gwerth mewn gwahaniaeth
delivering on distinction

Morlais Project

Terrestrial Ecology Assessment Update

Applicant: Menter Môn Morlais Limited

Document Reference: PB5034-RHD-ZZ-XX-NT-Z-1000

Author: Royal HaskoningDHV

Royal HaskoningDHV
Enhancing Society Together

Morlais Document No.	Status:	Version No:	Date:
MOR/RHDHV/DOC/0110	FINAL	F1.0	26/03/2020

[Page left intentionally blank]

1 Introduction

This document presents the updated Environmental Statement (ES) impact assessment for terrestrial ecology that has been undertaken following design refinement by Menter Môn and in response to comments raised by Natural Resources Wales (NRW) and Royal Society for the Protection of Birds (RSPB) following the submission of the Morlais Project ES (Document Reference PB5034-ES) and the Information to Support Habitats Regulations Assessment (HRA) (hereafter referred to as the HRA) (Document MOR/RHDHV/DOC/0067).

A meeting was held with NRW on the 13th December 2019 to discuss the construction and operational phase impacts to the Glannau Ynys Gybi / Holy Island Coast Site of Special Scientific Interest (SSSI) / Special Protection Area (SPA) / Special Area of Conservation (SAC) and grassland habitat during the cable installation works for the landfall of the Morlais export cables. This document reflects updates made in response to this meeting.

This document should be read in conjunction with the following Drawings, which are appended to the end of this document:

- **Drawing 1**: 122938-BVL-Z0-00-DR-C-00600.P02-S2; and
- **Drawing 2**: 122938-BVL-Z0-00-DR-Z-00003_P04.

Further details on the project and ecology survey and assessment works undertaken to date, including habitat maps, is provided in Chapter 19 Onshore Ecology of the ES. The information contained within this document provides further detail and an update on the methods which will be employed during the construction, maintenance and decommissioning activities of the Project and the potential impacts which may occur during each of these phases of development.

The present document considers the potential impacts to the terrestrial ecology receptors and the ES and HRA assessment and does not consider impacts to chough, which are considered separately (provided in note MOR/RHDHV/DOC/0120).

A series of documents submitted as part of the TWAO application are referred to and are relevant to this document as they contain important mitigation and emergency response plans in relation to the construction and operation of the project. The two most relevant are:

CoCP - Code of Construction Practice: Document MOR/RHDHV/DOC/0076:
PPMP – Pollution Prevention and Management Plan: Document MOR/RHDHV/DOC/0077:

1.1 Definition of terminology

The Onshore Development Area was defined and presented in the ES as the area within which landfall, landfall substation, cable routing, onshore substation and all associated activities would be located.

The Project refers to the proposed Morlais Demonstration Zone and associated infrastructure.

2 Baseline Environment

Holy Island has cliffs of hard rock and also supports important examples of coastal cliff heathland vegetation. Extensive areas of heathland are present in the western part of the island, these occur primarily within the Glannau Ynys Gybi / Holy Island Coast SSSI/SAC and Tre Wilmot SSSI.

Beddmanarch-Cymyran SSSI is located at the east end of the Onshore Development Area.

Small areas of coastal heath occur on the various small headlands between South Stack and Trearddur Bay, in amongst areas of maritime grassland. These areas of heathland are dominated by heather *Calluna vulgaris* and western gorse *Ulex gallii* with occasional cross-leaved heath *Erica tetralix*, bilberry *Vaccinium myrtillus*, purple moor-grass, spring squill, and deer grass *Trichophorum cespitosum*.

2.1 Glannau Ynys Gybi / Holy Island Coast SPA

The Glannau Ynys Gybi / Holy Island Coast SPA lies within the footprint of the Onshore Development Area and is characterised as sea cliffs with cliff top grassland, offshore stacks and islets and maritime heath.

The SPA supports a resident, breeding population of chough *Pyrrhocorax pyrrhocorax*, which depends on the diverse mix of habitats and their low intensity agricultural management. Qualifying species are as follows:

- Chough *P. pyrrhocorax*, 18 pairs representing at least 5.3% of the breeding population and at least 2.6% of the wintering population in Great Britain.

