

Skewen Flood Alleviation Scheme

Habitat Regulations Assessment

Neath Port Talbot Council

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Abbreviations

FCS	Favourable Conservation Status
HRA	Habitats Regulations Assessment
JNCC	Joint Nature Conservation Committee
LSE	Likely Significant Effect
MAGIC	Multi-Agency Geographical Information for the Countryside
MCA	Maritime Coastguard Agency
MHWS	Mean High Water Springs
NPTC	North Port Talbot Council
NRW	Natural Resource Wales
SAC	Special Area of Conservation
TLSE	Test of Likely Significant Effect

1. Introduction

Atkins was commissioned by Neath Port Talbot Council (NPTC) to develop proposals for a flood alleviation scheme for Caenant Terrace in Skewen, Wales, known as the Skewen Flood Alleviation Scheme (herein referred to as 'the Scheme'). The Scheme will comprise of several phases, with the aim to reduce risks associated with surface water and watercourse flooding in Skewen; this report will focus solely on the proposed works for the construction of a new overflow structure (adjacent to the existing weir) on the Tennant Canal.

The Scheme is linear and covers approximately 1.3km, beginning at Caenant Terrace to the west, centred on grid reference SS7268097520 and culminates at the confluence of the Tennant Canal and River Clydach to the east of Neath Abbey (grid reference SS7386597293) (hereafter referred to as the Site). The Site includes additional areas of land proposed for drainage connections, to the centre of the Site along Drummau Road and to the south-east along the Tennant Canal. The Site boundary is shown in Figure 1-1 and Appendix A. The Site consists of a heavily populated residential area, with the A4320 (New Road) to the north, which is flanked by shops and the B4290 (Old Road) between the residential area and the industrial estate to the south leading to the Tennant canal.

The Scheme will comprise of five key linked elements (refer to Section 1.1) to reduce the risk of flooding to Skewen. An illustrative plan of the Scheme showing the key elements is provided in Figure 1-1 and Appendix A. A Marine Licence is only required for one element of the Scheme. A more detailed description of the Site and its location can be found in Section 1.1.

As construction of the Scheme will take place in close proximity to European¹ designated conservation sites, an assessment of potential impacts on the designated conservation sites is required to support a Marine Licence Application.

This document has been prepared in accordance with the Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations'). The Habitats Regulations require that a plan or project not directly connected with or necessary to the management of the conservation sites but likely to have a significant effect, either individually or in combination with other plans or projects, shall be subject to an assessment of its implications for the site in view of the site's conservation objectives.

This report represents the findings of Stage 1 (Screening) of the Habitats Regulations Assessment (HRA) process and aims to identify the potential impacts and any likely significant effects of the Scheme against the qualifying features of the designated conservation sites and address these impacts.

¹ Following the changes made to the Conservation of Habitats and Species Regulations 2017 (as amended) by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, SACs and SPAs in the UK no longer form part of the EU's Natura 2000 ecological network and now form part of a UK national site network. In this document they are still referred to as European Sites.

1.1. Proposed Scheme

The works required for the Marine Licence application will involve construction of a new overflow structure (adjacent to the existing weir) on the Tennant Canal. The purpose of which is to discharge water from the canal and into the River Clydach in a flood event. The works are shown in Figure 1-2 and Appendix A. The individual aspects of the works for the overflow structure are detailed below:

- Construct a reinforced concrete overflow structure, 5.7m long x 1.5m wide adjacent to the existing weir structure. This will be underneath the tow path of the Tennant Canal and allow flood flows to discharge to the River Clydach. The reinforced concrete structure will be constructed in-situ with materials transported along the canal tow path. The steel reinforcement and timber formwork will be constructed by hand on site. The concrete will then be pumped from the canal tow path into the sealed formwork to create the overflow structure.
- Construct a reinforced concrete stepped cascade from the overflow structure to the banks of the River Clydach. The same techniques noted above will be used.
- Construct a blockstone training wall to support the existing ground downstream of the overflow structure. This blockstone will be placed using an excavator.
- Install turf reinforcement and rockroll on the river banks and in the river channel to reduce erosion due to flood flows. The materials will be lifted with an excavator and fixed in place by hand.
- The works are also likely to require rock rip rap at the base of the river channel to reduce bank erosion. The materials will be lifted and placed with an excavator at low water.
- The works will take place on the banks of the River Clydach and on the canal tow path. It is not envisaged that any plant, equipment or vessels will be sat in the River Clydach. However, for the erosion protection works at the base of the structure and river these will need to be placed by an excavator (from the land) and work at low water.
- Access to the location of the works will be along the canal tow path.
- No scaffolding will be used in the River Clydach watercourse for these works.
- An excavator will be required to excavate the existing ground for the new overflow structure. A dumper will be used to take the material off site for disposal to an appropriate site.
- Concrete repairs and repointing of the existing weir structure are likely to be required to maintain the overall integrity and to block up the existing weir when the new structure is operational.
- Due to limited space for access the work sequence is likely to start on the banks of the river first and then work towards the structure on the canal.

