa 120m from the new realignment works. The worm casts appeared to be in good condition, with little sign of human trampling and storm damage. Good numbers of open and expected active casts were recorded showing the reef is in a healthy condition. No terrestrial or intertidal invasive species were recorded during the survey.

4.1.4 Intertidal Biotope Survey

An Intertidal Biotope Survey was undertaken along the redundant and new outfall alignments on 23rd December 2015 at the lowest available tidal state; low water at c. 12:00; c. 1.28m above CD. The survey was undertaken by two experienced marine ecologists in good weather conditions.

The NRW Intertidal Biotope Plan (created c. 1990) and a JNCC Phase 1 Habitat Plan are presented in Appendix E1 and Appendix E2 respectively.

As described above, negligible flora and fauna were encountered within the proposed works area, as such, an updated survey was not deemed to be worthwhile due to the physical and chemical pressures within the works area; re. erosional processes and extreme salinity variation within the mouth of the Avon Arth.

4.1.4.1 Methodology

The survey was undertaken in accordance with the JNCC's Marine Nature Conservation Review (MNCR)[9] methodology, which was developed to provide a comprehensive baseline of information on marine habitats and species, to aid coastal zone and marine management and to contribute to the identification of areas of marine natural heritage importance throughout Great Britain. MNCR focussed on benthic habitats and their associated communities, which together are described as 'biotopes'.

The MNCR developed methods for survey, assessment and recording to enable systematic and consistent descriptions of the character of habitats present and the abundance of species in them so that comparisons between sites could be undertaken.

In accordance with MNCR guidance[10] an intermediate-level survey was considered appropriate to describe baseline conditions. This enabled a rapid assessment of habitats and conspicuous fauna, between Mean High Water Springs (MHWS) and MLWS, in addition to physical characteristics of the site and potential modifiers. Core sampling, sieving and sediment size analysis was not considered feasible or necessary for this assessment. Abundances are described according to the SACFOR scale, which in summary is as follows: Superabundant (>80%), Abundant (40-79%), Common (20-39%), Frequent (10-19%), Occasional (5-9%), Rare (1-5%) and Present (<1%).

Table 2 below presents the species identified during the Intertidal Biotope Survey and the biotopes and zonation observed. Appendix F1 provides photos of the proposed pipeline route and discharge point. Appendix F2 provides photos of the obsolete pipeline route.

[9] Further information available at: http://jncc.defra.gov.uk/default.aspx?page=1596
[10] JNCC. (2001). MNCR: Guidance notes for the completion of field recording forms.

4.1.4.2 Limitations

The survey was undertaken outwith the recommended months of April to October[11]. The advisory survey period typically permits suitable daylight hours around spring tides, better weather and spring growth. At the time of survey (23 December 2015) the weather was unusually mild and the weather at the time of survey was warm (approximately 10°C) and sunny with light showers. The survey was timed to take advantage of the lowest tides of the month (1.28m ACD) with the biotopes in the vicinity of MLWS assessed at the lowest tidal state (c. 12:00 GMT). Access to the end of the redundant long-sea outfall was not possible due to the tidal state; only the last c.10m were not surveyed, however, photos are available from previous field visits. It is therefore considered that the biotopes and species identified are representative.

4.1.4.3 Survey Findings

The frontage at Aberarth is dominated by coarse sediments, predominantly cobbles underlain by sand. The well-sorted substrate, typical of a storm beach, demonstrates the exposed nature and frequent intense wave activity along this stretch of coastline. The existing pipeline is buried near the surface alongside the mouth of the River Arth, which has a strong influence on the habitats present.

The combination of the exposure along the existing pipeline route and the significant freshwater influence has severely diminished the capacity of the location to harbour good quality habitat. The recently installed pipeline is devoid of any conspicuous biota. Whilst the high mobility of the cobble substrate prohibits mobile fauna and restricts sessile flora and fauna through attrition, the reduced salinity is seen to be the major factor in reducing habitat quality. This is evidenced by the presence of *Sabellaria alveolata* (honeycomb worm) reef circa 120m to the north-east of the proposed works area; this buffer distance is attributed primarily to freshwater influence.

Of the immediate and wider works area, the majority of substrate is devoid of obvious biota, the remainder is represented by very low biotic coverage and low species richness; all species identified are commonly occurring and considered to be of low conservation value. Table 2 below identifies the biotopes present and the species encountered alongside their abundance values in accordance with the methodology prescribed in Section 4.1.4.1.

The Phase 1 (2016) pipeline, which is due to be removed, is located entirely above Mean High Water Springs (MHWS) and is characterised solely by large cobbles and is devoid of any obvious flora or fauna.

[11] CCW. (date unknown). Handbook for Marine Intertidal Phase 1 Biotope Mapping Survey.

Table 2: Biotope Zonation Summary

Summary Description	Biotope Description	MNCR Biotope	Characteristic Species Present (Average Abundance)
Removal - Recently Installed Redundant Pipeline (all above MHWS)			
Supralittoral Fringe (Spray zone) - Sea wall.	Grey lichens on supralittoral rock	Phase 1: H8.4. LR.FLR.Lic.YG	*Caloplaca spp.* (O)
Upper Littoral Fringe - Intertidal shingle cobbles.	Barren littoral shingle	Phase 1: H1.2 LS.LCS.Sh.BarSh	No obvious biota present. Only strandline material; e.g. *Ascophyllum nodosum* and *Scyliorhinus stellaris* (egg-case).
Installation - Proposed Realigned Pipeline			
Supralittoral Fringe (Spray zone) - Sea wall.	Grey lichens on supralittoral rock	Phase 1: H8.4. LR.FLR.Lic.YG	*Caloplaca spp.* (O)
Littoral Fringe (Upper and Lower) - Intertidal shingle cobbles.	Barren littoral shingle	Phase 1: H1.2 LS.LCS.Sh.BarSh	No obvious biota present. Only strandline material; e.g. *Ascophyllum nodosum* and *Scyliorhinus stellaris* (egg-case). Freshwater influence as overland flow; from mouth of River Arth (Afon Arth).
Additional Biotopes Present in Vicinity (northern gradation beyond proposed works area)			
Eulittoral – Upper & Middle (Intertidal zone) - Exposed shingle and cobbles over sand and bedrock with occasional tide pools.	*Corallina officinalis* and coralline crusts in shallow eulittoral rockpools (circa 50m north of works area)	Phase 1: H1.2 LR.FLR.Rkp.Cor.Cor	*Ulva intestinalis* (R) *Corallina officinalis* (O) *Mastocarpus stellatus* (R)

Summary Description	Biotope Description	MNCR Biotope	Characteristic Species Present (Average Abundance)
Eulittoral – Lower (Intertidal zone) - Boulders with brown seaweeds and barnacles; greater diversity and abundance of seaweed and fauna.	*Semibalanus balanoides* and *Littorina* spp. on exposed to moderately exposed eulittoral boulders and cobbles (circa 100m north of works area)	Phase 1: H1.3.3 LR.HLR.MusB.Sem.LitX	*Ulva intestinalis* (R) *Corallina officinalis* (F) *Mastocarpus stellatus* (O) *Semibalanus balanoides* (R) *Littorina littorea* (O) *Mytilus edulis* (R) *Patella depressa* (O) Note: presence of gammarids *Gammaridae* under boulders (O)
Eulittoral – Lower (Intertidal zone) - Exposed cobbles and boulders with biogenic *Sabellaria* reef	Littoral *Sabellaria* honeycomb worm reefs (c. 120m north-east of works area, beyond freshwater influence)	Phase 1: H1.3.3 LS.LBR.Sab	*Ulva intestinalis* (F) *Ulva lactuca* (R) *Corallina officinalis* (C) *Mastocarpus stellatus* (C) *Ralfsia* sp. (F) *Fucus spiralis* (F) *Semibalanus balanoides* (C) *Chthamalus* spp. (P) *Gibbula umbilicalis* (C) *Littorina littorea* (C) *Mytilus edulis* (F) *Patella depressa* (F) *Patella vulgata* (O) *Pomatoceros sp.* (O) *Sabellaria alveolata* (A)

4.2 Identification of Other Plans and Projects

DCWW are not aware of any other plans or projects that have the potential to lead to in-combination effects with the proposed works. No plans or projects were identified from the Ceredigion County Council website[12] that have the potential to lead to in-combination effects with the proposed works.

Consequently, no additional plans or projects were identified that may lead to in-combination effects with the proposed works.

12 http://www.ceredigion.gov.ukhttp://www.pembrokeshirecoast.org.uk/default.asp?PID=506

5 European Sites Potentially Affected by the Scheme

The proposed works are located immediately adjacent to the Cardigan Bay / Bae Ceredigion SAC and within the vicinity of the boundary to the West Wales Marine cSAC. The features of these sites are described in more detail below, whilst the conservation objectives that have been taken into account during the assessment are presented in Section 5.1.1 and 5.2.1 below.

5.1 Cardigan Bay / Bae Ceredigion SAC

Cardigan Bay has long been recognised for its marine conservation importance. The habitat features are characterised by complex interrelationships with and between biotic and abiotic functional (environmental) processes and species populations. It is the combination of all these components together which gives the overall importance to the habitat features of the site. Each of these individual components contributes to the integral, global importance of each feature, and each of the features contributes to the importance of the site.

The Cardigan Bay SAC is a multiple interest site that has been selected for the presence of three marine Habitats Directive Annex I habitat types and four Habitats Directive Annex II species. These are:

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:

- Sandbanks which are slightly covered by sea water all the time;
- Reefs; and,
- Submerged or partially submerged sea caves.

Annex II species that are a primary reason for selection of this site:

- Bottlenose dolphin.

Annex II species present as a qualifying feature, but not a primary reason for site selection:

- Sea lamprey;
- River lamprey; and,
- Grey seal.

The Natura 2000 data form[13] for the Cardigan Bay / Bae Ceredigion SAC identifies vulnerability for factors such as marine water quality pollution incidents, soil pollution and solid waste and other human intrusions and disturbances. More physical concerns are described as certain fishing methods and harvesting of aquatic resources to which marine communities are vulnerable to damage and would occur over a wide area. Invasive non-native marine species are

[13] Natura 2000 (2015). *Cardigan Bay / Bae Ceredigion SAC – Standard Data Form*. UK0012712. Joint Nature Conservation Committee. Peterborough.

also deemed a threat to the SAC; none were identified during the Intertidal Biotope Survey.

5.1.1 Conservation Objectives

5.1.1.1 Habitat Features - Range

The overall distribution and extent of the habitat features within the site, and each of their main component parts is stable or increasing. For the reef feature these include:

- Intertidal bedrock reefs.
- Intertidal cobble, pebble with *Sabellaria alveolata* (biogenic) reefs.
- Subtidal bedrock reefs.
- Subtidal pebble, cobble and boulder reefs.
- Sea caves.

5.1.1.2 Habitat Features - Structure and Function

The physical biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded. Important elements include:

- Geology,
- Sedimentology,
- Geomorphology,
- Hydrography and meteorology,
- Water and sediment chemistry,
- Biological interactions.

This includes a need for nutrient levels in the water column and sediments to be:

- At or below existing statutory guideline concentrations.
- Within ranges that are not potentially detrimental to the long term maintenance of the features species populations, their abundance and range.

Contaminant levels in the water column and sediments derived from human activity to be:

- At or below existing statutory guideline concentrations.
- Below levels that would potentially result in increase in contaminant concentrations within sediments or biota.
- Below levels potentially detrimental to the long-term maintenance of the feature species populations, their abundance or range taking into account bioaccumulation and biomagnification.

5.1.1.3 Habitat Features - Typical Species

The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded. Important elements include:

- Species richness,
- Population structure and dynamics,
- Physiological heath,
- Reproductive capacity,
- Recruitment,
- Mobility,
- Range.

As part of this objective it should be noted that:

- Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum sustainable yield and secure in the long term.
- The management and control of activities or operations likely to adversely affect the habitat feature is appropriate for maintaining it in favourable condition and is secure in the long term.

5.1.1.4 Species Features - Populations

The population is maintaining itself on a long-term basis as a viable component of its natural habitat. Important elements include:

- Population size.
- Structure, production.
- Condition of the species within the site.

As part of this objective it should be noted that for bottlenose dolphin / grey seal:

- Contaminant burdens derived from human activity are below levels that may cause physiological damage, or immune or reproductive suppression.

For grey seal populations should not be reduced as a consequence of human activity.

5.1.1.5 Species Features - Range

The species population within the site is such that the natural range of the population is not being reduced or likely to be reduced for the foreseeable future.

As part of this objective it should be noted that for bottlenose dolphin / grey seal:

- Their range within the SAC and adjacent inter-connected areas is not constrained or hindered
- There are appropriate and sufficient food resources within the SAC and beyond
- The sites and amount of supporting habitat used by these species are accessible and their extent and quality is stable or increasing

5.1.1.6 Species Features - Supporting Habitats and Species

The presence, abundance, condition and diversity of habitats and species required to support this species is such that the distribution, abundance and populations dynamics of the species within the site and population beyond the site is stable or increasing. Important considerations include:

- Distribution, Extent, Structure,
- Function and quality of habitat,
- Prey availability and quality.

As part of this objective it should be noted that:

- The abundance of prey species subject to existing commercial fisheries needs to be equal to or greater than that required to achieve maximum sustainable yield and secure in the long term.
- The management and control of activities or operations likely to adversely affect the species feature is appropriate for maintaining it in favourable condition and is secure in the long term.
- Contamination of potential prey species should be below concentrations potentially harmful to their physiological health.
- Disturbance by human activity is below levels that suppress reproductive success, physiological health or long-term behaviour.

5.1.1.7 Species Features - Restoration and Recovery

As part of this objective it should be noted that for the bottlenose dolphin populations should be increasing.

5.2 West Wales Marine / Gorllewin Cymru Forol cSAC

The West Wales Marine / Gorllewin Cymru Forol pSAC covers an area of 7,377 km^2 extending southwards from the western end of the Llyn Peninsula across Cardigan Bay to Pembrokeshire. The draft conservation objectives[14] have been reviewed with key information summarised below.

Seasonal differences in the relative use of the site have been identified based on the analyses of Heinänen and Skov (2015) which shows that harbour porpoise occur in elevated densities in the whole of the site during summer and in a part of the site in Cardigan Bay during winter (Figure 4).