2.2 Glannau Ynys Gybi / Holy Island Coast SAC

Glannau Ynys Gybi / Holy Island Coast SAC lies within the footprint of the Onshore Development Area. Annex I habitats that are a primary reason for selection of this site are as follows:

- Vegetated sea cliffs of the Atlantic (and Baltic) Coasts: maritime heath with spotted rock rose *Tuberaria guttata* and extensive cliff-crevice and grassland communities; and
- European dry heaths: the most important site in North Wales for maritime dry heaths. The main NVC types are H7 *Calluna vulgaris – Scilla verna* heath and H8 *Calluna vulgaris – Ulex gallii* heath Small areas of wet heath; grassland, heath, bracken and bramble scrub zonation. The heath is an important locus for spotted rock-rose *Tuberaria guttata*.

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

- Northern Atlantic wet heaths with *Erica tetralix*.

RSPB have requested during consultation (Project Meeting Minutes, RSPB South Stack Reserve, 24/01/2018) that the Project avoids impact to the heath habitat entirely due to its importance for breeding / foraging chough.

Following the site selection process to define the working footprint of the Project, areas of wet or dry heath have not been recorded during the Extended Phase 1 Habitat Survey (EP1HS) within the Onshore Development Area and therefore it is concluded that these habitat types are absent from the locations

where the landfall activities will be undertaken. As such, wet and dry heath habitat is not considered further within this document and there is no change to the assessment presented in the ES for these habitats.

2.3 Glannau Ynys Gybi / Holy Island Coast SSSI

Glannau Ynys Gybi / Holy Island Coast SSSI is within the footprint of the Onshore Development Area. This SSSI is designated for heathland, maritime grassland, coastal cliffs and ledges, a variety of vascular plants (heathland and maritime species), birds (seabirds, peregrine, chough and heathland species), invertebrates and geology. Key habitats (i.e. heathland, maritime grassland, coastal cliffs and ledges, a variety of vascular plants) of the SSSI are also designated within the SAC and the designations are considered together. Impacts relating to birds are considered separately and not included in this document (to be provided in note PB5034-RHD-ZZ-NT-Z-1001).

2.4 Tre Wilmot SSSI

Tre Wilmot SSSI is located at least 356m from the footprint of the Onshore Development Area and is designated for lowland heath and rocky ridges with intervening depressions with a range of heathland vegetation communities, including wet heath and peatland communities, and small open water areas. There is no change to the assessment conclusions of no significant impacts presented within the ES for this site and therefore it is not considered further within this document.

2.5 Beddmanarch-Cymyran SSSI

Beddmanarch-Cymyran SSSI is located at least 105m from the Onshore Development Area at the eastern end of the Onshore Development Area and is designated for supporting a variety of coastal habitats including sandbank, mudflat, saltmarsh, dune heath. It is also important for overwintering and breeding birds and saltmarsh plant species and eel grass. There is no change to the assessment of no significance impacts presented within the ES to this site and therefore it is not considered further within this document.

3 Key habitats in the vicinity of cable landfall:

3.1 Maritime cliff and slope

The sea cliffs around South Stack and the Range in the western part of Holy Island support a diverse vegetation community including thrift *Armeria maritima*, primrose, sea beat, sea squill, common scurvy grass, bladder campion, kidney vetch *Anthyllis vulneraria*, buck's-horn plantain *Plantago coronopus*, western gorse, and blackthorn *Prunus spinosa* scrub.

A number of nationally rare plant species are known to occur on these cliffs (NRW, 2018), as described in the Glannau Ynys Gybi / Holy Island Coast SSSI citation, including South Stack fleawort *Tephroseris integrifolia sp. maritima*, spotted rock rose *Tuberaria guttata* and rock sea lavender *Limonium britannicum sp. celticum* and also various bryophytes and ferns. Exposed rock is frequent on the cliffs. Where this habitat falls within the boundary of the SAC at the top of the cliffs, it is considered part of the vegetation sea cliffs of the Atlantic (and Baltic) Coasts Annex I habitat which contributes to the designation of the site.