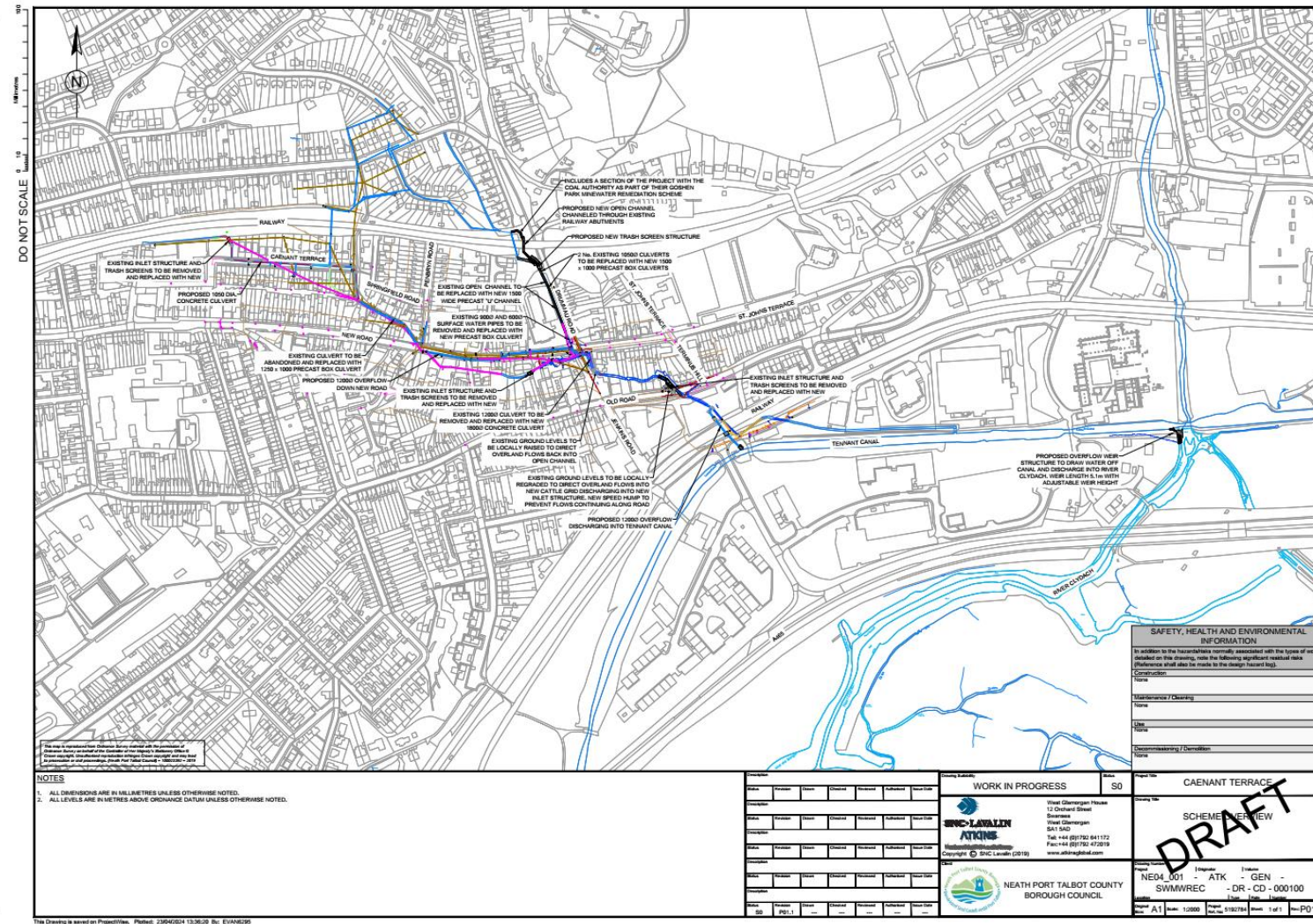


Figure 1-1 – Site Layout Plan

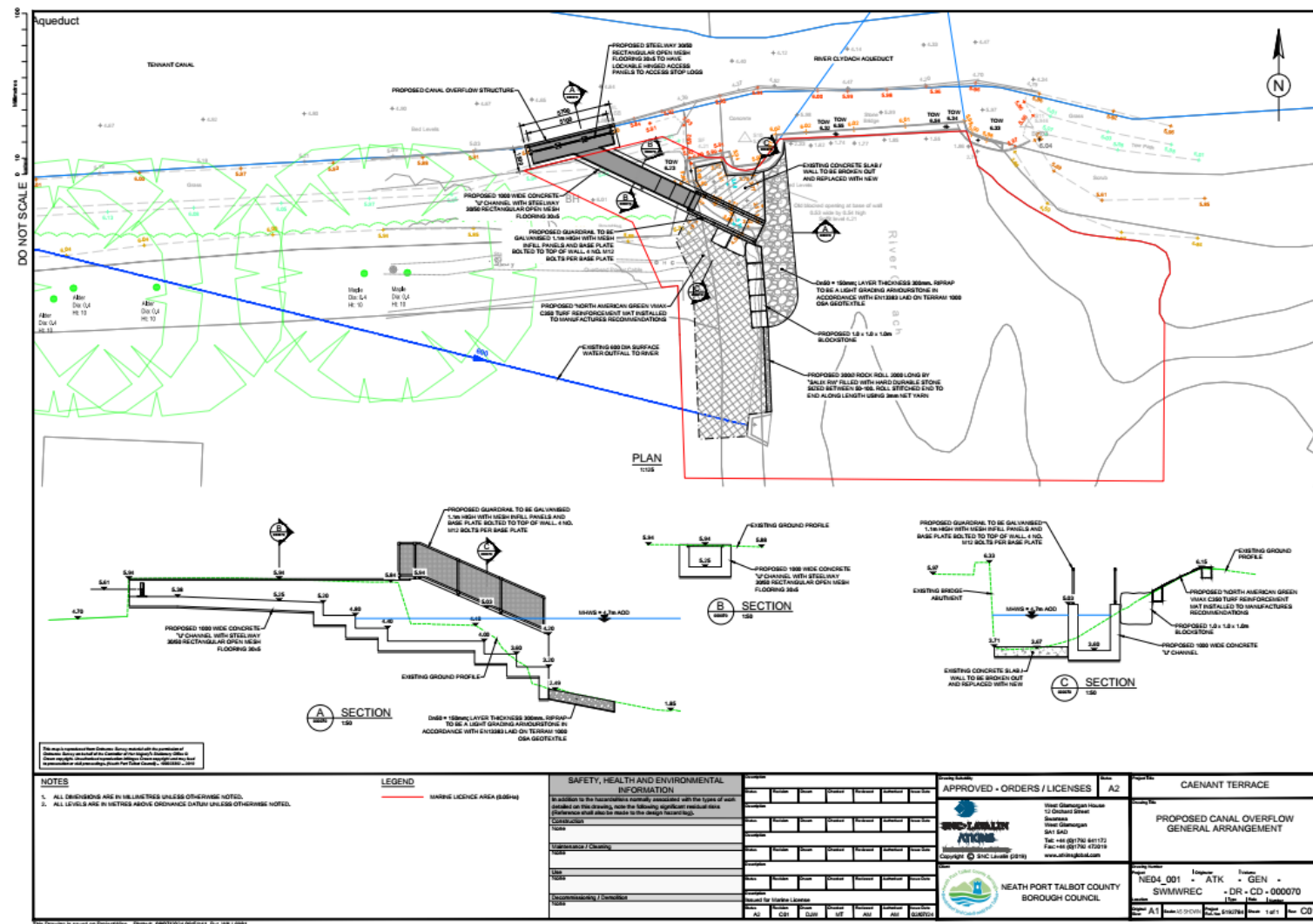


Figure 1-2 – Scheme Arrangement

2. Proposed Works and Programme

2.1. Proposed Access and Construction Method

2.1.1. Proposals covered by the Marine Licence application.

The proposals are shown in Figure 1-2 above.

2.1.2. Proposed works and methodology

The anticipated methodology for this section of the works are detailed below:

Works required: The works will involve construction of a new overflow weir structure (adjacent to the existing weir) on the Tennant Canal. This will discharge flood flows to the River Clydach.

Reason needed: The structure is needed to discharge flood water from the Tennant canal and into the River Clydach in a flood event.

Plant required: Wheeled dumper, wheeled JCB, tracked excavator, excavator with a grab to place blockstone, excavator with sheet piling attachment, small tools such as drills and disc cutters. Concrete pumps and skips. Pumps and settlement tanks.

Method for works: The individual aspects of the works for the overflow structure are detailed below:

1. Construct a reinforced concrete overflow structure, 5.7m long x 1.5m wide adjacent to the existing weir structure (Clydach Aquaduct on Tennant, reference 82339). This will be buried in the tow path of the Tennant Canal and allow flood flows to discharge to the River Clydach. The reinforced concrete structure will be constructed insitu with materials transported along the canal tow path. The steel reinforcement and timber formwork will be constructed by hand. The concrete will be then be pumped and placed within the sealed formwork from the canal tow path.