14 http://jncc.defra.gov.uk/pdf/WestWalesMarineConservationObjectivesAndAdviceOnActivities.pdf

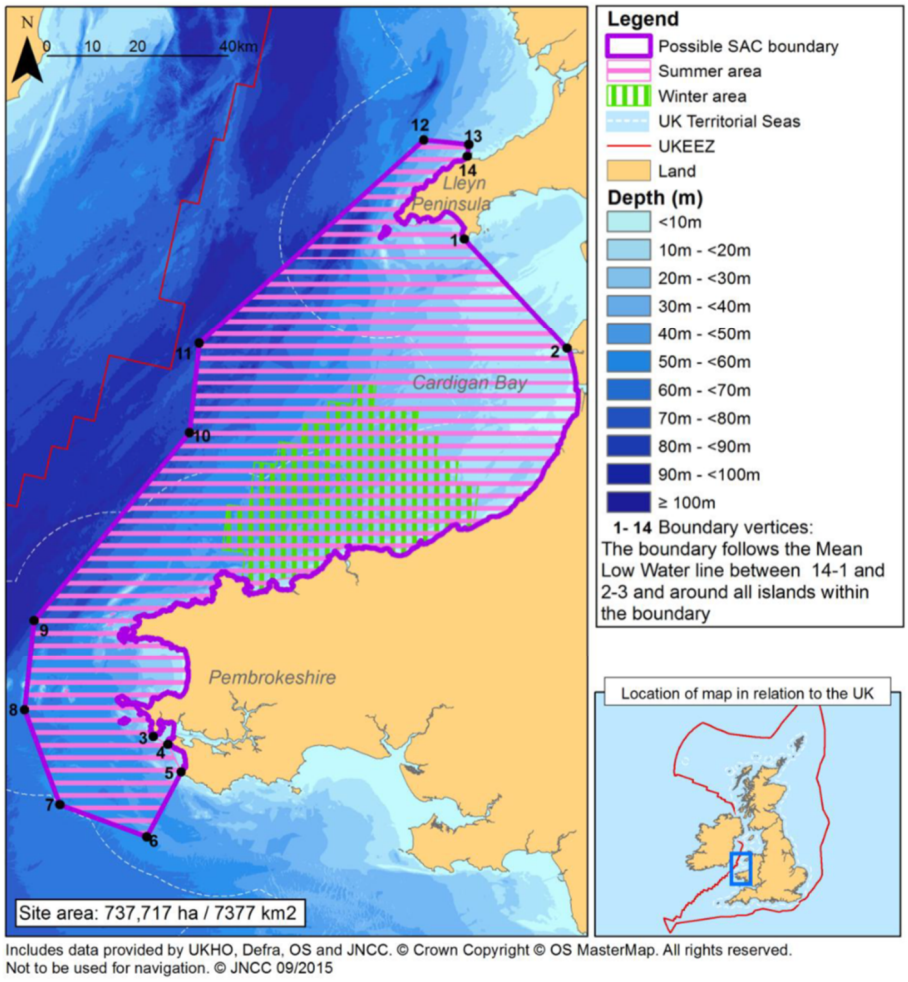


Figure 4 - The West Wales Marine / Gorllewin Cymru Forol possible Special Area of Conservation for harbour porpoise showing summer and winter areas; ref. http://jncc.defra.gov.uk/pdf/WestWalesMarineConservationObjectivesAndAdviceOnActivities.pdf

5.2.1 Conservation Objectives

'To avoid deterioration of the habitats of the harbour porpoise or significant disturbance to the harbour porpoise, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to maintaining Favourable Conservation Status (FCS) for the UK harbour porpoise.

To ensure for harbour porpoise that, subject to natural change, the following attributes are maintained or restored in the long term:

[1] The species is a viable component of the site. [2] There is no significant disturbance of the species. [3] The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.'

5.2.2 Sensitivities

Due to the terrestrial / intertidal nature of the proposal, limited pathways for effect on harbour porpoise are identified through the sensitivities matrix. The closest fit relates to discharges and has been transposed into Table 3 below.

Table 3 West Wales Marine cSAC – Sensitive Activities

Activities	Pressures	Impacts	Current Relative Level of Impact
Discharge/ run-off from land-fill, terrestrial/ offshore industries	Contaminants – Current exposure within or near the site is unknown	• Effects on water and prey quality. • Bioaccumulation through contaminated prey ingestion. • Health issues (e.g. on reproduction).	High - This pressure generally cannot be managed effectively at the site level. Most of the pollutants of relevance to marine mammals have been effectively phased out of use by action under the OSPAR Convention and, more recently, the EU (e.g. PCBs). However, human activities may cause the re-release of these chemically stable chemicals into the environment or introduce other contaminants of which the impacts are poorly known. Any novel sources of potential contamination associated with a new plan or project may be assessed under HRA. It is recognised that further efforts to limit or eliminate discharges to the marine environment may still be needed.

6 Stage 1: Screening Assessment

6.1 Potential Pathways for Effect

The potential effects of the scheme are as follows:

- Direct habitat loss – no works or access proposed within the SAC.
- Water quality effects during construction phase; e.g. pollution event.
- Water quality effects during operational phase.
- Temporary disturbance.

6.2 Habitat Features

The Cardigan Bay SAC Management Plan and website describe: '*sandbanks which are slightly covered by sea water all the time*' as being located to the north of Aberaeron and thus approximately 3km distant; '*submerged or partially submerged sea caves*' located approximately 5km south[15]; whilst the reef feature is relatively prominent along much of the coastline in the SAC. As such potential effects are only considered in relation to the adjacent reef feature with the remainder considered to have sufficient spatial separation to avoid any effects.

6.2.1 Range

No works or access will be undertaken within the SAC; the River Arth acts as a physical barrier that will avoid any unintentional access into the SAC. As such, no direct impacts are predicted on the SAC and no effect predicted on the overall distribution and extent of the habitat features within the site.

Installation of the realigned pipeline will occur in close proximity to the SAC boundary, although works will be separated by the River Arth, significant coastal defence works (photographs in Appendix F1 provide context) and a number of groynes; including a wooden groyne providing physical separation from the proposed works on the opposite side of the river. The physical works footprint and the dimensions of the access corridor will be reduced as far as practicable and will be significantly smaller than the 2016 Phase 1 remediation works, which involved removal of the long-sea outfall.

It is therefore considered reasonable to conclude that the proposed works would have **no effect** on the overall distribution and extent of the habitat features within the SAC.

6.2.2 Structure and Function

Removal of the existing 20m PE pipeline is not considered to have an adverse effect on coastal processes and may lead to a betterment, allowing a more natural flow regime from the Afon Arth. The pipeline is shallow, varying between the

[15] http://www.cardiganbaysac.org.uk/wp-content/uploads/2015/11/Cardigan-Bay-seacaves.jpg

surface at the discharge point and up to 1m depth at the connection point, and is relatively small in diameter (250mm OD).

A Risk Assessment and Method Statement (RAMS; Appendix D) will manage construction activities in line with best construction environmental practice, compliance with GPP5 etc., as is standard for all DCWW projects.

As described in Section 2.5, site-specific methods will ensure that all site activities are controlled and are in accordance with standard operating procedures; e.g. Pollution Prevention Guidelines (PPG) and CIRIA best practice. All plant will be sourced from a trusted reputable company and will come with spill kits which site personnel will be trained to use. Vehicles will be loaded with all plant and materials necessary to undertake the works to minimise plant movements below MHWS. Minimal quantities of fuels, materials, etc. will be taken on to the foreshore to reduce the risk of pollution. All storage containers will remain within the site compound and be appropriately bunded to prevent any spillages or leaks. No storage of materials or refuelling operations will be permitted outside the site compound.

Prefabrication of the pipe terminus, complete with stub pipe and re-purposed tide flex valve, will minimise construction time on the beach area. Concrete requirements will be met by rapid hardening marine-grade concrete to provide long-term protection and reduce the potential for leachate by utilising a marine specific product. When all the pipeline is in place the flows can be transferred to the new outfall line and the existing line can be decommissioned, a formal DCWW shut down and specific Method Statement will be complied with for this operation.

Sections of removed pipe and concrete surround will be loaded into the tracked dumper for transport to the site compound for storage prior to disposal at a licenced waste disposal site. This process will continue towards the shore until the tide is at such a level the works are to be abandoned and all materials and plant are removed from the beach area. The resulting hollow from the outfall removal will be locally filled in with surrounding material and left to the tide to settle.

No change in operational indirect effects are predicted following installation of the new shortened outfall, consent conditions relating to quality, quantity and composition of the discharge will remain unchanged. No evidence of any nutrient enrichment has been evident during any site visits, e.g. green algal mats; this is likely due to the low frequency of spills and relatively low volume combined with effective dilution by the River Arth and the exposed nature of the coastline. Since the proposed works will operate in full compliance with the extant discharge consent, no adverse change in water quality is predicted. By removing the minor risk of impoundment of certain discharges, a positive effect in water quality is anticipated following completion of the works.

Construction management and operational transfer are DCWW standard activities and are not considered herein as additional mitigation necessary to avoid likely significant effects on the reef feature; as such, this is considered a standard protocol and not a mitigation measure necessary for avoidance, cancellation or reduction of any potential effects on the reef feature. In the absence of such

measures, no effect on the reef feature would be anticipated due to spatial separation and effective dilution by the Afon Arth and local tidal regime.

Following integration of these plainly established and uncontroversial best practice measures, it is therefore considered reasonable to conclude that there would be **no effect** on the physical biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat.

6.2.3 Typical Reef Species

As described above, no direct effects are predicted since no works will be undertaken within the SAC. Indirect effects during construction will effectively be cancelled by the provision of standard construction good practice as described above and operational water quality will be maintained or improved in the long-term.

As described in Section 4.1.3.2, much of the foreshore habitat within the proposed working area and vicinity thereof, is devoid of conspicuous flora and fauna and that which is present is of low abundance, low species richness and low conservation value.

The Intertidal Biotope Survey confirmed that no *Sabellaria alveolata* reefs were present within the construction area; despite the fact that these would have been located outside the SAC. The freshwater influence of the River Arth discourages development of this habitat but reappears circa 120m to the northeast of the proposed working area.

It is therefore considered reasonable to conclude that the proposed works would have **no effect** on the presence, abundance, condition and diversity of typical species of the habitat features within the SAC.

6.3 Species Features

Mobile features of the SAC may be present outside the boundary of the protected site and thus potentially at risk from the remediation works. However, each of these are predominantly marine species, whilst the works will be undertaken onshore.

West Wales Biodiversity Information Centre records data and the Otter and Lamprey Survey Report 2012 (The Otter Conservancy)[8], evidence that sea lamprey and river lamprey are not utilising the River Arth and so are unlikely to be affected by the proposals (Appendix G). Furthermore, lamprey are regarded as 'non-specialists' with respect to hearing ability, since they do not possess a swim-bladder and therefore are not regarded to be sensitive to acoustic effects (Popper, 2005)[16].

Both bottlenose dolphin, harbour porpoise and grey seal are transitory in nature so should individuals be present in the vicinity of construction works they would be able to relocate away from any disturbing activities. No special features are

[16] Popper, A. 2005. Environmental Bioacoustics. A Review of Hearing by Sturgeon and Lamprey.

evident at Aberarth that would provide essential functions to these features. No grey seal haul out or nursery areas have been identified within the vicinity of the works. Seals often pup within sea caves on exposed coasts; however, the closest sea cave is 5km south of the site[17]. Evidence suggests that the area around Aberarth maintains an aggregation of harbour porpoise during the winter (refer to Section 5.2 above); works will not be scheduled during the winter months to target more favourable weather conditions and to ensure reasonable hours of daylight to undertake the works safely.

Construction activities will be localised and of short duration with no works within the marine environment; all works will be terrestrial with no pathway for any marine noise or vibration effects. No potential for water quality effects from construction or operation are likely, primarily through the use of trusted competent contractors that adhere to best construction practices and compliance with NRW approved discharge consent. As such no pathway for effect with species features of the SAC, or dependent prey features, have been identified.

It is therefore considered reasonable to conclude that the proposed works would have **no effect** on the long-term maintenance of bottlenose dolphin or grey seal populations, the natural range of their populations or the presence, abundance, condition and diversity of habitats and species required to support the species features of the SAC.

In respect of harbour porpoise, it is considered reasonable to conclude that the proposed works would not lead to a deterioration of dependent habitats or processes, relevant to either harbour porpoises or their prey, or lead to significant disturbance, and that the works would maintain the ability of the site to continue to deliver an appropriate contribution to FCS.

6.4 Embedded Mitigation (Standard Practices)

The mitigation integrated into the project includes the following:

- Early engagement with NRW (Protected Sites Officer and Water Quality Officer) and the Ceredigion County Council Ecology Officer.
- Full compliance with the NRW discharge consent; no change in quality, quantity and composition of the discharge or change in baseline spill frequency. Relocation of discharge point to improve dilution and effusion during spill events.
- Implementing design that presents a sustainable solution; i.e. provision of a shortened 20.5m outfall rather than reinstatement of the original 230m long-sea outfall.
- Limiting the physical works footprint and the dimensions of the access corridor as far as reasonably practicable.
- Ensuring best practise during construction: site-specific methods will ensure that all site activities are controlled and are in accordance with standard

[17] http://www.cardiganbaysac.org.uk/?page_id=578

operating procedures; e.g. Pollution Prevention Guidelines (PPG) and CIRIA best practice.

- All plant will be sourced from a trusted reputable company and will come with spill kits which site personnel will be trained to use.
- Utilising a marine specific product; rapid set marine grade concrete.
- Vehicles will be loaded with all plant and materials necessary to undertake the works to minimise plant movements below MHWS.
- Minimal quantities of fuels, materials, etc. will be taken on to the foreshore.
- All storage containers will remain within the site compound and be appropriately bunded to prevent any spillages or leaks. No storage of materials or refuelling operations will be permitted outside the site compound.

6.5 Additional Mitigation

No specific mitigation measures are proposed to avoid, cancel or reduce potential effects on European Site features to allow determination of a no likely significant effect conclusion. I.e. in the absence of standard best construction practice, the small scale, localised and temporary nature of the works would not be considered to lead to likely significant effects on European Sites or their respective features.

7 Conclusion

DCWW are undertaking works at the Aberarth outfall to improve the operational nature of the outfall whilst maintaining full compliance with the extant NRW discharge consent. The proposed solution involves construction of a new shortened 20.5m outfall to realign the discharge point from the extant 20m outfall, which will be removed as part of the works.

The new outfall will be fully compliant with the NRW discharge consent, which will maintain or improve operational water quality. The duration of works, although restricted by suitable tidal windows, will be localised, short and temporary in nature; all works will be terrestrial with no pathway for any marine noise or vibration effects.

No works or access will be undertaken within the Cardigan Bay SAC; as such, no direct effects are predicted during construction. No potential for water quality effects from construction or operation are likely, primarily through the use of trusted competent contractors that adhere to best construction practices and compliance with NRW approved discharge consent.

No additional plans or projects were identified with the potential to incur in-combination effects with the proposed works.

Consequently, it is considered reasonable to conclude that there are no likely significant effects, either alone or in-combination with other plans and projects, resulting from the proposed works.

Given the conclusion that the works will not have a likely significant effect, the requirement to complete an appropriate assessment has not been triggered. Consequently, the proposed works are not considered to be contrary to the provisions of Regulation 63 of the Conservation of Habitats and Species Regulations 2017.