3.2 Unimproved neutral grassland

Unimproved neutral grassland is uncommon and generally limited to small patches of maritime grassland on steeper slopes and along the top of cliffs in the west part of Holy Island (Abraham's Bosom, where landfall will take place) and at the top of the small cliffs to the south of the road between South Stack and Trearddur Bay. This unimproved grassland has the character of maritime grassland, supporting cock's-

foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus* and red fescue *Festuca rubra*, with occasional sorrel *Rumex acetosa*, bladder campion *Silene vulgaris*, spring squill *Scilla verna*, primrose *Primula vulgaris*, common scurvy grass *Cochlearia officinalis*, and wild carrot *Daucus carota*. Where this habitat falls within the boundary of the SAC, it is considered part of the vegetation sea cliffs of the Atlantic (and Baltic) Coasts Annex I habitat which contributes to the designation of the Glannau Ynys Gybi / Holy Island Coast SAC.

3.3 Improved grassland

Many of the fields are grazed and improved, supporting a high proportion of perennial rye grass *Lolium perenne* and few other species.

3.4 Poor semi-improved grassland

The low-input short-sward semi-improved pasture fields provide suitable foraging habitat for chough. Some of these fields in the western part of the Onshore Study Area are managed by the RSPB to provide habitat for chough, which are known to nest within the Holy Island Coast SPA.

3.5 Field boundaries

The field boundaries on Holy Island vary. Many are formed by mortared stone walls (particularly adjacent to wider roads) and dry-stone walls. There are traditional vegetated stone walls/earth banks (cloddiau) within the Onshore Development Area (Figure 19.5, Volume II of the Morlais ES). These occur more frequently beside minor roads and as internal field boundaries. They are mainly found in the west part of Holy Island, including the footprint of the landfall. Post and wire/rail fences, natural banks and rocky outcrops, and occasionally hedgerows also form some of the field boundaries (Figure 19.6, Volume II of the Morlais ES).

Cloddiau can support a wide variety of plant species (such as primrose, red campion, wild carrot, Alexanders, yarrow *Achillea millefolium*, foxglove *Digitalis purpurea*, scurvy grass, creeping thistle *Cirsium arvense*, wood sage *Teucrium scorodonia*, bluebell, gorse, bracken and bramble). A number of Cloddiau are located within the Onshore Development Area in the vicinity of the landfall area and will need to be crossed by the cable route.

Hedgerows within the Onshore Development Area have been assessed as being species poor and are both continuous and defunct in structure.

4 Consultation

Following the submission of the ES and HRA documents, NRW and RSPB have provided comments. A meeting was held with NRW on the 13th December 2019 to discuss further their comments. Table 4.1 details all the relevant comments received from NRW and RSPB as part of the ES consultation and how they have been addressed.

Table 4.1 Consultation with NRW and RSPB

Comment Number	Comment Detail	Morlais Response
Comments from NRW on ES		
1	Section 19.5.2.1, para. 100 refers to the HRA screening of impacts on SAC habitats, but there is no indication of where SSSI features are assessed. Clarification is sought on this.	Ecological features of the SSSI overlap with the designated features of the SAC. Information relating to the SSSI is presented in Section 19.6.5
2	Table 19-16: Landfall options refer to removal of 900m³ of material for HDD or 8,800m³ for trenching. NRW Advisory seeks clarification on where this will be stored. If the trench is 10m wide x 550m long soil storage will require a very large area which has not, to our knowledge, been identified. This could have impacts on protected habitats and species such as chough.	Locations shown on Drawing 2 (Ref: 122938-BVL-Z0-00-DR-Z-00003) shows locations of stockpile areas
3	Paragraph 210 concludes that HDD will result in no impact on the Holy Island Coast SAC/SPA/SSSI. However, it is unclear whether there will be large volumes of spoil around the exit pit: if so, measures will be needed to ensure no sediment laden run-off flows down the cliff before concluding no impact is likely.	Sediment run-off is considered in Section 6.1.1 of this document
4	Paragraph 211 assesses impact on vegetated sea cliff as a percentage of the whole site, which is largely heathland. NRW Advisory considers that the assessment should be based on the percentage of the feature i.e. vegetated sea cliff. No dimensions are given for the J-tubes or colour/materials or fixing methods. NRW Advisory considers that disturbance of a 90m corridor up the vegetated sea cliff could result in long-term impacts as soil development and vegetation growth is extremely slow in these challenging conditions.	Percentages have been re-calculated and presented as a % of the area of the SAC feature Methodology updated in Section 5and assessment updated in Section 6 of this document
5	Paragraphs 212, 223 & 369 state that permanent habitat loss may occur on the cliff face. This would appear very likely if J-tubes are pinned to the cliff in shallow slots; NRW Advisory therefore suggests that this tentative statement should read "will occur". Decommissioning may cause more damage in the future and would need separate assessment. NRW Advisory seeks clarification on how much maintenance/inspection will be needed for the J-tubes as it is likely to be an extremely challenging environment to maintain anything attached to the cliffs and any known need for regular actions should be built into the assessment.	Methodology, including maintenance is updated in Section 5 and assessment updated in Section 6 of this document
6	Paragraphs 212, 223 & 369: NRW Advisory disagrees with the conclusion that there will be no impact on the Holy Island Coast SAC/SPA/SSSI site integrity. No figures have been presented showing percentage of the sea cliff feature that will be affected and presenting it as a percentage of the whole site is disingenuous. Disturbed sea cliff vegetation in exposed locations may be very slow to recover in this exposed location leading to a potential medium to long-term impact.	Percentages have been re-calculated. Assessment updated in Section 6 of this document