2. The insitu reinforced concrete weir will be fabricated from reinforced steel. This will be constructed by hand in the excavation. Steel bars will be carried by hand and fixed by hand. Once the steelwork is fixed together timber formwork will be constructed around the steelwork. This should be constructed by hand but there will be a need to lift some of the heavy materials and formwork into the excavation by an excavator.
3. Once temporary timber formwork is in place this will be infilled with concrete. The concrete will be delivered to site via a concrete wagon. The concrete will then be transported in smaller loads along the canal towpath or pumped from the wagon into the timber formwork. This reduces the risk of a machinery working near the existing weir.
4. A reinforced concrete stepped cascade will also be constructed from the overflow structure to the banks of the River Clydach. The same techniques noted above will be used.
5. A blockstone training wall will be constructed to support the existing ground downstream of the overflow structure. This blockstone will be placed using an excavator with a grab.
6. North American Green turf reinforcement and rock rolls will be installed on the river banks and in the river channel to reduce erosion due to flood flows. The materials will be lifted with an excavator and fixed by hand.
7. The works are also likely to require rock rip rap at the base of the river channel to reduce bank erosion. The materials will be lifted by an excavator from the land and placed at low water.
8. The works will take place on the banks of the River Clydach and on the canal tow path. It is not envisaged that any plant, equipment or vessels will be sat within the River Clydach. However, for the erosion protection works at the base of the structure and river these will need to be placed by an excavator (from the land).