Appendix A

Site Plans

A1 Site Location Plan

A1

OS REF: 247893, 264078

N

ORIGINAL LONG-SEA
OUTFALL DISCHARGE POINT
(247803, 264289)

ORIGINAL LONG-SEA OUTFALL (REMOVED DURING PHASE 1 WORKS, 2016) 230m OF 225mm DIA CI SEA OUTFALL PIPE

MEAN LOW WATER

MEAN HIGH WATER

SHINGLE

BREAKWATERS

SHINGLE

MHW

DW

SHINGLE

AFON ARTH

PUBLIC FOOTPATH TO BEACH

ABERARTH SEWAGE PUMPING STATION COMPOUND

ACCESS GATE ABERARTH SPS

ACCESS GATE TO BEACH VIA FIELD

EXTANT 20M OF 250mm DIA PE OUTFALL

COEDMOR

ARLON Y MOR

Ha/Awen

SITE PLAN

SCALE 1:500

1:500 5m 10m 15m 20m 25m 30m 35m 40m 45m 50m

N

SITE LOCATION PLAN

SCALE 1:25,000

LEGEND

- ASSUMED POSITION OF EXISTING OUTFALL
- EXISTING RISING MAIN (TAKEN FROM WELSH WATER ASSET INFORMATION SYSTEM)
- EXISTING COMBINED SEWER (TAKEN FROM WELSH WATER ASSET INFORMATION SYSTEM)

Rev.	Date.	Drawn.	Description.	Chkd.	Appd.	Date.
C1	12.02.16	CF	FOR COSTING	RC	MU	12.02.16

Capital Delivery Alliance
Cynghrair Cyflawni Cyfalaf
Ty Awen, Spooner Close, Coed Kernew, Newport, NP10 8FZ

Project Name.: ABERARTH OUTFALL 4692.S.203

Drawing Title.: LOCATION PLAN

Suitability.: FOR COSTING — Suitability Code.: D1

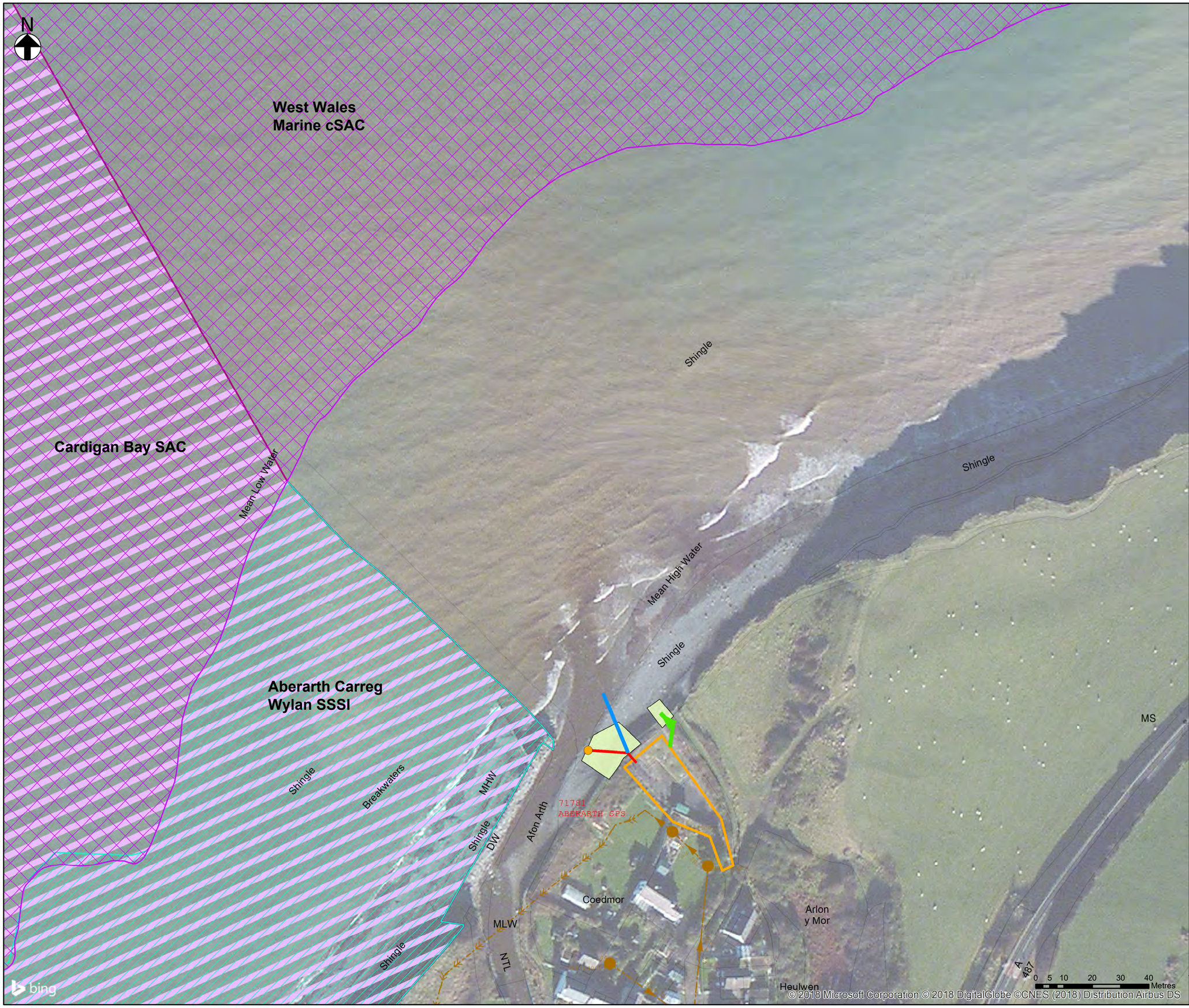
Originator.: CF — Designer.: RC — Date.: 12.02.16

Internal Project Number.: 241187 — Scale.: AS SHOWN — Rev.: C1

Drawing Number.: 4692_S_203-ARP-07-ZZ-DR-CX-06000

J:\241100\241055-0044 Internal Project Data\4-30 Drawings\4692_S_203-ARP-07-ZZ-DR-CX-06000.dwg

A2 Environmental Constraints Plan: Aerial



A3

LEGEND

- Discharge consent
- Proposed outfall
- Existing outfall to be removed
- Access route
- Temporary deposits
- DCWW site compound
- Special Areas of Conservation (SAC)
- Candidate Special Area of Conservation (cSAC)
- Sites of Special Scientific Interest (SSSI)

Grid Reference
(247893, 264105)

Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.
P0	2018-10-15	EA	Preliminary	GM	GM	2018-10-15

Capital Delivery Alliance
Cynghrair Cyflawni Cyfalaf
Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name.
Aberarth Outfall

Drawing Title.
Aberarth Outfall Proposed Works
Environmental Designations

Suitability.	Suitability Code.
Preliminary	2018-10-15

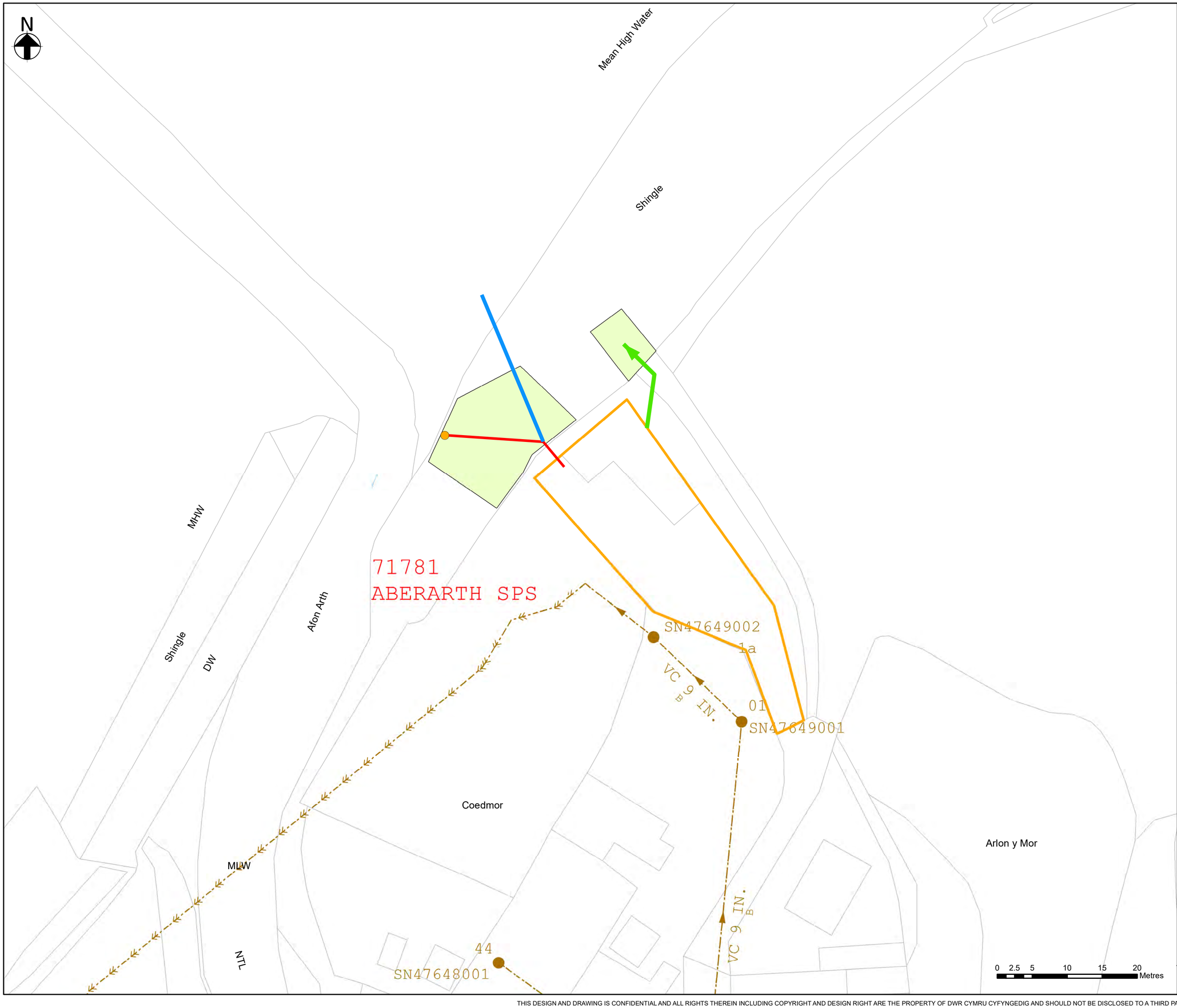
Originator	Designer	Date.
EA	GM	2018-10-15

Internal Project Number	Scale	Rev.
241422	1:1,250	P0

Drawing Number.
002

\\globaleurope\Cardiff_Jobs\241000\241422-004 Internal Project Data\4-80 GIS\4-88 Map Documents\ENV_Environment\Aberarth outfall.mxd

A3 Environmental Constraints Plan: OS Mastermap



A3

LEGEND

- Discharge consent
- Proposed outfall
- Existing outfall to be removed
- Access route
- Temporary deposits
- DCWW site compound

Grid Reference
(247893, 264105)

Rev.	Date.	Drawn.	Description.	Chkd.	Appd.	Date.
P0	2018-10-15	EA	Preliminary	GM	GM	2018-10-15

Capital Delivery Alliance
Cynghrair Cyflawni Cyfalaf
Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name.
Aberarth Outfall

Drawing Title.
Aberarth Outfall
Proposed works

Suitability.	Suitability Code.
Preliminary	2018-10-15

Originator	Designer	Date.
EA	GM	2018-10-15

Internal Project Number	Scale	Rev.
241422	1:500	P0

Drawing Number.
001

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Appendix B

Discharge Consent

CONSENT NO. BP0350101

creu lle gwell
creating a better place

Asiantaeth yr Amgylchedd Cymru
Environment Agency Wales

WATER RESOURCES ACT 1991

SECTION 88 – SCHEDULE 10

(AS AMENDED BY THE ENVIRONMENT ACT 1995)

CONSENT TO DISCHARGE

TO: Environment Quality Scientist
Dŵr Cymru Cyfyngedig
Pentwyn Road
Nelson
Treharris
CF46 6LY

The **ENVIRONMENT AGENCY** ("The Agency") in pursuance of its powers under the Water Resources Act 1991 **HEREBY CONSENTS** to the making of a discharge **OF SEWAGE EFFLUENT**, as follows:

Sewage in an Emergency
Storm Sewage

FROM:	**ABERARTH SEWAGE PUMPING STATION**
AT	**ABERARTH, CEREDIGION**
TO:	**COASTAL WATER (CARDIGAN BAY)**

HEREAFTER SUBJECT TO the conditions set out in the following schedule(s):

SEWAGE IN AN EMERGENCY	**SCHEDULE NO. BP0350101 01**
STORM SEWAGE	**SCHEDULE NO. BP0350101 02**

Subject to the provisions of Paragraphs 7 and 8 of Schedule 10 of the Water Resources Act 1991, no notice shall be served by the Agency, which affects the effect of variations made to this consent, without the agreement in writing of the Consent Holder, during a period of 4 years from the date this variation is issued.

Thiss consent is issued on the 30th day of December 2005 and takes effect on the 31st day of December 2005.

Signed .....

Team Leader – Regulatory Water Quality

Asiantaeth yr Amgylchedd Cymru
"Maes Newydd", Llandarsi, Nedd Port Talbot. SA10 6JQ Ffon 01792 325500 Ffacs 01792 325511

Environment Agency Wales
"Maes Newydd", Llandarcy, Neath Port Talbot. SA10 6JQ Tel 01792 325500 Fax 01792 325511

CONSENT NUMBER	BP0350101
SCHEDULE NUMBER	BP0350101 01
DATE ISSUED	30th December 2005

Sewage in an Emergency (the Discharge)

FROM: ABERARTH SEWAGE PUMPING STATION, ABERARTH, CEREDIGION

NATURE

1. The Discharge shall consist solely of sewage in an emergency.

2. The Discharge shall only occur when the sewage pumping station is inoperative as a result of one or more of the following:

   (i) electrical power failure not due to the act or default of the Consent Holder, its agents, representatives, officers, employees or servants;

   (ii) mechanical breakdown of duty and standby pumps;

   (iii) rising main failure;

   (iv) blockage of the downstream sewer not due to the act or default of the Consent Holder, its agents, representatives, officers, employees or servants;

   and it is not reasonably practicable to dispose of the sewage otherwise. There shall be no undue delay on the part of the Consent Holder in remedying any such failure or breakdown.

LOCATION

3. The Discharge shall be made in the manner and at the place specified as:

   (a) discharging via a 150 millimetre diameter pipe;

   (b) discharging to the Coastal Water (Cardigan Bay);

   (c) at National Grid Reference SN 47888 64085;

   (d) shown marked 'Consent Point' on Plan BP0350101 attached as Annex 1.