Comment Number	Comment Detail	Morlais Response
7	Paragraph 218 refers to cables being temporarily pinned to the cliff if HDD is not possible. However, if this is for the duration of the project, i.e. 37 years, NRW Advisory considers this to be a permanent impact (as defined in Table 5-5 of the ES, Volume I), rather than 'temporary'. The same paragraph refers to reinstatement of temporarily lost or disturbed habitat. If the same interpretation of 'temporary' is used reinstatement may not occur until after the end of the project, which NRW Advisory cannot agree with.	Assessment updated in Section 6 of this document
8	Paragraph 219: Considering that the trench is described as up to 10m wide with a 30m wide working corridor, turf storage would be expected to take up a 10m wide strip leaving just 10m of the 30m wide working corridor for vehicle movements and soil storage etc. NRW Advisory is therefore concerned as to whether the proposed turf reinstatement method would be workable. As a minimum there should be a temporary fence preventing vehicles driving on the edge of the stored turf. Turf would need watering in windy weather as well as dry.	Locations shown on Drawing 2 (Ref: 122938-BVL-Z0-00-DR-Z-00003) and methodology discussed in Section 5 Assessment updated in Section 6 of this document
9	Paragraphs 220-224: NRW Advisory considers that turf management will help regarding grassland habitats but cannot, as stated, ensure that habitat recovers quickly as other factors such as weather will influence success. Removal of turf from vegetated cliffs is likely to remove much of the soil in some areas at least, leading to difficulties in re-establishment. Also, sea cliff turf cannot be stored on the adjacent cliff vegetation.	Assessment updated in Section 6 of this document and includes for challenges of turf re-establishment
10	Paragraphs 220-224 appear to assume that loss of habitat can be compensated for elsewhere, although this is not explicitly stated. The proposed Habitat Management Plan proposals appear to be similar to other proposals that NRW Advisory has seen but given the nature of the sea cliff habitat likely to be lost it is difficult to see how new habitat could be created.	Assessment updated in Section 6 of this document. Biodiversity net gain is discussed in Section 8 of this document.
11	Paragraph 222: Materials and plant should be stored outside the designated sites' boundary. There should be no need for storage within the designated sites.	Assessment updated in Section 6 of this document and includes for no storage within the designated site
12	Paragraph 225: NRW Advisory considers the expectation that disturbed grassland can recover within one year is overly optimistic. It is likely that a number of species will still be absent then and may only recover after a considerable number of years - depending on availability of seed sources.	Assessment updated in Section 6 of this document
13	Paragraph 348 mentions a pre-construction survey of INNS and then states that an INNS management plan specific to knotweed will be produced. NRW Advisory considers that this plan should address any INNS found during the survey, not just knotweed.	Updated mitigation in Section 5 of this document to consider the known knotweed stands at the site and any INNs subsequently recorded
14	Paragraph 349: NRW Advisory recommends that the treatment of known knotweed stands in or adjacent to the development zone during the season before work commences would be good practice. Since the works involve excavation of a trench and possible dispersal of root material there is a significant risk of spreading knotweed during the construction and/or operational phase. The applicants must be made aware that it is an offence to spread knotweed and must adopt robust policies and good working practices to address this.	Updated mitigation in Section 5 of this document includes for treatment of knotweed and measures to prevent spread