9. Access to the location of the works will be along the canal tow path and potentially through the grounds of the Neath Abbey using the existing access point.
10. No scaffolding will be used in the River Clydach watercourse for these works.
11. An excavator will be required to excavate the existing ground for the new overflow structure. A dumper will be used to take the material off site.
12. Concrete repairs and repointing of the existing weir structure are likely to be required to maintain the overall integrity and to block up the existing weir when the new is operational.
13. Access will be over the canal bridge (Bridge South of Abbey reference 11834) or could potentially be through the grounds on Neath Abbey to allow concrete to be pumped over the canal.
14. Due to access reasons the work sequence is likely to start on the banks of the river first and then work towards the structure on the canal.
15. The works will not affect navigation or marking.

Reinstatement of surfaces: The excavation will be backfilled with the same material excavated. The existing surfaces will be reinstated with stone and grass as existing. The overflow weir will be surfaced with metal mesh flooring to allow pedestrians to walk along the tow path once works are complete.

Other relevant information: The plant and equipment used will be wheeled or tracked to reduce the risk of damaged to the existing surface of the structures.

Photos: As of the existing site features are as follows.

2.1.3. Photos of existing features



Photo 1: Access bridge over Tennant Canal to Towpath (Bridge South of Abbey reference 11834)



Photo 2: Access route along canal towpath to existing spillway/weir



Photo 3: Existing spillway/weir from Tennant Canal to River Clydach (Clydach Aquaduct on Tennant, reference 82339)



Photo 4: Location of proposed overflow weir adjacent to existing



Photo 5: Location of new overflow weir and discharge to River Clydach

2.1.4. Site Access

Access to the site will be via Monastery Road and then along the canal footpath. There may also be the requirement to use the access at Neath Abbey. All works will take place out of the water channel, however, there will be a need to place scour protection in the river at low tide. Therefore, plant will be required on the banks to construct these works, but plant will not sit within the River Clydach.

2.1.5. Site Compound and storage area

The site compound is likely to be located in an existing yard off the B4290 (Old Road). This is gated and fenced off. This location is away from any of the existing watercourses.

The site compound will be used to store construction materials, plant and machinery, site offices and basic welfare facilities (self-contained kitchen/toilets) for the contractors. The site compound will also contain a bunded storage area for diesel and fuels and all refuelling of plant will take place in the site compound. All fuels will be stored and handled in accordance with best practice procedures.

On completion, the site compound will be removed following construction activities and the area will be returned to its existing condition.

All materials for this Scheme, including the site compound units, will be delivered to site by road.

The site compound area for storage of the main plant is envisaged to be at the location below with plant and materials being transported from here to the weir location.



Figure 2-1 - Site Compound

2.1.6. Plant and Equipment to be used (with typical example photos)

No vessels are required for the works and all work will be undertaken using land-based machinery. The works are proposed to take place from the river banks and out of the water. However, for the scour protection works in the river this will require the placement of materials at low tide. It will also require the area in the river to be temporary bunding off with blockstone and the use of ton bags or sand bags to keep the area dry to complete this aspect of the works. This will require over pumping to complete this aspect of the works to keep the area dry. The over pumping will require the use of settlement tanks.

Typical plant that will be used to construct these works are shown below.



Figure 2-2 - Tracked excavator



Figure 2-3 - Wheeled JCB



Figure 2-4 - Wheeled dumper

2.1.7. Outline construction programme

A construction programme from a contractor is not available at present as a contractor will need to be procured for the scheme first. However, in terms of an outline programme it is envisaged that the duration of the works to the weir is likely to take 6 months, but is dependant on the time of year, weather and tidal state at the time.

The anticipated duration of the wider construction is approximately 12 months. Works are planned to take place December 2025, however this is dependent on Welsh Government funding for the scheme.

It is anticipated that all construction activities will be limited to daytime hours (for example, 7:30am to 6:00pm from Monday to Friday, and from 8:00am to 1:00pm on Saturdays, or similar). There will be no work over Christmas, New Year, Easter public holidays and Bank Holidays. There will be no night time working.

2.2. Operation

Operation of the works will commence as soon as the works are completed. The weir itself is self operating in that the weir will overflow from the canal and into the River Clydach at times of flood. There are no mechanical aspects involved with the weir that require operating. The weir does include provision for temporary stop logs to be installed in order for the client to maintain the structure. The client will install these stop logs during low flow periods to hold back water in the canal which will allow the overflow structure to be cleared as required.

No further works are expected once the site is in operation. Once established, the Scheme will be owned and managed by Neath Port Talbot Council.

2.3. Decommissioning

No decommissioning works are planned as part of the Scheme. Therefore, there are no potential pathways for impacts associated with decommissioning, and they have not been considered as part of the assessment.

3. Pre consultation

Pre-consultation correspondence was undertaken with the Maritime & Coastguard Agency (MCA) and Trinity House to confirm that the works for the Scheme would have no impact to navigation or marking in the area. Both parties responded and have no concerns to raise with regards to the safety of navigation.