CONSENT NUMBER	BP0350101
SCHEDULE NUMBER	BP0350101 01

SAMPLE POINT

4. An appropriately labelled sample point shall be provided and maintained at National Grid Reference Reference SN 47902 64079, as shown marked 'Sampling Point' on Plan BP0350101, or some other point as agreed in writing with the Agency, so that a representative spot sample of the Discharge may be obtained. The Consent Holder shall ensure that all constituents of the Discharge pass through the said sampling point at all times and in any legal proceedings it shall, for the purposes of Section 10 of the Rivers (Prevention of Pollution) Act 1961, be presumed, until the contrary is shown that any sample of the Discharge taken at the said sampling point is a sample of what was discharging into controlled waters.

VOLUME

5. Storage capacity of 24.0 cubic metres or greater, equivalent to a total of at least 2 hours at 3DWF in the sewer immediately upstream of the pumping station, shall be provided in the pumping station, storage tank(s) and/or the upstream sewerage system, above the wet well design top water level.

   For the purposes of this condition 3DWF shall be defined as calculated from 3PG+I+3E where P is population, G is water consumption per head per day, I is infiltration allowance and E is trade effluent flow to sewer.

COMPOSITION

6. (a) The Discharge shall not contain a significant quantity of solid matter having a size greater than 6 millimetres in more than one dimension.

   (b) The Discharge shall not be comminuted or macerated to achieve the standard in (a) above.

RECORDING AND REPORTING

7. (a) The Consent Holder shall establish and operate a documented maintenance programme and record all non-routine actions undertaken that may have adversely affected the operation of the Inlet Pumping Station. Copies of the programme shall be made available for inspection by the Agency's officers at all reasonable times.

CONSENT NUMBER	BP0350101
SCHEDULE NUMBER	BP0350101 01

(b) On request the Consent Holder shall supply the Agency with a written report on the maintenance and all non-routine actions that may have adversely affected the operation of the Pumping Station.

TELEMETRY

8. (a) A 24 hour response telemetry alarm system shall be provided and maintained to provide a notification in the event of operation of the emergency overflow.

(b) The Consent Holder shall notify the Agency, as soon as practicable after receipt of an overflow telemetry warning, that operation of the emergency overflow has taken place.

9. On request the Consent Holder shall supply the Agency with a written report on the operation of the emergency overflow.

POWER

10. Facilities shall be provided so that a mobile stand-by generator may readily be installed at the pumping station in the event of electrical failure and the Consent Holder shall install and operate such a generator as soon as is practicable after an electrical failure.

PUMPS

11. The duty pump shall be maintained in good working order, and at least one stand-by pump shall be provided and maintained.

12. Stand-by pump shall automatically activate should the duty pump become inoperative for reasons other than power failure. The pumping station shall be maintained so that the pump shall automatically reactivate immediately after the power is restored after interruption to the supply.

OTHER

13. A tanker access facility at an appropriate location shall be provided and maintained to enable removal of sewage by tanker when necessary.

SCHEDULE NUMBER	BP0350101 02
DATE ISSUED	30th December 2005

CONDITIONS OF CONSENT TO DISCHARGE

Storm Sewage ("the Discharge")

FROM: ABERARTH SEWAGE PUMPING STATION, ABERARTH, CEREDIGION

NATURE

1. The Discharge shall consist solely of storm sewage.

LOCATION

2. The Discharge shall be made in the manner and at the place specified as:

(a) discharging via a 150 millimetre diameter pipe;

(b) discharging to the Coastal Water (Cardigan Bay);

(c) at National Grid Reference SN 47888 64085;

(d) shown marked 'Consent Point' on Plan BP0350101 attached as Annex 1.

SAMPLE POINT

3. An appropriately labelled sample point shall be provided and maintained at National Grid Reference Reference SN 47902 64079, as shown marked 'Sampling Point' on Plan BP0350101, or some other point as agreed in writing with the Agency, so that a representative spot sample of the Discharge may be obtained. The Consent Holder shall ensure that all constituents of the Discharge pass through the said sampling point at all times and in any legal proceedings it shall, for the purposes of Section 10 of the Rivers (Prevention of Pollution) Act 1961, be presumed, until the contrary is shown that any sample of the Discharge taken at the said sampling point is a sample of what was discharging into controlled waters.

CONSENT NUMBER	BP0350101
SCHEDULE NUMBER	BP0350101 02

VOLUME

4. (a) A storm sewage storage facility of 24 cubic metres design capacity shall be provided and fully utilised prior to discharge being made.

(b) The Discharge shall occur when, and only for as long as, the storm sewage storage facility is fully utilised and the rate of flow at the inlet sewer is in excess of 3.1 litres per second due to rainfall and/or snow melt, and shall consist only of flows in excess of this figure. The storm sewage storage facility shall be emptied and its contents returned to the pass forward flow as soon as practicable after cessation of the overflow.

COMPOSITION

5. (a) The Discharge shall not contain a significant quantity of solid matter having a size greater than 6 millimetres in more than one dimension.

(b) The Discharge shall not be comminuted or macerated to achieve the standard in (a) above.

RECORDING AND REPORTING

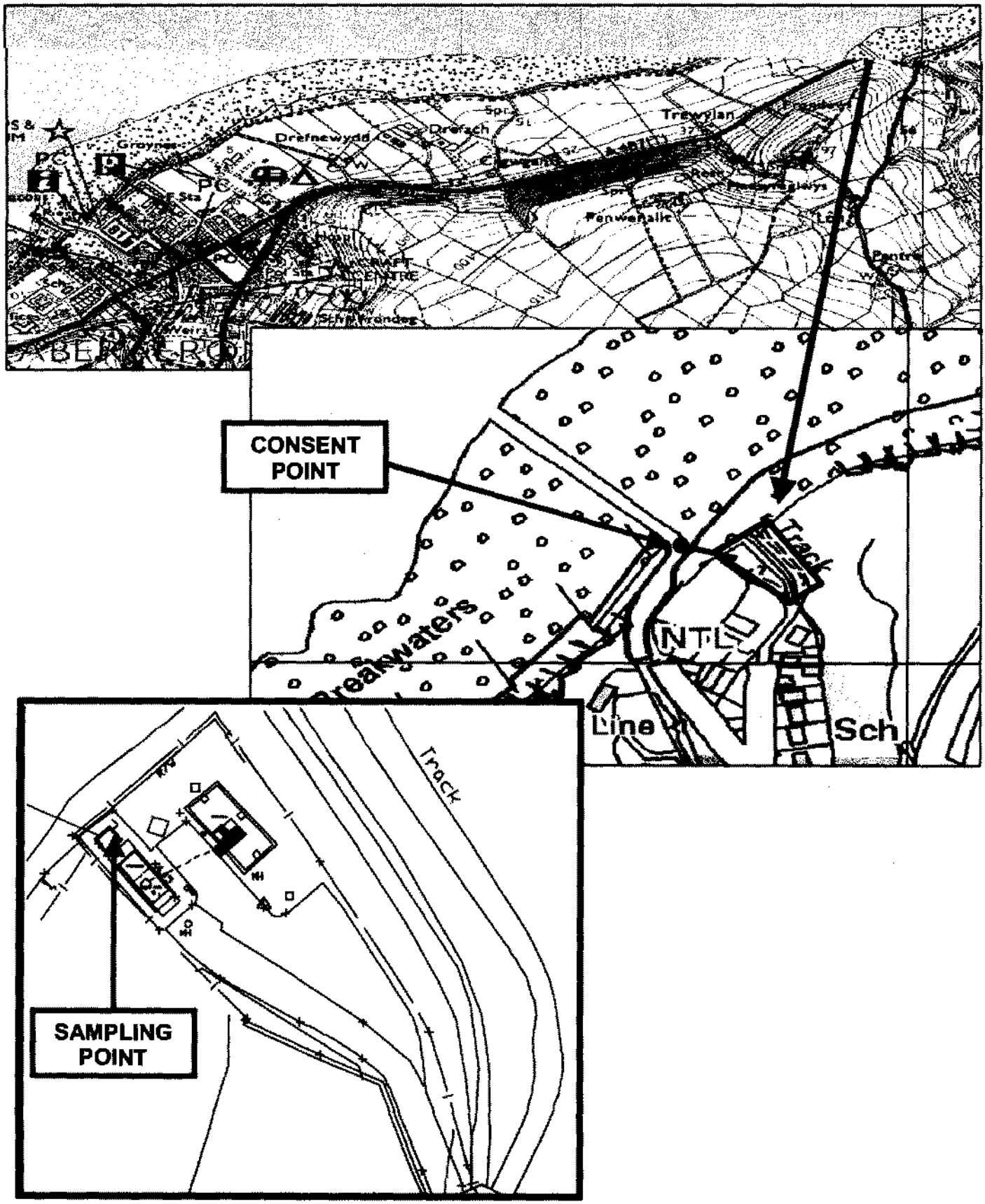
6. The Consent Holder shall notify the Agency in writing if any known or planned introduction or material change in respect of discharges from trade premises to the sewerage system occurs, that may increase or introduce into the effluent any "dangerous substance" (set out in Annex 1 to this notice as updated from time to time and notified to the Consent Holder in writing), and any other substance considered by the Consent Holder as having or likely to have a significant effect on the receiving waters.