Comment Number	Comment Detail	Morlais Response
15	Paragraph 357: There is no mention of the J-tubes which, if used, would presumably be removed and be part of the decommissioning plan referred to. Further clarification is sought on this.	Assessment updated in Section 6 of this document includes for decommissioning activities
16	Table 19-25: Clarification is sought over what this table is intended to explain.	This table identifies where potential interactions occur between potential impacts upon terrestrial ecology
17	Paragraph 370: NRW Advisory disagrees that habitat loss will be temporary: some at least will be >37 years which we would consider long term and possibly permanent.	Assessment updated in Section 6 of this document
18	Paragraph 371: NRW Advisory disagrees with this conclusion because it is based on the total area of the designated site, not the area of the designated habitat affected.	Assessment updated in Section 6 of this document including updated percentages based on the feature
19	The application makes reference that an Environmental Clerk of Works will be employed. Details of this person, along with their qualifications, licencing and contact details should be forwarded to NRW as early as possible. NRW Advisory would expect this person to be the main point of contact for all ecological matters during this work.	Mitigation updated in Section 7.1 of this document includes for EcoW details to be sent to NRW
20	NRW Advisory considers that pre-construction surveys to be carried out for protected/invasive species should inform the micro-siting of the onshore cable route to avoid any sensitive species.	Mitigation updated in Section 7.1 of this document includes for pre-construction surveys to inform micrositing
21	Although there is a preference expressed for Horizontal Directional Drilling (HDD) there is relatively little information provided about the alternative trenching method and what there is, is inconsistent. The shadow HRA (para. 997) refers to shallow slots down the cliff with cables pinned into them, but this refers to J-tubes or split ducts. Between the different documents it is unclear what is the preferred option and NRW Advisory has found no information about how wide the J-tubes are or whether they will be "pinned" to the cliff. If extensive drilling is required then consideration should be given to noise, dust and bird impacts. Given the lack of clarity as to what is proposed it is difficult to assess impacts on the Holy Island Coast SAC. NRW Advisory seeks clarification on how shallow slots would be cut into the cliff and how this would be done without major permanent damage to the SAC feature.	Methodology updated in Section 5 and assessment updated in Section 6 of this document to provide greater clarity
22	NRW Advisory disagrees with the conclusions regarding the impact on the Holy Island Coast SAC because calculations of the potential impact on the SAC are based on the percentage of the whole SAC area rather than the area covered by the designated feature i.e. vegetated sea cliff.	Assessment updated in Section 6 of this document including updating the percentages based on the feature
23	NRW Advisory disagrees that habitat loss associated with the worst-case open trenching method (if required) would be temporary; we consider that some at least will last for longer than the 37-year operational period and hence could be considered permanent (as defined in Table 5-5 of the ES, Volume I).	Assessment updated in Section 6 of this document