4. Habitats Regulations

In the UK there is a network of conservation sites for rare and threatened species of birds and habitats. The network is comprised of Special Areas of Conservation (SAC) and Special Protection Areas (SPA). These sites are protected by the Conservation of Habitats and Species Regulations 2017 as amended (known as the Habitats Regulations). Following the UK's exit from the European Union (EU), the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 made changes to the 2017 Habitats Regulations so that the European sites no longer form part of the EU's ecological network but now form part of a UK national site network. They continue, however, to be referred to as 'European Sites' as they are part of the UK's international commitments to conservation conventions. The list of habitat types and species for which existing sites were designated, however, remain listed in Annexes I and II for the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (79/409/EEC).

In addition to the UK network of SACs and SPAs, many of the SPA sites are also designated as Ramsar sites. The Ramsar Convention on Wetlands of International Importance is an international mechanism which aims to protect internationally important wetlands, of particular importance to migratory bird species. In the UK, Ramsar sites are extended the same protection as SACs and SPAs and are therefore also considered in this HRA assessment.

The Habitats Regulations require 'competent authorities' to undertake an 'appropriate assessment' of plans, Schemes and strategies that are not connected to the management of the site and are likely to have a significant effect on the site. There is a similar requirement in relation to sites designated under the Ramsar Convention (Ramsar sites).

There are four distinct stages in the HRA process:

- **Stage 1:** Screening – the process which initially identifies the likely potential impacts on a European site, either alone or in combination with other plans or Schemes and considers whether these potential impacts are likely to be significant. This is often called a Test of Likely Significant Effect (TLSE).
- **Stage 2:** Appropriate Assessment (or AA) – the detailed consideration of the impact on the integrity of a European site of the plan or Scheme, with respect to the site's conservation objectives and its structure and function. This is to determine whether there will be adverse effects on the integrity of the site.
- **Stage 3:** Assessment of alternative solutions – the process which examines alternative ways of achieving the objectives of the plans or Schemes that avoid adverse potential impacts on the integrity of the European site.
- **Stage 4:** Assessment where no alternative solutions exist and where adverse potential impacts remain – an assessment of whether the development is necessary for imperative reasons of overriding public interest (IROPI) and, if so, of the compensatory measures needed to maintain the overall coherence of the site network.

On the basis of the above, this document presents the findings of Stage 1 (Screening) to support the Competent Authority making an AA of the Scheme.

5. Baseline

5.1. Statutory Designated Sites

Information on European designated sites² located within 10 km of the Scheme was obtained from the MAGIC³ and Natural Resources Wales (NRW)⁴ websites in July 2023. One Statutory Designated Site was identified within this 10 km search area; Crymlyn Bog/ Cors Crymlyn SAC (which is also designated as a Site of Special Scientific Interest (SSSI), Ramsar Site, and National Nature Reserve (NNR)), located approximately 3.3 km south-west of the Scheme (Figure 5-1). Apart from approximately 35 hectares of land at the northern end of Crymlyn Bog, the majority of the SAC shares the same boundary as the Ramsar site.

² Including: Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites.