MAINTENANCE

7. The overflow shall be maintained in an efficient operational condition.

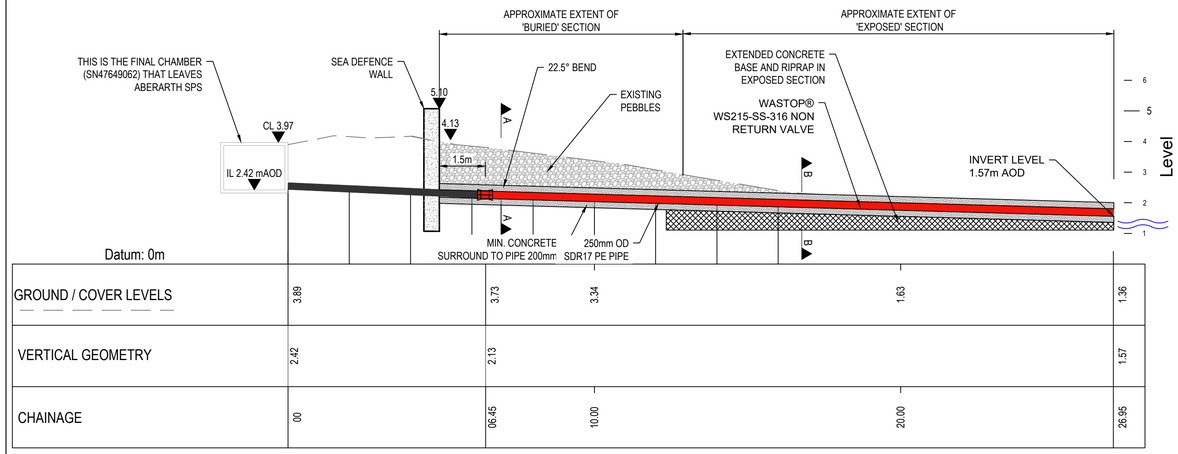
ANNEX 1	BP0350101

ABERARTH SPS,
ABERARTH CEREDIGION



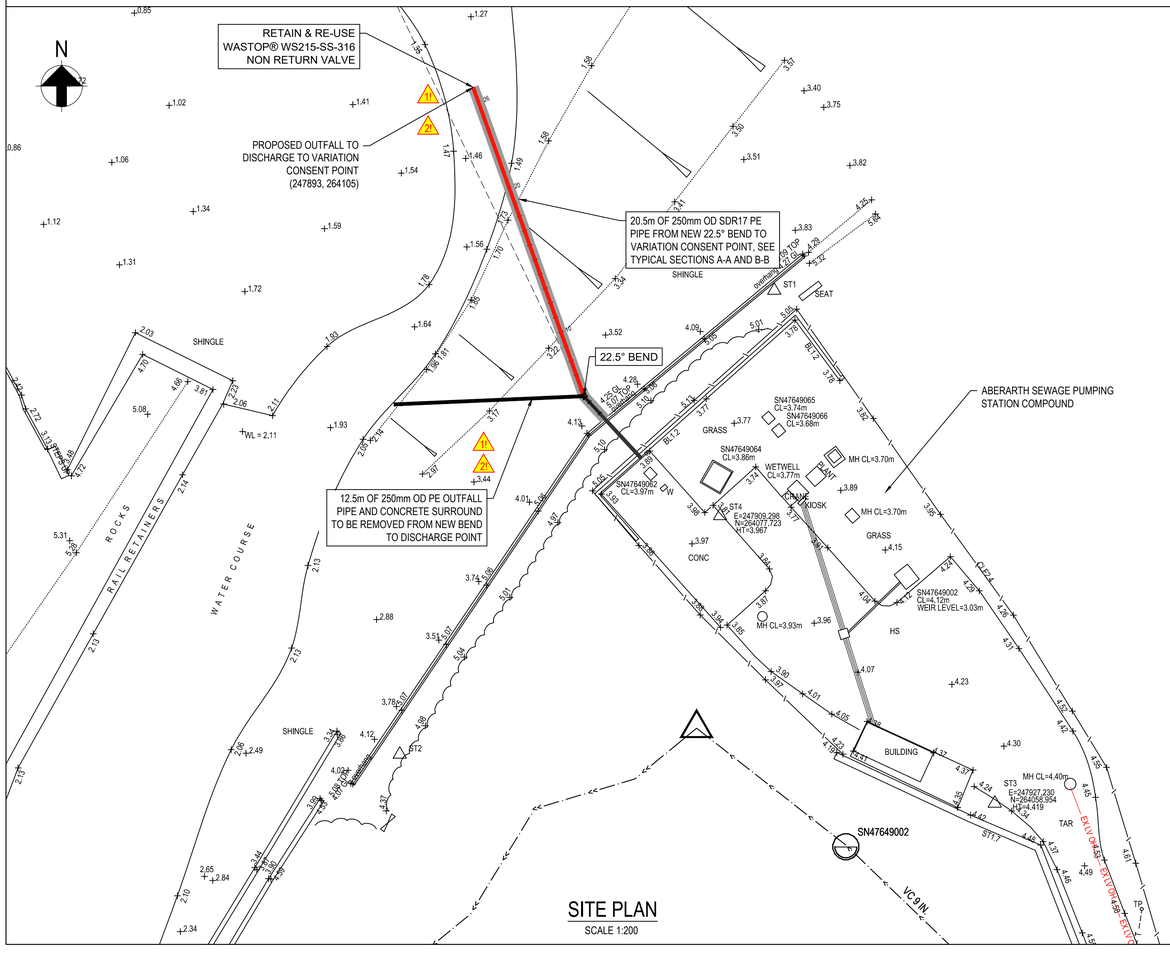
Appendix C

Solutions Document



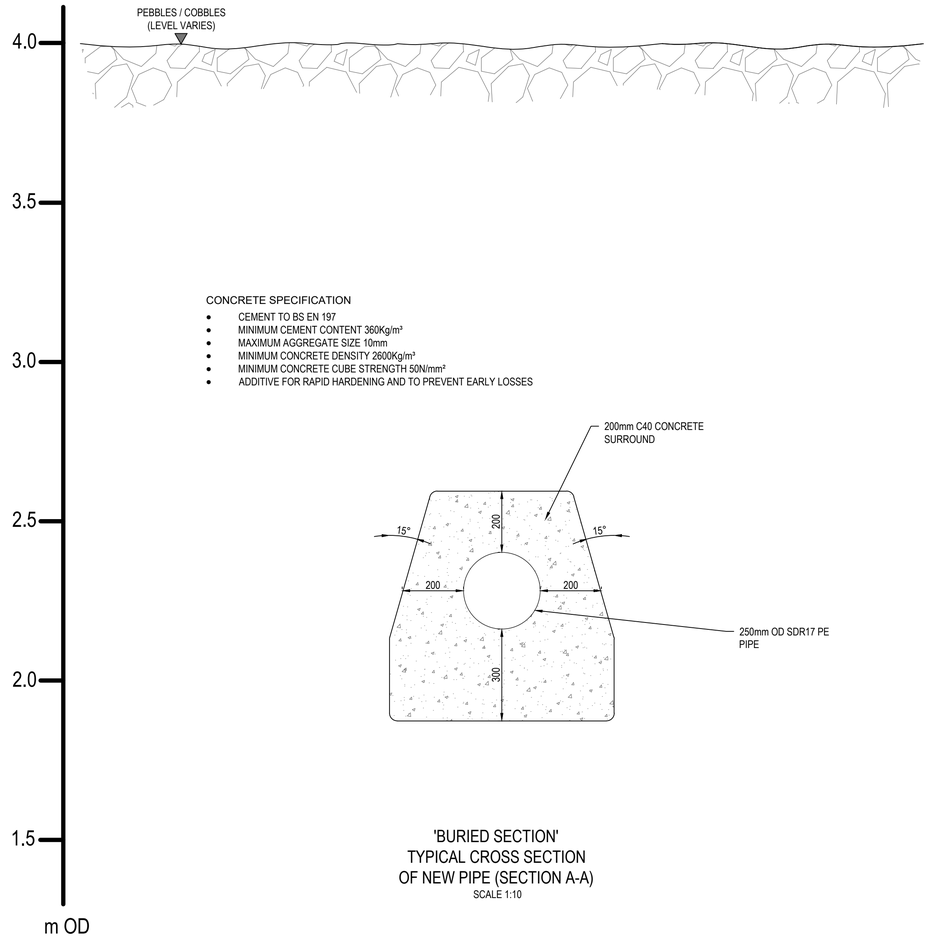
LONGITUDINAL SECTION

SCALE: H 1:100,V 1:100



SITE PLAN

SCALE 1:200

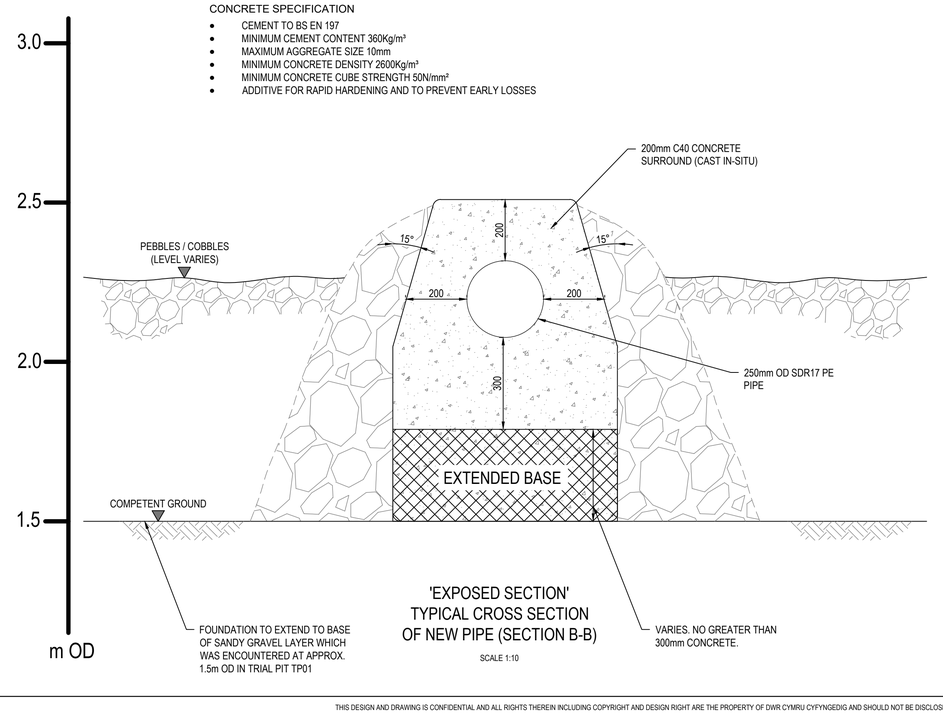


CONCRETE SPECIFICATION

- CEMENT TO BS EN 197
- MINIMUM CEMENT CONTENT 360Kg/m³
- MAXIMUM AGGREGATE SIZE 10mm
- MINIMUM CONCRETE DENSITY 2600Kg/m³
- MINIMUM CONCRETE CUBE STRENGTH 50N/mm²
- ADDITIVE FOR RAPID HARDENING AND TO PREVENT EARLY LOSSES

'BURIED SECTION' TYPICAL CROSS SECTION OF NEW PIPE (SECTION A-A)

SCALE 1:10



CONCRETE SPECIFICATION

- CEMENT TO BS EN 197
- MINIMUM CEMENT CONTENT 360Kg/m³
- MAXIMUM AGGREGATE SIZE 10mm
- MINIMUM CONCRETE DENSITY 2600Kg/m³
- MINIMUM CONCRETE CUBE STRENGTH 50N/mm²
- ADDITIVE FOR RAPID HARDENING AND TO PREVENT EARLY LOSSES

'EXPOSED SECTION' TYPICAL CROSS SECTION OF NEW PIPE (SECTION B-B)

SCALE 1:10

A1

NOTES:

1. REFER TO SEPARATE GEOTECHNICAL REPORTS AND ENVIRONMENTAL REPORTS FOR INFORMATION ON GROUND CONDITIONS & ENVIRONMENTAL CONSTRAINTS.
2. REFER TO 'FOUNDATION ASSESSMENT TECHNICAL NOTE' FOR DETAILS OF TRIAL PIT TP01 AND EXPECTED GROUNDWATER/ TIDAL CONDITIONS.

LEGEND:

- EXISTING SECTION OF PIPE
- NEW PIPE
- SECTION REQUIRING EXTENDED BASE AND RIPRAP

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:

CONSTRUCTION

(1) WORKING NEAR RIVER AND TIDAL WATERS

(2) UNSTABLE / LOOSE ROCK SURFACE

MAINTENANCE / CLEANING / OPERATION

DECOMMISSIONING / DEMOLITION

REFER TO THE DESIGN RISK REGISTER FOR FURTHER DETAILS. IT IS ASSUMED THAT ALL THE WORKS ON THIS DRAWING WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WHO HAS CARRIED OUT A COMPREHENSIVE RISK ASSESSMENT.

Rev.	Date.	Drawn	Description.	Chkd.	Appd.	Date.
P2	18.12.18	LOB	CONSTRUCTION APPROVAL	LOB	ASK	18.12.18
P1	03.10.18	TR	FOR INFORMATION	XX	XX	XXX

Capital Delivery Alliance
Cynghrair Cyflawni Cyfalaf

Ty Awen, Spooner Close, Coed Kernew, Newport, NP10 8FZ

Project Name.	ABERARTH OUTFALL PHASE 2
Drawing Title.	GENERAL ARRANGEMENT AND NEW PIPE PROFILE
Suitability.	CONSTRUCTION APPROVAL
Suitability Code.	S4
Originator.	TR
Designer.	MU
Date.	03.10.18
Internal Project Number.	241422
Scale.	AS SHOWN
Rev.	P2
Drawing Number.	4692_S_209-ARP-07-BG-DR-CC-05001

Appendix D

Risk Assessment and Method Statement (RAMS)

Method Statement

Method Statement Title: Removal of 18mtrs existing sea outfall, and construction of new 20mtrs outfall and head wall.		Scheme Title: Aberarth RA/MS Number:- MS/1W6000 Start Date: 20.11.18		
Prepared by: Eryl Davies	Job title: Site Manager	Company: Morgan Sindall	Signed: Eryl Davies	Date: 20.11.18
Checked by: Kevin James	Job title: Project Manager	Company: Morgan Sindall	Signed: K James	Date: 20.11.18
Approved by:	Job title:	Company:	Signed:	Date:
Issued by:	Job title: Document Controller	Issue: Revision 0	Status For construction	Issue Date:
Review Process: (This method statement accepted as current working document)	Name (Print)	Signed:	Status	1st Review Date:
	Name (Print)	Signed:	Status	2nd Review Date:
Issued to:	Job title:	Please acknowledge receipt of your copy of this MS by signing and returning the transmittal note.		Transmittal date:
Eryl Davies	Site Manager			

Method Statement

Control sheet:

Risk Assessment / Method statement – Tracking Sheet

Name	Job title	Signature	Status	Comments
Kevin James	Project Manager		A	Ok, To proceed
Mike Sellars	SHE Advisor			

Review process

No	Prompt List	Yes	No	In Part	N/A
1.	Unique project specific number and title identified for the document?	X			
2.	Does the method statement / risk assessment include suitable arrangements if sub-sub contractors are involved?	X			
3.	Authorisation and distribution personnel identified?	X			
4.	Brief overview including location and duration of the works described?	X			
5.	Specific Risk Assessment † attached and satisfactory? Are all the hazards/environmental impacts identified? Have all the risks been evaluated and controls identified?	X			
6.	High risk/safety critical / COSHH activities identified / controls specified? (Controls eg – Statutory permits/ licences, Security, Testing / commissioning / special training)	X			
7.	Scope of works identifying / listing all activities? Philosophy identified? Are all parameters identified / listed?	X			
8.	Temporary Works schemes identified? Philosophy identified? Temporary work drawings listed including relevant calculations? Permits required? Interfaces identified?	X			
9.	Names / titles / contact details of key personnel / supervisors responsible?	X			
10.	Resources identified e.g. personnel, supervision, equipment, plant, materials? Craneage – lifting plan in place? Lifting equipment – plan / certificates in place? Access / scaffolding requirements clearly set out?	X			
11.	Induction / training / permit requirements identified? Permit issue authorisation regime identified? Daily briefing and toolbox talk regime identified?	X			
12.	General site requirements identifying access / egress / traffic measures? Details of services / works isolation? PPE / evacuation requirements identified? Welfare / first aid facilities identified?	X			
13.	Monitoring & compliance Monitoring by whom Enforcement – how by whom- equipment (meters / sampling)	X			

Method Statement

14.	Interfaces / security of the client / public / other contractors identified?	X			
15.	Environmental controls / Waste Controller / ECCoP identified?	X			
16.	QC monitoring and inspection / testing regime identified? I&T Plans refs	X			
17.	Contingency plan e.g. emergency / fire / rescue / spill response identified?	X			
18.	Any special conditions identified e.g.				X
19.	Management of Change – process in place to identify change requirements	X			
20.	Review date as required	X			
21.	Approvals statement incorporated?	X			
22.	Confirmation of Operatives briefing / Operatives induction sheet incorporated?	X			
23.	Any other (specify)?	X			

† Any Risk Assessment shall be amended / confirmed as site specific.
* Status
- A Work can proceed as described
- B Work can proceed when comments are incorporated
- C Resubmit and agree before work can proceed

Comments

Note
Clearance to proceed with this Method Statement does not relieve the Subcontractor of their contractual obligations, including safety, structural integrity or any implications to permanent works arising from these proposals.

Method Statement

Scheme Title	**Aberarth Outfall**
Contractor	**Morgan Sindall**

This method statement has been developed further to the completion of the following references risk assessments:

Risk Assessment Number	Title
Included in RAMS	Replacement of 230mtrs existing sea outfall with new 20mtrs outfall and head wall

Section 1 – General Details

Scope of Works:
The purpose of this method statement is to detail the sequence and methodology involved in completing the scheme :- Removal and disposal of existing sea outfall (18mtrs of 225mm pipeline and concrete surround) Construction of new consented out fall and 20mtrs of new 225mm outfall with minimum150mm concrete surround. Construction of New Head wall with Non-return valve (Wastop) and new stone scour protection surrounding the outfall.

Prepared by:	Kevin James		
Position held:	Project Manager		
Signed:		**Date:**	20.11.18
Review date:	tbc		

Work Supervisor(s);	Eryl Davies
Refer to Method Statement Tracking and Content Sheet	

Section 2 – Programme of Operations

Start date / time:	TBC
Preceding Works to be Completed:	None
Duration:	25 days expected on site, subject to favourable weather.
Permit required:	

Method Statement

Permit to Work (General)	☐	**Permit to Enter (Confined Spaces)**	☐	**Permit to Dig**	☒
Hot Work Permit	☐	**Out of Hours Work Permit**	☐	**Other (specify)**	☐
All required Permits will be issued by the Morgan Sindall designated person prior to the works commencing.					

Section 3 – Personnel

The designated site personnel will have experience in the activities that they will be undertaking that are covered by this method statement and risk assessment. The exact names of personnel will be confirmed before works commence, however typical examples are as below.

Name	Role	Competence Details
TBC		
TBC		

Section 4 – Safe System of Work to be Adopted

4.0 Introduction

4.0.1 This method statement (MS) outlines initial proposals for this activity. Where it is identified that there is a need to change the method of work due to unforeseen circumstances for example, then revision, authorisation and issue will follow the same procedure as the original. This method statement is only valid when the person who has prepared it and the person who has authorised it have signed the front sheet accordingly.

4.0.2 Task Statements (TS) will be developed for specific tasks required to carry out the works, as and when required. The MS and TS should be read in conjunction with the site specific plan and the construction programme. The MS and TS are “live” documents and will be updated as required, with newly identified risks.

4.0.3 The Responsible Person must be in possession of an approved method statement and task statement for the works. The Project Manager and Foreman / Supervisor shall ensure that the works proceed according to this approved method statement and subsequently developed task statements.

4.1 Risk Assessment

4.1.1 Template displayed in Appendix A.

4.2 Induction / Training

4.2.1 All site personnel will be familiarised with the site and made aware of any hazards, by way of a site specific induction.

4.2.2 All operatives working on the tasks described in this method statement, risk assessment and any associated task statement must be briefed on its contents. Operatives must sign the attached briefing attendance sheet to confirm that they have been briefed and understood the contents.

4.2.3 Daily briefings shall be given to the operatives prior to work commencing. Tool Box talks will be planned monthly and given to all operatives on a weekly basis. The Morgan Sindall designated person must be in possession of an approved MS and TS before issuing any permits. All operatives must be briefed on the requirements of the permit before work commences.