Comment Number	Comment Detail	Morlais Response
24	NRW Advisory also has significant concerns about the suggested ease of reinstatement of disturbed vegetation, including vegetated sea cliff habitat, in such a challenging environment.	Assessment updated in Section 6 of this document including for challenges associated with reinstatement of habitat
25	Paragraph 993 states that entry and exit pits will be set back 10m from sensitive coastal habitats. NRW Advisory considers that 10m is not a very large buffer between major works (transition pits are stated to be 15x85m x 1.5m deep) and sensitive habitats - it would be preferable to have a greater buffer where space permits.	Methodology updated in Section 5 of this document and transition pits will be minimum 220m back from the cliff. The nearest stockpile area will be 19.5m away
26	Paragraphs 995, 996 & 1001: NRW Advisory disagrees with the conclusion that there will be no impact on SAC site integrity. No figures have been presented showing percentage of the sea cliff feature that will be affected and presenting it as a percentage of the whole SAC gives an inaccurate picture of the extent of impact on this habitat. Disturbed sea cliff vegetation in exposed locations may be very slow to recover in this exposed location leading to a potential medium to long-term impact.	Assessment and percentages updated in Section 6 of this document
27	Paragraph 997: It should be stated here that not only will materials and equipment be stored within the construction footprint, but they will be stored outside the designated site boundary.	Methodology updated in Section 5 of this document to include for no storage in the designated site boundary
28	We advise that further work to reduce the impact on hedgerow and cloddiau due to their removal is made - possibly using HDD at these locations. NRW would expect that if the removal of any hedgerow or cloddiau cannot be avoided, a licenced ecologist or Environmental Clerk of Works (ECoW) should be on site to provide the necessary expertise. The qualifications, licencing and contact details for this person should be forwarded to NRW as early as possible. NRW would expect this person to be the main point of contact for all ecological matters during this work.	Mitigation updated in Section 7.1 of this document to use trenchless crossings for cloddiau and any sensitive / important hedgerows
29	We would question whether the level of permanent lighting at the substations (110 Lux) is low enough.	Mitigation updated in Section 7.1 of this document to include guidance for lighting
30	Pre-construction surveys to be carried out for protected/invasive species should inform the micro-siting of the onshore cable route to avoid any sensitive species.	Mitigation updated in Section 7.1 of this document to include pre construction surveys
Comments on ES from RSPB		
1	Based on the information provided, it is not clear on the extent of impact, in terms of direct permanent or temporary loss or fragmentation, on SSSI and SAC habitat features and land outwith the designated sites. This is dependent on whether horizontal direct drilling (HDD) is possible: a decision the applicant has not yet made and therefore is not able to provide clarity on in its ES and HRA documentation. If HDD is not possible and trenching is adopted, the impact on designated site habitats is not clear, including the extent and permanence of any habitat loss.	Methodology updated in Section 5 and assessment updated in Section 6 of this document

Comment Number	Comment Detail	Morlais Response
2	Based on our analysis below, we do not consider the mitigation measures proposed meet the legal requirements of ruling out an adverse effect on site integrity beyond reasonable scientific doubt, as they leave too many issues to be resolved post-consent, not least the choice of technology to lay the cable. As the applicant notes, this is critical to the question of whether or not there will be impacts that need to be avoided through mitigation measures. Such an important issue cannot be left to the post-consent period as the competent authority would not have been able to rule out an adverse effect on integrity (see section 2 above).	Methodology updated in Section 5and assessment updated in Section 6 of this document
3	If adverse effects cannot be avoided, then the competent authority will need to consider the strict derogation tests under the Habitats Regulations (see section 2 above). Any reliance on the derogation tests will require the requisite information on alternative solutions, imperative reasons of overriding public interest and compensatory measures to be provided such that the competent authority is satisfied the tests are met. At this stage, the relevant information is not available. Mitigation measures (dependent on the adopted cable landfall working method) are not clearly presented and are reliant on further post-consent discussions with NRW and IOACC prior to construction. The applicant proposes that adopted mitigation measures will be captured in an Ecological Action Plan (EAP) which will be subject to review by NRW and IOACC prior to construction. For the reasons given above, we consider this would conflict with the requirements of the Habitats Regulations.	See Section 9 of this note
4	The ES and HRA appear to be confused over the definitions of mitigation and compensation in the context of the Habitats Regulations. Mitigation measures are those designed to avoid or reduce adverse effects, in this case on protected areas including European sites. Compensation measures are those designed to offset residual adverse effects. In the case of residual adverse effects on European sites, they can only be considered once the competent authority is satisfied there are no less damaging alternative solutions to the proposed scheme and that any damage is justified for imperative reasons of overriding public interest.	See Section 9 of this note
5	The RSPB considers there is insufficient information provided to fully assess the potential impacts of the cable landfall on protected habitats. The application should include further details on the extent and permanence of habitat loss and fully assess the potential impacts on protected habitats. The mitigation hierarchy should be applied. As set out in section 2 above, for mitigation to be relied upon to rule out an adverse effect on integrity, the competent authority must be certain the measures will make an effective contribution to avoid harm i.e. it is beyond reasonable scientific doubt. At present, the lack of detail on the technology to be used, combined with a lack of detailed analysis of the likely success of habitat restoration should the cable be trenched, means the competent authority cannot rely on the proposed mitigation to rule out an adverse effect.	Methodology updated in Section 5and assessment updated in Section 6 of this document
6	In addition, any mitigation or compensation measures should be clearly presented, agreed and legally binding. The details of the compensatory habitat including agreements for securing the land, the habitat creation, management and monitoring and funding throughout the project lifetime need to be legally secured in the TWAO and HRA consent and must be evidence based to achieve functionality of habitat lost before the damage occurs. Should compensation be necessary, there is wide acknowledgement that compensation ratio	See Section 9 of this note