³ www.magic.defra.gov.uk

⁴ <https://datamap.gov.wales/>

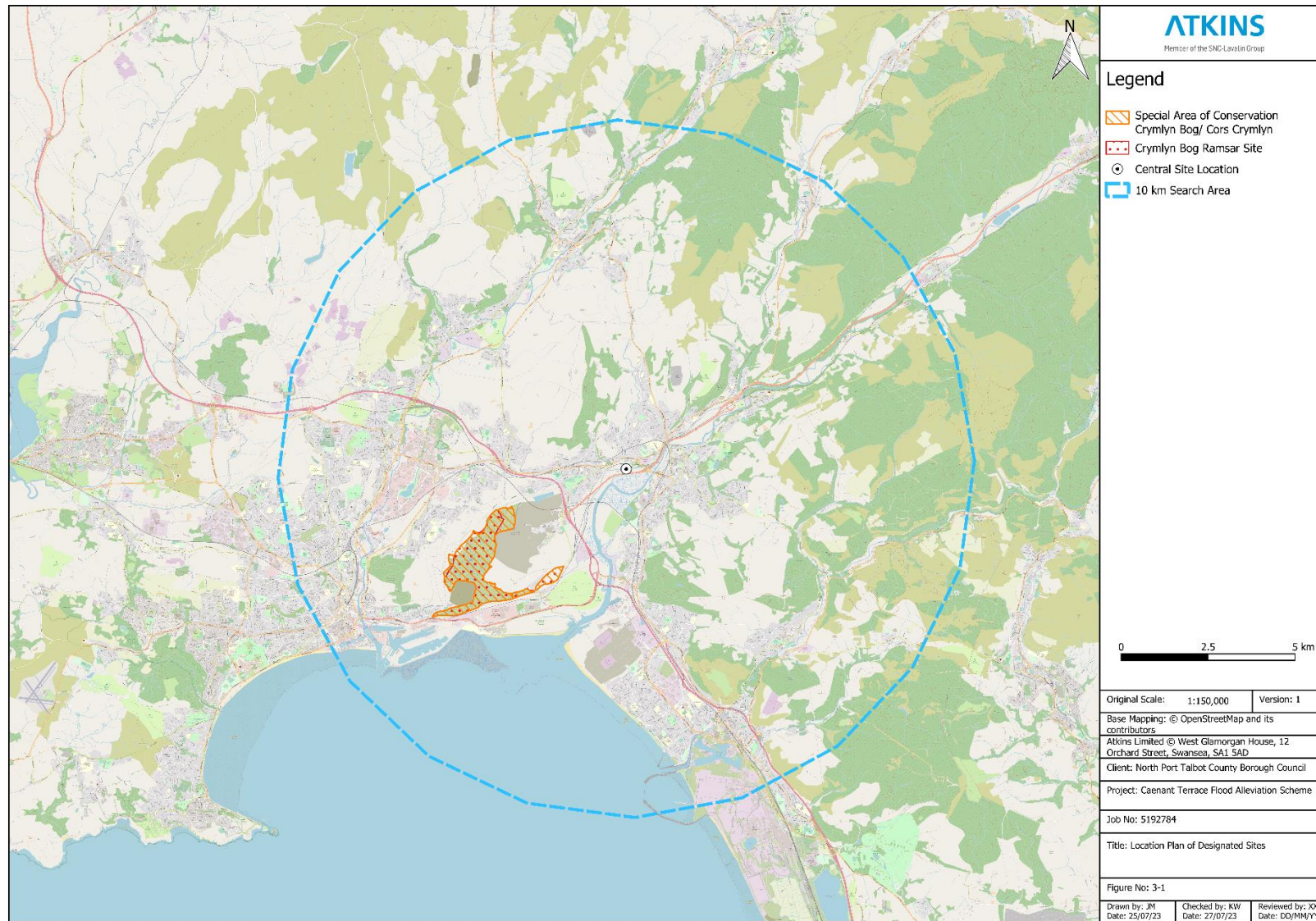


Figure 5-1 – Location Plan of Designated Sites

6. Site Interest Features

6.1. Crymlyn Bog / Cors Crymlyn SAC

The Annex I and Annex II habitat and species qualifying features of the Crymlyn Bog/ Cors Crymlyn SAC are presented in Table 6-1 below.

Table 6-1 – Qualifying Features of Crymlyn Bog/ Cors Crymlyn SAC

Feature	Quality and Importance
Crymlyn Bog / Cors Crymlyn SAC Selection (JNCC, 2015)	
Annex I Habitats that are a primary reason for selection	
Transition mires and quaking bogs	Internationally significant The condition of feature has been assessed as unfavourable, declining (in 2012)
Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>	Nationally significant Priority feature The condition of feature has been assessed as unfavourable, declining (in 2012)
Annex I Habitats present as a qualifying feature (but not a primary reason for selection)	
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)	Nationally significant Priority feature The condition of feature has been assessed as unfavourable, recovering (in 2012)
Annex II species that are a primary reason for selection	
Not applicable	Not applicable
Annex II species present as a qualifying feature (but not a primary reason for selection)	
Not applicable	Not applicable

6.2. Crymlyn Bog Ramsar

The Ramsar criterion for the Crymlyn Bog Ramsar are presented in Table 6-2 below.

Table 6-2 – Crymlyn Bog Ramsar Criterion

Feature	Quality and Importance
Crymlyn Bog Ramsar (JNCC 1993)	
Ramsar Criterion 1	
Largest example of valley floodplain topogenous mire in South Wales, and one of the largest surviving fens in the west of Britain. Very few other sites are known to support a comparable complexity and diversity of vegetation. Habitats Directive Annex I features present on the SAC include: H7140 Transition mires and quaking bogs H7210 Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>	Internationally significant Equates to topogenous fen SSSI feature. Includes above two SAC fen features (Features 1 and 2)

H91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i>	
Ramsar Criterion 2	
Supports a substantial population of the nationally-rare slender cotton-grass <i>Eriophorum gracile</i> , and a rich invertebrate fauna including many rare and highly localised species.	Nationally significant Equates to slender cotton grass SSSI feature Equates to invertebrate assemblage SSSI feature
Ramsar Criterion 3	
The site supports 199 vascular plant species including 17 regionally-uncommon and one nationally rare.	Nationally significant

7. Conservation Objectives

The conservation objectives for a European protected site are intended to represent the aims of the Habitats and Birds Directives in relation to that site. NRW provide advice on the conservation objectives and operations that may cause deterioration of the habitats or species, or disturbance of the species for which sites have been designated. This advice is in the form of 'Regulation 35 advice' for marine SACs (i.e. SACs with a marine component) or 'management plans' for other sites.

Measures taken under the Habitats Directive should be designed to maintain or restore habitats and species of European Community importance at / to "favourable conservation status" (FCS). The conservation objectives for a site set the standards which must be met if the features of the site (habitats and species) are to be at FCS.

FCS is defined in Article 1 of the Habitats Directive as:

Conservation status of a natural habitat means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2.

The conservative [sic] status of a natural habitat will be taken as 'favourable' when:

- Its natural range and the areas it covers within that range are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- Conservation status of typical species is favourable as defined in [Article] 1(i).

The conservation status of a species means the sum of the influences acting on the species concerned that may affect the long-term natural distribution and abundance of its populations within the territory referred to in Article 2.