4.3 General Site Requirements

4.3.1 Access and Egress

· Access and egress to the outfall will be VIA the field to the right hand side of the Dwr Cymru Welsh Water compound, access to the compound will be off the A487 Road running through Aberarth.

A ramped excavation will need to be constructed to access the lower area of the beach, this will be directly outside the compound

From this point the works areas to the beach can be accessed. **When on the beach**, **The working window is expected to be between 2 and 3 hours only at the lowest part.** Tides will be monitored to allow suitable programming of the works, After all works are complete all plant and materials will be removed from the beach area and transported to the DCWW compound

Whilst plant are accessing or traversing the beach area vehicle banks men will be present to control movements to ensure members of the public are not put at risk from the machines.

4.3.2 **Safety of Services**

With reference to the statutory undertakers drawings and trial hole information, all known services will be marked on the ground. A CAT scan will be carried out and a permit to excavate issued prior to carrying out excavations on site. Excavations carried out within 500mm of known services will be carried out by hand.

Not all services encountered will be identified from the service plans and CAT scan – therefore utilise recognised best practice whilst completing excavations.

No lifting operations can take place before a permit to lift has been issued. All lifting operations are to be controlled by a permit to lift produced by a competent appointed person. Machine driver, Slinger Signaller/Crane Supervisor and appointed person all to be CPCS trained and competent.

4.3.3 **Safety Works or Isolation Measures**

Throughout the works, the tide levels will be continuously monitored by a supervisor to ensure the

work force and plant are not cut off by the rising tide. If there is any doubt, all work must cease and all plant and operatives to leave the foreshore.

4.3.4 **Site office, welfare and first aid facilities**

A suitable location will be provided within Aberarth as a temporary site compound where a site office and welfare facilities will be located and where plant and materials shall be stored. No plant or materials will be stored on the foreshore or beach areas, Currently the compound is anticipated to be within the DCWW existing compound.

4.4 Interface Issues

The local community will be fully engaged and advised of the project prior to works starting on site.

4.5 Scheme Construction Methodology

If any of the methodology or construction sequence detail below should change, STOP works immediately, make safe and report to the site supervision.

Site establishment and compound method statement will be compiled when location of proposed compound is known.

Preliminary Instructions

- Main lifting on the project will primarily be undertaken by the onsite excavator. A valid lift plan will be compiled and completed by an authorised CPCS appointed person complete with a schedule of lifts. All slinging of equipment will be undertaken by a CPCS certified slinger/signaller. The excavator driver must also hold a valid CPCS card and be component in the proposed works to be undertaken.
- All lifting chains and equipment will have current test certificates and shall display the current colour coded lifting tag. A copy of the test certificates will be held in the site file.
- A Delivery Lifting Plan & Lorry Loader Checking Form must be completed prior to any delivery offloading on site and the supplier must also have a safe system of work for offloading.
- It may be necessary to temporarily leave broken out concrete or rock on site at the end of a shift if it is not possible to remove fully due to time constraints. All excess and waste materials however will be removed from the beach and disposed of off-site at a suitable licensed facility.

4.5.1 The initial section of works to be complete is to construct the outfall pipe.the 225mm pipeline will be installed to the existing bend in the pipeline, this will be installed using a trench box ground support system (Install method below) or using an open dig method. On laying the pipes to the required gradient on a bed of 150mm concrete and after confirmation the desired line and level has been achieved a 200-300mm layer of concrete will be used to surround the pipeline, The trench will then be backfilled using the as dug material. This sequence will be completed until we reach the existing pipeline 2mtrs from the head wall where the 45deg bend will be installed/Altered or the sequence maybe to lay from the 45deg bend to the proposed outfall location, the desired way of laying will be decided on site and to utilise the tide window.

When all the pipeline is in place the flows can be transferred to the new outfall line and the existing line can be decommissioned, The flow will be transferred during a period of dry weather so as the overflow is not being utilised, the flows will be monitored for this operation.

At or just before low tide, vehicles and personnel shall make their way on to the foreshore from the designated access point and down the beach to the sea outfall location. At all times extreme care must be taken to ensure members of the public are not put at risk or injury.

The vehicles shall be loaded with all plant and materials necessary to undertake the works.

Minimal quantities of fuels, materials etc. will be taken on to the foreshore to reduce the risk of pollution. **Only Tracked vehicles shall be used for this operation, due to the uneven levels of the running surface.**

Once at the sea outfall route the excavator shall clear a number of boulders from the proposed access route to enable the items of plant reach the desired location. These will be moved to one side for replacement on completion of the works, exact replacement of these stones/boulders will not be able to be achieved due to the tide movements and the removal of the outfall which is visible at the lower end of the outfall.

When at the end of the out fall the concrete surround and pipe will be demolished and loaded into the tracked dumper for transport to the site compound for disposal to a licenced waste disposal site. This process will continue towards the shore until the tide is at such a level the works are to be abandoned and all materials and plant are to be moved from the beach area. When demobilising from the beach the location of the end of the existing out fall pipe will be marked to ensure when the following days work is to commence for the removal of the rest of the pipeline.

This process will be repeated until the whole length of the outfall is removed, The resulting void from the outfall removal will be locally filled in with surrounding material and it will then be left to the tide to settle.

Excavations using a Trench Box

The line of the pipeline will be marked out on the ground by utilising the camera team and sonde to locate the pipe. A full CAT scan survey utilising the STAT drawings will be undertaken in the vicinity of the proposed dig.

A permit to dig will then be signed and issued for the specified excavation area. All operatives involved in this operation will be briefed on the known location of any services in the area.

The width of the trench will then be clearly marked by the site team, The extent of the proposed excavation will then be reduced to 1.2mtrs. The Trench box will then be lifted and placed into the excavation by the excavator to the formation of the trench, utilising certified chains.

A valid permit to lift will be produced prior to the lift and signed by the appropriate persons, to confirm that the excavator is within its lifting capacity to handle the temporary works. Also a CPCS certified slinger/signaller will control all lifting operations.

The trench boxes will then be progressively installed using the ‘cut and lower’ technique.

The internal area of the trench boxes will then be excavated with the 360 excavator. When the excavation is under way the corners of the trench box will be pushed uniformly to failure into the

ground. This process will be completed until the desired formation has been achieved. No operative is to be within the trench whilst the excavation is being progressed.

All excavated spoil will be stored to the side of the excavation in a safe and suitable manner, to be used for backfilling operations.

4.7 Contingency Plans

4.7.1 In the event of a spill on site no matter how minor, site personnel must firstly find the source of the spill and **Stop** it, then **Contain** it by using the equipment available in the Spill Response Kit. Then **Notify** the Project Manager, Foreman or Engineer of the details of the incident. A clean-up of the spill will be undertaken.

4.7.2 In the event of a serious injury which as a result the operative cannot be safely moved the Coastguard will be called immediately by calling 999.

4.7.3 Should one of the vehicles break down whilst on the foreshore, a towing chain or strap will be fitted to allow one of the other vehicles to tow it to safety.

4.7.4 First Aid kits are available in the site cabins and vehicles and are also kept by appointed First Aiders.

4.7.5 Damage to any statutory undertakers apparatus should be notified to relevant people using the following contact numbers:-

Statutory Undertaker	Additional Info.	Number
BT	Emergency & Dial before you dig	0800 9173993
WPD	Emergency	0800 052 0400
Wales & West Utilities	Emergency	0800 111 999
DCWW Pollution Helpline	Sewerage	08000 853968
DCWW Control Room	General Enquiries	08000 520130

Section 5 – Plant, Equipment

The following plant and equipment will be used at various times during this operation:-

Plant, equipment and lifting equipment will only be used by operators who are authorised, trained and have CPCS certification. The operator must inspect all plant and equipment before use and if any damage is found, then it shall be removed from service and the Foreman / Supervisor must be informed.

Plant and Equipment

Equipment description	Test Certificates in date (matched to equipment)	Operator details
8t/13t Tracked Excavator	TBC	TBC

Method Statement

Tracked Dumper	TBC	TBC
Tractor and trailer	If required	TBC
Lifting Equipment Tagged and Tested	TBC	TBC
Hand power tools e.g. drills	TBC	TBC
Electric/Petrol Disc Cutter	TBC	TBC
Cable avoidance tool and generator	TBC	TBC
Small tools e.g. hammers, saws	TBC	TBC
Compressor/generator	TBC	TBC

Personal Protective Equipment (PPE)

Equipment description	**Specification** (e.g. type, grade)	**Training required**
Fluorescent jackets or waistcoats	*(to BS EN 471 Class 2) (Class 3 on high speed roads))*	
Safety glasses or goggles	*(to BS EN 166-F for general site work)*	
Safety helmets	*(to BS EN3 97*)	
Steel toecapped boots with steel midsole	*(to BS EN 345)*	
Gloves (appropriate for task)	(to BS EN 388 – Category 2)	

Method Statement

Receipt Acknowledgements

Supervisor in charge of the Work

I confirm that I have read and understand the requirements of this method statement and associated risk assessments and will ensure their communication to operatives under my control and to those who may be affected by its requirements

Signed		**Date**	
Print name		**Supervisor**	

Communication

Communicate the contents of the Method Statement to all those involved or affected by the works and record their details below.

The following personnel have been inducted in the procedures required to carry out the operations detailed in this Method Statement.

Note: please complete the original MS attendance sheet [copy to be kept in the on-site file original to be returned to Document Control]. Copies of the original MS are to be distributed to the MS holders.

Note to Contractor: whenever the method of work changes you must seek agreement from MORGAN SINDALL before proceeding. Remember to instruct all new starters and get them to sign below.

Name	Job Description	Signature	Date	Employer	Inductor

NOTE:

1. If you have any doubt about any information given or contained in this Method Statement – ASK FOR CLARIFICATION.

MORGAN SINDALL

Safety, Health and Environment Risk Assessment

Project title and contract no.	Aberarth Outfall	**Risk assessment no.**	01
Activity	Replacement of existing outfall	**Location**	Aberarth
Person conducting assessment	Kevin James	**Date**	20.11.18
Person supervising work	Eryl Davies	**Date**	20.11.18

Persons exposed							
Employees	x	**Other workers**	x	**Public/ visitors**	x	**Young persons**	
New / expectant mothers				**Disabled**		**Others**	
Estimated total number of persons at risk				3			

	Hazards (what might cause harm?)	**S**	**H**	**E**			**S**	**H**	**E**
1	Adverse Weather Conditions	✓			**17**	Loading/Unloading	✓	✓	
2	Cold	✓	✓		**18**	Materials	✓	✓	
3	Electricity				**19**	Moving Parts of Machinery	✓	✓	
4	Excavation	✓			**20**	Proximity to Water	✓	✓	✓
5	Fire/Flammable Atmosphere				**21**	Scaffold			
6	Floor/Ground Conditions	✓			**22**	Sharp Objects			
7	Flying Particle/Dust	✓	✓	✓	**23**	Stairs/Steps			
8	Hand or Power Tool	✓	✓		**24**	Static Equipment/Machinery			
9	Hazardous Substance	✓	✓	✓	**25**	Structure			
10	Heat/Hot Work				**26**	Temporary Works			
11	Lack of Experience	✓			**27**	Vehicle/Mobile Equipment	✓	✓	✓
12	Lack of Training	✓	✓	✓	**28**	Working Hours/Fatigue	✓	✓	
13	Lack of/too much Oxygen				**29**	Workstation Design			
14	Access	✓	✓		**30**	Work at Height			
15	Lifting Equipment Appliances	✓			**31**	Other			
16	Lighting	✓							

Risk Factor

Risk Quantity	No injury, damage or environment impact	Minor injury, damage or environment impact	Major injury, damage or environment impact	Fatality, building loss, catastrophic environment impact
Almost no probability	A	A	A	U
A small probability	A	A	U	U
A small probability	A	U	U	U
Almost certain	A	U	U	U
	Acceptable		Unacceptable	

Risk Level	**Action**
Insignificant	No action required and no documentary records need to be kept.
Acceptable	No further preventative action. Consideration shall be given to more cost effective solutions or improvements that impose no additional cost burden. Monitoring required to ensure that controls in place are properly maintained.
Unacceptable	Work shall not be started or continued until the risk level has been reduced to an acceptable risk level. While the control measures selected shall be cost-effective, legally there is an absolute duty to reduce the risk, this means that if it is not possible to reduce the risk even with unlimited resources, then the work shall not be started or shall remain prohibited.

Notes:

1. Physical Hazards are the nature of issues that may cause harm. Tick box for hazard.
2. Preventative / Control Measures are the actions that will stop it going wrong.
3. Control measures are to ensure that residual risks are reduced to a minimum. Where controls fail to reduce the risk to an acceptable level then refer assessment to your line manager.
4. If the operations are likely to affect the public or the safe operation of a public infrastructure or transport system, the control measures must reduce the likelihood of significant harm to the level that existed before our work commenced.
5. Where young persons or expectant mothers are involved in the activity, ensure that any additional controls are put in place in accordance with local procedures.
6. In addition to the above, consideration must be given to other individuals' susceptibility due to pre-existing health conditions, e.g. bad back, poor hearing. Additional 'human factors' such as ergonomics, workplace design, etc. should also be considered.

	7. Where a hazard is identified that is not listed in the Physical Hazards list, enter the hazard description followed by other in brackets i.e. (Other).