The conservation status of a species will be taken as 'favourable' when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

The conservation objectives recognise and acknowledge that the features are part of a complex, dynamic and multi-dimensional environment which human activity has already modified and continues to modify to varying degrees and at varying spatial and temporal scales, either acutely or chronically.

The conservation objectives seek to prevent further negative modification of the extent, structure and function of natural habitats and species' populations by human activity and to ensure that degradation and damage to the features that is attributable to human activities or actions is prevented.

The conservation objectives, therefore, seek to:

- Encompass inherent dynamism rather than to work against it;
- Safeguard features and natural processes from those impacts of human activity that cause damage to the features through the degradation of their range, extent, structure, function or typical species; and

- Facilitate, where necessary, restoration of features or components of features that are currently damaged or degraded and in unfavourable condition.

The conservation objectives for the European protected sites and their features within a 10 km radius or potential area of the Scheme are set out below.

Although neither the Birds Directive nor the Ramsar Convention refer to FCS, Natural Resources Wales considers that the overall aim of both those legal instruments is sufficiently similar to FCS to make it practical and proportionate to use the same guiding principle when establishing the conservation objectives for SPAs and Ramsar sites, as well as SACs. Therefore the Habitats Directive definition of FCS is considered to provide the overarching framework for conservation objectives for all SACs, SPAs and Ramsar sites in Wales.

7.1. Site Conservation Objectives

The Site Conservation Objectives have been drawn directly from the NRW documents listed in Chapter 8 of the Core Management for Crymlyn Bog⁵.

The habitat features designated as part of Crymlyn Bog/ Cors Crymlyn SAC are as follows:

- Transition mires and quaking bogs
- Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*; and
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

Table 7-1 – Crymlyn Bog / Cors Crymlyn Conservation Objectives for SAC Special Features

To achieve favourable conservation status all the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve favourable conservation status.
Crymlyn Bog / Cors Crymlyn Special Area of Conservation (NRW, 2014)⁵
Habitat Features
Transition mires and quaking bogs
The transition mire should be of high quality throughout and composed of typical native species. The stands should be species-rich, with little or no rank vegetation or scrub encroachment. Non-native species and indicators of eutrophication and/or changing water levels should be largely absent. Providing these broad quality standards are met across the whole feature area, some heterogeneity in condition is both natural and acceptable, but the bulk (at least 60%) of the habitat should be referable to good quality transition mire, where: • Bottle Sedge is present at high cover; or, where the vegetation is composed of mixtures of: Bogbean, Marsh Cinquefoil, Water Horsetail, Common Cottongrass, Slender Cottongrass, Bottle Sedge, Bog Sedge, Star Sedge, Lesser Water-parsnip, Branched Bur-reed and the bog mosses <i>Sphagnum squarrosum</i> and <i>S. subnitens</i>; • Common Reed <i>Phragmites australis</i> is not dominant; • Purple Moor-grass, Greater tussock sedge, Tufted-sedge and Great Fen-sedge are not abundant; • Scrub is absent; and • Non-native species including Himalayan Balsam are absent. In addition to the above typical plant species, the transition mire areas will also contribute to the wider fen environment of Crymlyn Bog in supporting a range of typical fenland bird and invertebrate species. Factors affecting the extent and quality of the transition mire habitat (including water quality, atmospheric pollution, water levels, successional change, scrub encroachment and nonnative species) should be under appropriate control.

⁵ Core Management Plan Including Conservation Objectives for Crymlyn Bog / Cors Crymlyn Special Area of Conservation (SAC)/Crymlyn Bog RAMSAR Site (2014), Natural Resource Wales. Available online at: <https://naturalresources.wales/media/675011/crymlyn-bog-sac-english.pdf> [Accessed July 2023]

Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*

The calcareous fen should be of high quality throughout. At Crymlyn Bog the calcareous fen occurs in two forms: tall vegetation dominated by Great Fen-sedge *Cladium mariscus* and more open calcareous fen. The *Cladium* dominated areas should continue to be present as a minimum extent but should not increase at the expense of the open calcareous fen; ideally they should be opened up to allow increased plant diversity within them. The open calcareous fen should be species-rich, with little or no rank vegetation. Non-native species and indicators of eutrophication and/or changing water levels should be largely absent. Providing these broad quality standards are met across the whole feature area, some heterogeneity in condition is both natural and acceptable, but the bulk (at least 70%) of the open calcareous fen should be referable to good quality calcareous fen habitat, where:

- Tufted-sedge is present, with associates such as Yellow Loosestrife, Greater Spearwort, Blunt-flowered Rush, *Cyperus* Sedge, Lesser Bulrush, Water Dock, Purple-loosestrife, Hemp-agrimony, Marsh Cinquefoil and Royal Fern;
- Common Reed or Great Fen sedge are not dominant;
- Scrub is absent; and
- Non-native species including Himalayan Balsam are absent.

In addition to the above typical plant species, the calcareous fen areas will also contribute to the wider fen environment of Crymlyn Bog in supporting a range of typical fenland bird and invertebrate species.

Factors affecting the extent and quality of the calcareous fen habitat (including water quality, atmospheric pollution, water and non-native species) should be under appropriate control.

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)

The transition mire should be of high quality throughout and composed of typical native species. The stands should be species-rich, with little or no rank vegetation or scrub encroachment. Non-native species and indicators of eutrophication and/or changing water levels should be largely absent. Providing these broad quality standards are met across the whole feature area, some heterogeneity in condition is both natural and acceptable, but the bulk (at least 60%) of the habitat should be referable to good quality transition mire, where:

- Bottle Sedge is present at high cover; or, where the vegetation is composed of mixtures of: Bogbean, Marsh Cinquefoil, Water Horsetail, Common Cottongrass Slender Cottongrass, Bottle Sedge, Bog Sedge, Star Sedge, Lesser Water-parsnip, Branched Bur-reed and the bog mosses *Sphagnum squarrosum* and *S. subnitens*;
- Common Reed is not dominant;
- Purple Moor-grass, Greater tussock sedge, Tufted-sedge and Great Fen-sedge are not abundant;
- Scrub is absent; and
- Non-native species including Himalayan Balsam are absent.

The Ramsar features for Crymlyn Bog SAC are open to interpretation at present. They will be subject to a 'quality control' exercise in the future, to confirm the qualifying features. Hence the following list of Ramsar features is only provisional at present. Conservation objectives for the Ramsar features will be developed once the confirmed list of features has been agreed.

The features designated as part of the Crymlyn Bog Ramsar Site are as follows:

- Topogenous fen (equates to topogenous fen SSSI feature);
- Slender cotton-grass (equates to slender cotton-grass SSSI feature);
- Peatland invertebrate assemblage (Equates to invertebrate assemblage SSSI feature); and
- Plant species assemblage

Conservation objectives for Ramsar features are currently to be developed, excluding topogenous fen which are to be developed with reference to the conservation objectives for transition mires and quaking bogs, and calcareous fens as listed for the SAC in Table 7-1 above.

8. Stage 1 - Screening

8.1. Likely Significant Effects – Alone

The Skewen Flood Alleviation Scheme will take place 3.3 km east of the Crymlyn Bog/ Cors Crymlyn SAC and Ramsar site.

Table 8-1 sets out the features of the SAC and Ramsar site, the potential impacts and the potential mechanism of impact and the screening result.

Table 8-1 – HRA Screening Table of Likely Significant Effects

Site	Potential Impact	Potential Cause of Impact	LSE? (Y/N)
Crymlyn Bog / Cors Crymlyn SAC - Transition mires and quaking bogs - Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> - Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)	Habitat loss / Physical damage	None of the works will take place in the SAC. Due to the distance of the SAC from the footprint of the Scheme, and the low impact nature of the works, no direct or indirect loss of habitat is anticipated.	N
	Disturbance (e.g. physical)	None of the works will take place in the SAC. Due to the distance of the SAC from the footprint of the Scheme, and the low impact nature of the works, no disturbance to habitats is anticipated.	N
	Accidental pollution during construction, maintenance and repair works	Due to the distance of the SAC from the footprint of the Scheme, and the low impact nature of the works, no accidental pollution during construction, maintenance and repair works is anticipated to have an impact on habitats within the SAC. There is a chance accidental pollution could enter the watercourse in the footprint of the works and impact habitats further downstream/ in coastal areas. However, due to the SAC being upstream in a different area to the works, there is no hydrological connection between the site and the SAC.	N
Crymlyn Bog Ramsar Habitats - Topogeneous mire - Transition mires and quaking bogs	Habitat loss / Physical damage	None of the works will take place in the Ramsar. Due to the distance of the Ramsar from the footprint of the Scheme, and the low impact nature of the works, no direct or indirect losses of habitat is anticipated.	N

Site	Potential Impact	Potential Cause of Impact	LSE? (Y/N)
- Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> - Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) Species - Slender cotton-grass - Priority vascular plant species	Disturbance (e.g. physical)	None of the works will take place in the Ramsar. Due to the distance of the Ramsar from the footprint of the Scheme, and the low impact nature of the works, no disturbance to habitats is anticipated.	N
	Accidental pollution during construction, maintenance and repair works	Due to the distance of the Ramsar from the footprint of the Scheme, and the low impact nature of the works, no accidental pollution during construction, maintenance and repair works is anticipated to have an impact on habitats or species within the Ramsar. There is a chance accidental pollution could enter the watercourse in the footprint of the works and impact habitats further downstream/ in coastal areas. However, due to the SAC being upstream in a different area to the works, there is no hydrological connection between the site and the Ramsar.	N

8.2. Likely Significant Effects – In-combination

At the time of writing this report, no other schemes have been identified in areas near to the Skewen Flood Alleviation Scheme that have the potential for combined LSE to the Crymlyn Bog/ Cors Crymlyn SAC and Ramsar site.

8.3. Stage 1 Screening Conclusion

The Scheme is not anticipated to have any LSE on the Crymlyn Bog/ Cors Crymlyn SAC and Ramsar site due to distance of the European designated site from the footprint of the Scheme in combination with the low impact nature of the works. Therefore, a Stage 2 – Appropriate Assessment for HRA will not be undertaken.

In-combination effects have been considered as part of this assessment and it has been concluded that there are no other plans or projects that could have the potential for any LSE in-combination with the Scheme.

Appendix A. Scheme Drawings

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