Hazard no. (from page 1)	Nature of risk (What might go wrong?)	Risk before controls U / A	Control measures (How do you stop it going wrong?)	Control measure implemented by (name)	Risk after controls U / A
14, 16, 20	**Being cut off due to incoming tides** • Damage to plant • Loss of materials • Potential drowning	U	• Works to be undertaken during lowest possible tide levels to provide suitable access and egress. • Work to be undertaken during good weather conditions. • Tide levels to be monitored throughout the work to ensure operatives, plant and materials are safely removed from site before being cut off. • Minimal quantities of labour and kit to be taken to work area. • Work to be carried out during day light hours.	Site Supervisors/ Operatives	A
9	**Environmental Threat:** • Spillage or use of chemicals such as diesel, grease, resin resulting in environmental pollution or harm to personnel	U	• Use of environmentally friendly products where possible. • COSHH assessments for all COSHH items • Dispose of all waste materials to designated skips etc. • Emergency spill kits are to be maintained at every work location and with each main item of plant. • Equipment to be stored on designated drip trays/ bunded areas • Minimal quantities of materials, fuels etc. to be taken on to foreshore.	Site staff, operatives	A
6, 14	**Working on construction sites** • Slips, trips, falls.	U	• Ensure good housekeeping of working areas. • All personnel to have received an specific project and site induction.	Site Supervisors/ Operatives	A

	• Sprains, strains, broken limbs.		• Footwear to have good grips and soles. • Use of crawling boards on rock to prevent slips and falls. • Where possible do not walk across rocks and avoid obvious wet or seaweed covered areas		
7, 8, 12, 19	**Working with construction plant** • Noise and vibration • Ear damage • Environmental impact i.e nuisance noise and damage to properties from vibration • Dust/debris blown into eyes, off cuts of tying wire flying into eyes. • Catching hands on sharp or rough surfaces. • Injuries to eyes, possible blindness. Cuts, lacerations to hands and fingers.	U	• Ensure all plant has noise reduction measures in place and working correctly i.e. baffles, acoustic jackets. • PPM scheme to ensure plant working correctly. • All personnel must wear safety glasses/goggles and gloves at all times once they enter the working area in addition to the mandatory high visibility clothing, hard hat and safety boots. CPCS trained plant operatives. (or similar approved) • Switch off all plant when not in use. • Vibration and noise monitoring during certain operations.	Site Supervisors/ Operatives	A
7, 27	**Interaction with public** • Injury to members of the public due to plant and materials crossing public beach area • Injury to members of the public during works	U	• Minimum quantity of plant and materials to be taken to the work area to reduce number of trips across beach. • Vehicles to be marshalled by operatives walking in front to control speeds. • Where possible avoid busiest locations and abundance of people. • Work area to be controlled to prevent members of the public encroaching by banksman. Stop works if members of the public enter working area.	Site Supervisors/ Operatives	A
12, 15, 17, 19	**Lifting operations** Load falling due to failure of lifting equipment, or	U	• All lifts to be controlled by trained/competent slinger/signaller. • Lift plan to be completed by crane appointed	Appointed person, machine operator, slinger/signaller, Site	A

	incorrectly slung loads Dropping of load in an unsafe manner uncontrolled slewing causing collision with plant or operatives • Serious injury due to crushing, possible death		person and plant certificates to be in place. • No personnel to stand under or near to suspended loads. • Safety zones to be established around lifting operations. • All lifting equipment to be thoroughly examined prior to use • All drivers to be competent experienced and trained to CPCS standard. • Weather conditions to be monitored.	Supervisors.	
14, 17, 30	**Unloading of materials** • Operatives falling off the bed of delivery vehicles whilst assisting with the unloading of materials/plant resulting in serious injury/fatality.	U	• Delivery vehicles to be fitted with integral edge protection barriers. • Under no circumstances are operatives to access the bed of a lorry unless a safe system of work is in place and agreed by the site management. • Hiab off-loading form to be completed and authorised.	Site Supervisors, Operatives.	A
12, 27,	**Use of construction plant.** • Possible crushing of operatives and pedestrians	U	• All mobile plant must only be operated by suitably licensed and trained operators i.e. CPCS cards. • Operatives to wear high visibility clothing • Banksman to be appointed to supervise works • Segregated pedestrian and vehicle access wherever possible.	Plant operator, site personnel, banks man. Site supervisors.	A
9	**Contact with sewage** • Weils disease • Waterborne pollutants and bacteria causing death or serious injury.	U	• PPE to include safety boots/wellingtons, hard hat, glasses, hi-viz, gloves, disposable overalls/oil skins, waders and face mask. • Maintain good personal hygiene practices • Avoid breathing in sewage dust or spray – dust mask/face masks should be worn • Clean contaminated equipment onsite, do not take contaminated equipment home for	All operatives, Supervisors	A

			washing. Where possible isolate flows as much as possible to reduce likelihood of contact.		
8, 27	**Noise from works:** • Noise level too high resulting in noise induced hearing loss. • Disturbance to residents.	U	• Noise to be reduced by engineering means wherever practicable, e.g. use of noise reducing blades, purchasing of silenced equipment, maintenance of equipment to manufacturers specification to avoid worsening noise, e.g. ensure rotating parts are checked for balance and replace if necessary. • Control of Noise at work regulations 2005 to apply • Where noise level is above the 1st action level, currently 80dB(A), hearing protection to be provided on request. • Where noise level is at or above the second action level, currently 85dB(A), appropriate PPE must be worn. • Operatives to be supplied and wear ear defenders to provide protection at 500-2000Hz frequency. Standard Noise Reduction (SNR) - 28-32dB - Approved to EN 352-2.	Site Supervisors, Operatives.	A
7, 8, 12, 19	**Use of Abrasive Wheels:** • Injury to user and other personnel from flying debris or incorrect use of wheel	U	• Use of goggles (to BS2092) • Wear mandatory PPE inclusive of ear defenders • Tool box talks • Ensure all necessary guards are in place • PPM scheme • Competent person only to change the blade ensuring speed match. • Do not use side of blade for any use • Ensure operatives have received abrasive wheel training.	Site Supervisors, Operatives.	A

7, 8, 12, 19	**Contact with flying particles**: • Injury from cutting/grinding operations	U	• Use dust suppression as required • Wear safety spectacles/goggles suitable for the task being carried out • Ensure the manufacturer's recommended/provided guards are present and set correctly on all tools • Ensure a clear area around operation before commencing • Heat resistant clothing • Only trained/competent operatives to use equipment • When using disc cutters always cut away from other operatives and inform anybody in the immediate area that cutting will soon commence	Site Supervisors, Operatives.	A
6, 18	**Material Storage:** • Improper storage/stacking of materials which could overturn/topple resulting in serious injury/fatality to nearby site personnel.	U	• An designated storage area will be fenced off using pedestrian barriers • Good housekeeping must be maintained at all times. • Visual check on lifting points to ensure integrity • Materials to be stacked on firm level ground.	Site Supervisors, Operatives	A
11, 12, 15, 19, 27	**Use of Quick Hitch** • Risk of operatives being struck by a falling excavator bucket or attachment as a result of incorrect attachment or missing locking pins, resulting in death or major injury. • Bucket Failure/Falling whilst digging/grading causing death, major injury • Risk of serious injury to the excavator driver when changing attachments to the quick hitch mechanism. Incorrect attachment change not in accordance with operators manual	U	• CPCS Trained and Certified machine drivers/Operatives. • Operatives are prohibited from working beneath excavators • Machine operators must be trained and deemed competent to operate the type of quick hitch system fitted to their machine. NB: Operators must demonstrate competence by a change of bucket in the presence of Site Supervisors. • Magnor Plant Operators must be inducted by Magnor plant before being employed on a	Site Management, Operatives & Operators	A

	resulting in death, major injury to persons within the operating area of the machine • Failure of Quick Hitch or Attachments due to incorrect fitting. • Failure of Quick Hitch or Attachments due to crowding.		Morgan Sindall Site. • Semi Automatic and Automatic Single locking Quick Hitches are banned on all Morgan Sindall Sites. Quick hitches must be either then Fully Automatic Double Locking or of the Manual type. • Machine operators must sign a declaration at induction to confirm that they have been trained in the use of the machine quick hitch (Quick Hitch Equipment Pre – Start Arrival Check Form) and that they have read and understood the operators manual specific to that quick hitch. • In date certificate of thorough examination or certificate of conformity for all excavators. • Manufactures installation and operation manuals for all types of Quick Hitches must be kept within the excavator and not removed from the cab. • PPM's on all plant to include quick hitch checks. • Visual / physical inspection to be carried out on quick hitch system at the start of each shift or when attachment is changed to ensure the safety pin / latch or clamp connection is in place and secure. NB: Operators must physically get out of the cab to check this – Mandatory Instruction) • Manual quick hitch lever - to be inspected by driver after change of bucket without fail to ensure it is in its locked position. • Buckets and other attachments & "Shake Rattle Roll tests" shall be changed in a safe area away from operatives/third parties.		

			"Shake, Rattle, Roll" test of the fitted attachment, or placing the bucket flat on the ground then trying to un-crowd the bucket so that the bucket tries to disengage from the QH. Test to be carried out when a bucket is changed and at the start of every shift. • Bucket to be removed prior to any lifting operation by the excavator • Any excessive movement of bucket connected via a quick hitch to be reported to site supervisor immediately for investigation of working mechanism of the quick hitch. • Any visual indication of hydraulic leak near to quick hitch mechanism to be reported immediately, stop work immediately and do not commence work until authorised to do so by site supervisor. • Special care to be taken when using quick hitch systems: Manual: This requires the winding of a screw or the use of a bar to open a spring actuated latch. Automatic: This is operated entirely from the cab of the excavator and usually has an independent locking system which functions automatically and does not rely on hydraulic pressure to hold the latch in the closed position. The operator must ensure the locking system has completed before proceeding with work. • Under no circumstances must Piling Hammers be fitted directly to the Quick Hitch, these must be fitted directly to the Excavator Dipper Arm. • Breakers may not be fitted to the Quick Hitch for tasks of a long duration, they must be fitted		

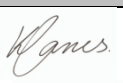
			directly to the Dipper Arm. • Piling Hammers and Quick Hitches must be fitted by a competent service engineer. • Ensure that the correct size of excavator has been chosen to adequately carry out the task.		
4	**Excavation works** • Striking buried services resulting in electrical shock, injury from damaging pressurised pipes etc.	U	• All excavations will be covered by a permit to excavate. • Prior to issue of the permit all service drawings are to be studied and a thorough C.A.T scan performed. • All services known and found to be marked on site. • Excavation to be carried out by hand when 500mm or less from a known service. • Trench dig to be supervised by a competent trained and experienced person • If unknown service is found, stop and report it to the site management team.	Site management team, work supervisor, services coordinator	A
6, 14, 16, 23	**Falls on same level** • Trip over • Fall onto sharp objects • Land on uneven surface • Fall into existing chambers	U	• Good Housekeeping, ensure clean and tidy work spaces • Ensure all materials are stacked as per manufacturers recommendations • Place waste material in the designated areas • Designated walkways to segregate operatives and materials • Signage as necessary	Site Supervisors, Operatives	A
2, 3, 7, 8, 12, 19	**Use of small tools:** • Injury due to faulty equipment • HAV's exposure limits exceeded	U	• All guards are to be in place as per manufacturers recommendations • Tool box talks on safe use of equipment • Plant to be used in accordance with manufacturer's instructions. • Trained personnel for use of plant. • Remove any faulty tools/equipment from service immediately and inform your	Site Supervisors, Operatives	A

			supervisor • PAT testing all portable electrical equipment • Use of correct PPE to suit equipment being used • PPM's for each item to be completed by a competent person • Keep hands warm during colder weather • Limit "trigger" time for equipment being used and rotate workforce • Exercise hands to increase blood flow • Record actual trigger times on daily form		
9, 12, 18	**Contact with/exposure to hazardous substances:** • Injury/Poisoning/Ingestion of COSHH items • Concrete Burns • Weils Disease	U	• Use alternative less harmful substances • Complete COSHH assessment and brief operatives accordingly • Training as required • Wear appropriate PPE • Only authorised personnel to use substances • Tool box talks (COSHH) • Disposal to designated COSHH skips and further disposal to licensed tip ensuring a waste transfer note has been completed. • Do not use materials until fully aware of the associated risks • Wash off any concrete/mortar splashes as soon as possible • Report any burns to your supervisor – do not ignore burning "sensations" check them out. • Good Hygiene – wash any area that came into contact with substances thoroughly	Site Supervisors, Operatives	A
6, 12, 17, 18, 28	**Manual Handling:** • Operatives suffering muscoskeletal injuries • Damaging items being lifted	U	• Provide regular manual handling training/toolbox talks • Assess load to be lifted using TILE and use mechanical means of lifting if possible • Complete manual handling risk assessment if	Site Supervisors, Operatives	A

			mechanical lift is not possible • Break down load to a more manageable size • More than one person to complete lift if load is awkward or irregular in shape		

Method Statement required?	Yes	✓	No		**Method Statement number:**	MS/ 1W6000

Additional Risk Assessment (Tick box as required)						**PPE (Tick box as required)**							
Noise		COSHH		Handling		Helmet		Respiratory		Boots		High Vis	
Asbestos		Lead		Radiation		Hearing		Eye		Harness		Others	

	Name	**Signature**	**Date**
Person completing the assessment:	Eryl Davies	pp. 	20.11.18
Person reviewing the assessment:	Kevin James		20.11.18
Date to be reviewed:	TBC		

Appendix E

Habitat Plans

E1 NRW Intertidal Biotope Plan (1990)

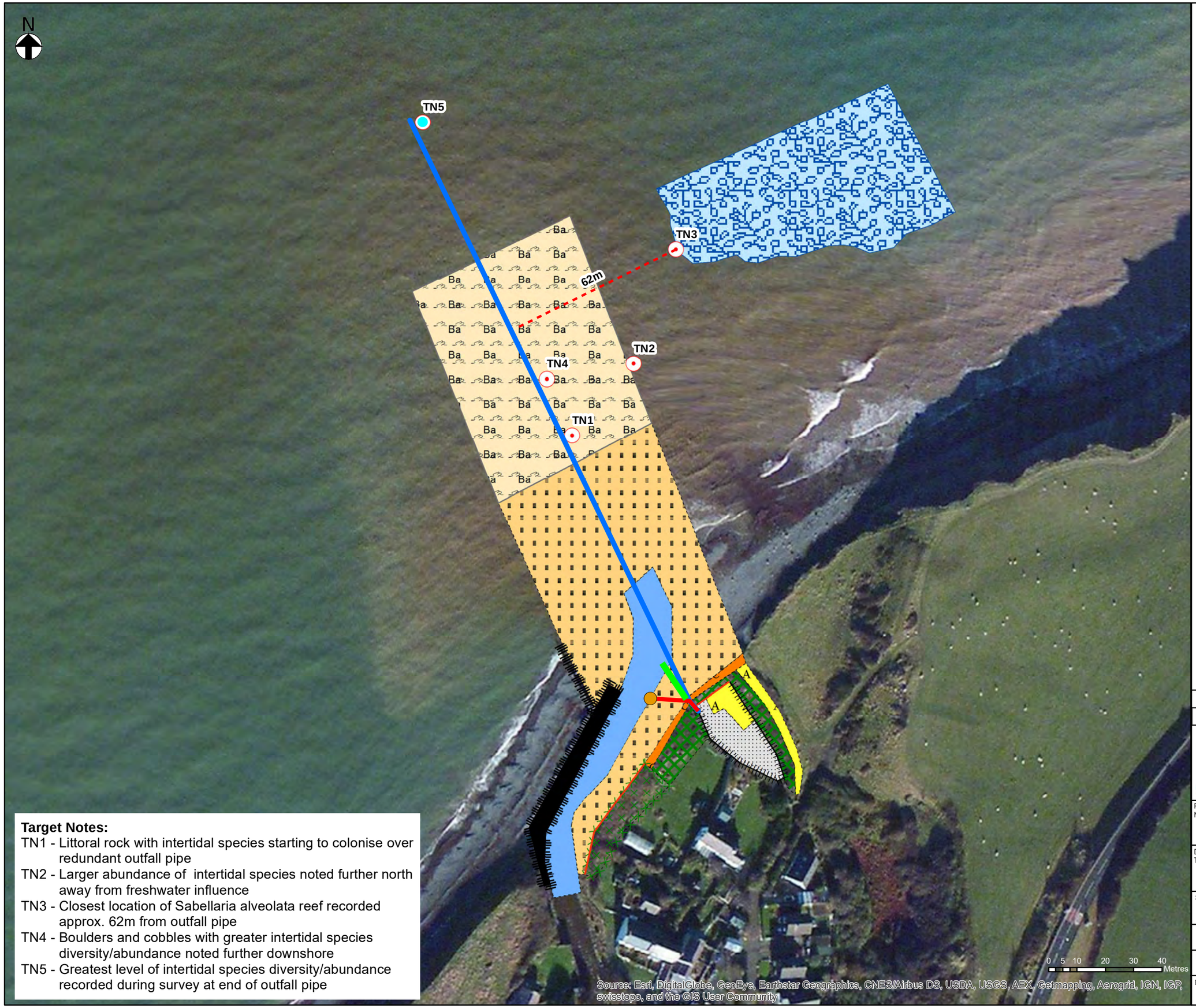
Aberarth marine biotopes

Produced by NRW on: 18 December 2015

Scale 1:6280

Cyfoeth Naturiol Cymru
Natural Resources Wales

E2 JNCC Phase 1 Habitat Survey Plan



Target Notes:

TN1 - Littoral rock with intertidal species starting to colonise over redundant outfall pipe

TN2 - Larger abundance of intertidal species noted further north away from freshwater influence

TN3 - Closest location of Sabellaria alveolata reef recorded approx. 62m from outfall pipe

TN4 - Boulders and cobbles with greater intertidal species diversity/abundance noted further downshore

TN5 - Greatest level of intertidal species diversity/abundance recorded during survey at end of outfall pipe

LEGEND

A3

- Discharge Consent
- New Outfall
- Outfall to be Removed
- Distance of Sabellaria to Pipe
- Target Note
- Scattered scrub boundary
- Fence
- Wall
- Sea wall
- Dense scrub
- Scattered scrub
- Running water
- Intertidal shingle/cobbles
- Brown algal bed over intertidal boulders/rocks
- C — Coastal grassland
- A — Amenity grassland
- Buildings
- Sewage Pumping Station
- Sabellaria

Rev.	Date.	Drawn.	Description.	Chkd.	Appd.	Date.
P1	2016-01-07	FG	Preliminary	TS	PC	2016-01-29

Capital Delivery Alliance
Cynghrair Cyflawni Cyfalaf
Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name.
Aberarth Outfall

Drawing Title.
JNCC Phase 1 Habitat Mapping

Suitability.	Suitability Code.
Preliminary	2016-01-07

Originator	Designer	Date.
FG	TS	2016-01-07

Internal Project Number	Scale	Rev.
241055-00	1:1,250	P1

Drawing Number.
Figure 2

\\global\europe\Cardiff\Jobs\241000\241055-00\4 Internal Project Data\4-80 GIS\4-84 Map Documents\ENV_ EnvironmentAberarth_ Ecology.mxd

Appendix F

Pipeline Photographs

F1 New Outfall Alignment

F2 Obsolete Outfall Alignment

Appendix G

Otter and Lamprey Survey Report

THE OTTER CONSULTANCY

TRUNK ROAD A487
ABERARTH IMPROVEMENT PHASE 2

OTTER & LAMPREY SURVEY REPORT
August 3 2012

A report for: Phillip Bryan
Director
HollandBryan Associates

CONTENTS

Geoff Liles, Llwyneinon Isaf, Capel Iwan, Newcastle Emlyn, Carmarthenshire, SA38 9LY

INTRODUCTION

Phase 2 of the A487 Aberarth Improvement is the construction of a footbridge across the Afon Arth on the upriver side of the road bridge.

The span of the footbridge stretches from the high retaining wall on the south bank of the river across to the 3m high bank adjacent to Glasfryn house on the north bank.

As part of the ecological impact assessments for this scheme, surveys are required to identify issues relating to otters (*Lutra lutra*), the River Lamprey (*Lampetra fluviatilis*) and Sea Lamprey (*Petromyzon marinus*) that are thought to occur in the Afon Arth.

This report describes the results of surveys for otters and lampreys, together with an assessment of the likely impact of the scheme on these species, and recommendations for mitigation (where necessary) to reduce impacts.

SURVEY METHODS

The survey was carried out on August 2nd 2012 after a period of settled weather with little rain. River levels were slightly higher than normal for this time of year, but most of the river bed was visible, and all river banks were in clear view.

Information collected during the survey was marked on a large scale map of the site and described in notes. The grid ref of key sites was recorded using a hand held GPS, and photographs were taken using a digital camera.

The survey was carried out in thigh waders so that all parts of the river could be investigated.

OTTERS

The aims of the survey were to:

- Locate and describe evidence of otter activity, including spraints, resting, breeding, feeding sites, and travel routes;
- Assess the likely impact of the proposed development on otters & habitats;
- Recommend mitigation measures where appropriate.

During the survey a search was made for:

- signs of otters – spraints (droppings), footprints, rolling places, pathways through vegetation, couches, food remains (fish scales and carcasses);
- resting sites - actual, possible or potential sites where otters are or can lie up during the day;
- breeding sites – in particular, for paths through vegetation from the stream to suitable cover that could lead to a natal den;
- feeding areas – in particular, sites with abundant amphibians.

Sites are identified as being resting sites if they are typical of the places known to be used by otters for lying up, and show evidence of use. Two categories are used to describe resting sites, depending on the strength of evidence available.

A third category is used (Potential Resting site), to record the existence of cover or sites which could be used as resting sites by otters.

Actual Resting Site – signs that the site is well used by otters are present, including a well trampled entrance, otter spraints or footprints.

Possible Resting site - the site is typical of an otter resting site, with obvious evidence that it is being used by a mammal, but no signs are present that otters use the site.

Potential Resting site - the site is typical of an otter resting site, but there are no signs of use (e.g. an entrance), by any mammal.

LAMPREYS

The aims of the survey were to:

- Locate possible larval nursery beds and spawning habitat;
- Assess likely impacts of the scheme on lampreys;
- Recommend mitigation measures to reduce the impact of works on lampreys.

During the survey the river bed was searched for:

- areas of sand / silt or mud / silt that could provide the larvae (ammocoetes) of both River & Sea Lamprey with nursery beds.
- Areas of stony or gravelly substrate that could be used by lampreys for spawning.

RESULTS: OTTERS *Please refer to maps (Figs 1 & 2) for location of sites.*

SITE DESCRIPTION

1. Bedrock (Plates 1 & 2) forming waterfall – no otter signs.
2. Group of 6 boulders at base of bridge (Plates 3 & 4). Cavities within the boulder pile are too open and exposed to be used as a resting site. In addition, the owner of Glasfryn regularly collects flood timber trapped by the boulders so that the site is disturbed.
3. River bank under the proposed location for the footbridge is almost vertical, 3 – 4m high and made of cobbles (Plate 5). Garden shrubs grow on top of the wall and overhang the bank with ivy clinging to the wall. Also an ash and hawthorn tree beneath proposed footbridge. Ash is >1.5m above bed level, but there are no cavities under the roots (Plate 6 & 7).
4. Otter spraint – 1 fresh, 1 recent – on stones on earth bank under road bridge.
5. Very high retaining wall along river. No gaps or cavities.
6. Large multi – stem sycamore 1.5m above river bed. Cavity in the base of the trunk on the upriver side (Plate 8) is next to a well used path down the bank from the Glasfryn garden to the river, so very disturbed.
7. Bank height is >1m along Glasfryn garden. Shrubs with occasional alder but no otter cover (Plate 9).
8. Bank height c2m with shrubs and trees. Some potential cavities at the top of the bank that might provide otter resting sites, but bank is loose earth and is not possible to climb to investigate further.
9. Woodland along the right bank (looking downriver) with garden on left bank (Plate 10).
10. Upriver from garden river flows through woodland on both banks.
11. River flows over bedrock down to the existing footbridge (Plate 11).
12. Stone wall along garden with willows. Small ash has no cavities (Plate 12).
13. Potential Resting Site – cavity under a felled sycamore stump with a curtain of bramble (Plates 13 & 14). Site is below the decking in the garden.
14. Below the existing footbridge the river is tree lined on the right bank (Plate 15) and mainly walled on the left, but with no resting sites.

Fig1 ***MAP SHOWING TARGET SITES (near bridge)***

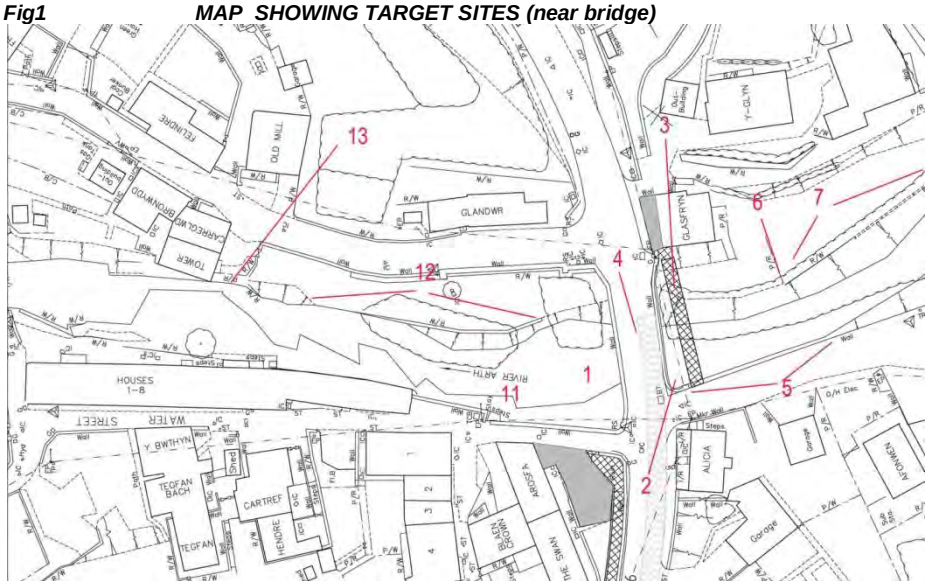


Fig2 MAP SHOWING TARGET SITES (Up & down river from bridge)

RESULTS: LAMPREYS *Numbered sites below refer to target sites in Figs 1 & 2.*

SITE DESCRIPTION

1. Bedrock below the road forms a small waterfall. This may be a barrier to lamprey migration.
3. River bed beneath the location of the proposed footbridge is either bedrock or large cobbles with no silt or gravel beds.
11. Downriver from the road bridge to the existing footbridge the river flows over bedrock with no gravel or silt areas.
15. Below the existing footbridge and down to the mouth of the Afon Arth, the river bed is dominated by cobbles and larger boulders, an example of which is shown in Plate 16.

DISCUSSION & CONCLUSIONS

OTTERS

1. Although otters travel along this stretch of river, there are no resting sites in the immediate vicinity of the road bridge and proposed footbridge.
2. The nearest potential resting site is approximately 100m downstream from the road bridge at Target Site 13.
3. Cavities within the group of boulders at Target Site 2 (considered to be a potential resting site during an earlier survey in 2007), are too exposed and disturbed to be useful to otters, but could be improved.

LAMPREYS.

1. Lampreys have never been recorded on the A. Arth during routine electro-fishing surveys (L. Thornton, Environment Agency Wales, pers comm.).
2. Adult lamprey usually migrate some distance up river systems in order to find suitable spawning gravels. The bedrock water fall below the road bridge is not high, but may act as a barrier to lamprey.
3. Larval lampreys (ammocoetes) are washed downriver to areas of sand, silt & mud usually in relatively still waters, or backwaters off the main river channel. The lower reach of the A. Arth has only small patches of silt, even at the river edges, and the bed is generally dominated by stones/cobbles from edge to edge.

POTENTIAL IMPACT OF THE PROPOSED DEVELOPMENT

CONSTRUCTION PHASE

OTTERS

1. The removal of trees and works to the bank on the Glasfryn side of the river will have no impact on otters as there are no resting sites within this section of bank.
2. The Potential Resting Site is far enough away from the noise and activity of construction work and should not be disturbed during the work.
3. If pile driving is to be used during construction works, there could be disturbance to the Potential Resting site at Target Site 13.
4. Noise and activity associated with construction work itself will have no impact on otters *so long as it is carried during daylight hours*.

LAMPREYS

1. Works to the river bank for footbridge construction will have no impact on lampreys.

LONG TERM

OTTERS

1. The existing overhanging tree cover on the Glasfryn bank acts as a screen, blocking out light and human activity from the river. The removal of this cover may lead to increased disturbance at this point if light from the house is able to spill onto the river channel.
2. The footbridge itself will have no long term impact on otters. However, disturbance to the river could occur if bank clearance and re-profiling for the footbridge provides easy access to the river for people and dogs.

LAMPREYS

1. The footbridge will have no long term impact on lampreys.

MITIGATION RECOMMENDATIONS

OTTERS

1. Construction works should be carried out during daylight hours.
2. Any night time security lighting should be directed away from the river channel to avoid disturbance to travelling otters.
3. During construction works to the river bank on the Glasfryn side, it will be important to ensure that an easy access for otters from the river to the road is not created (by, for example, a slope up the bank).

OTTERS Continued

4. If pile driving is to be used during construction, the Potential resting site at Target Site 13 should be surveyed for otter use immediately before work starts. If the resting site is in use by otters, pile driving should be delayed until the resting site is vacated (normally within 1 to 3 days).

LAMPREYS

1. No specific mitigation measures are required. It is assumed that the normal measures to prevent pollution and debris entering the river will be undertaken.

PLATES

Plate 1 Site 1 – Bedrock

Plate 2 Site 1 – Bedrock waterfall

Plate 3 Site 2 – Boulders by bridge

Plate 4 Site 2– Boulders by bridge

Plate 5 Site 3 – Bank under proposed FB

Plate 6 Site 3 – Ash tree

Plate 7 Site 3 – Ash tree no cavity.

Plate 8 Site 6 – Sycamore with cavity

Plate 9. Site 7 – Bank under garden

Plate 10 Site 9– Woodland

Plate 11 Site 11 – River downriver from road bridge

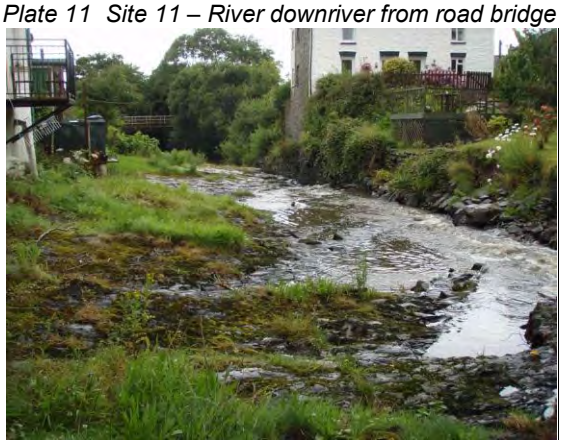


Plate 12 Site 12 – Small ash no cavity

Plate 13 Site 13 – Potential Resting Site

Plate 14 Site 13 – Potential Resting Site cavity

Plate 15 Site 14– River downstream from FB

Plate 16 Site 15 – Example of cobble river bed.

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