Comment Number	Comment Detail	Morlais Response
	should generally be well above the intended 1:1 ratio referred to in para 224 of ES Chapter 19. (Commission Notice 2018, "Managing Natura 2000 sites; The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC" para 3.7.13 Extent of Compensation.)	
7	Pre-construction checks for barn owl should also include mature trees.	Mitigation updated in Section 7.1 of this document
Comment from IoACC on ES		
1	The Council therefore requests that the Promoter identifies appropriate enhancement measures and that these are secured in the Ecological Action Plan (EAP). The Council would therefore suggest that the EAP is amended to be a 'Mitigation, Enhancement and Management Plan' to reflect its scope.	Biodiversity Net gain is discussed in Section 8
Comments from NRW on first draft of ecology note PB5034-RHD-ZZ-XX-NT-Z-0200, provided 19/03/2020		
1	A satellite compound is shown on Drawing 1 close to the cliff. We would advise that anything in this compound be made storm-proof. In recent storms a Portaloo blew over on a nearby RSPB construction site. Any incidents in the satellite compound are very close to SAC cliff vegetation and could therefore have serious impacts.	All compounds will be established in accordance with the level of exposure to the environment and the anticipated weather conditions. All compounds are to be secured via perimeter fencing which will be appropriate to the prevailing conditions (e.g. storm proofing) (See Section 5).
2	Drawing 2: Concrete apron at toe of cliff – up to Highest Astronomical Tide. There is a need to assess whether any qualifying SSSI features are present in this area: rockpools, caves and overhangs under boulders	These features do not appear on the citation for the SSSI https://naturalresources.wales/media/656113/SSSI_0963_Citation_EN001c75d.pdf
3	Drawing 2 shows the wrong SSSI boundary at the north-west end of the area where cables come ashore. It should follow mean low water but at c SH215815 the low water mark disappears and only the high water boundary is left.	Drawing 2 has been amended to better define the SAC boundary
4	The areas shown for stockpiles still seem quite small relative to the volumes of material to be stored, even allowing for opening trenches in short sections. Turf storage usually requires a lot of space.	For the construction phase of the project, a detailed Materials Management Plan will be developed by the contractor and submitted for acceptance by the client. All construction works will be programmed and undertaken to meet any planning and environmental constraints that are imposed on the works. It is however anticipated that the works will be phased to minimise environmental impact and disruption to local receptors. Construction of the works will be phased to suit available land take (e.g. stockpile and laydown areas) which

Comment Number	Comment Detail	Morlais Response
		will accommodate the temporary storage of turf as required. (See Section 5).
5	Para. 2.4: Tre Wilmot appears to be over 700m from the nearest works, yet this paragraph says at least 36m. Is there additional work of which we are unaware which isn't shown on the Drawing? Assuming the map is correct the conclusion in this paragraph is correct, even if the presented facts are wrong.	This has been re-calculated
6	Para. 5.2.1: The stockpile will be a minimum of 19.5m back from the cliff edge; this seems extremely precise, suggesting that space may be very tight – any sediment runoff prevention measures should be within the stockpile area, not even closer to the cliff vegetation.	No detailed topographical survey of the site has been undertaken, the 19.5m is an estimated scaled distance based on OS mapping. It has been provided for guidance and information only. Should environmental limitations dictate that the boundary is to be moved further from the sensitive habitat then this will become a constraint within which the contractor will need to work. As with all embankments, due consideration will be given to pluvial runoff and suitable protection measures put in place. Any surface water drainage discharge will be in agreement with the landowner or governing authority. The type of and extent of protection provided will be in accordance with usual construction practises and standards. (See Section 5).
7	It is essential that the existing vegetation in the location of Options A, B and C is surveyed to determine a baseline. NRW suggest a Phase II National Vegetation Classification (NVC) Survey (by NRW approved contractors with relevant qualifications and experience in surveying vertical cliff face vegetation). The NVC survey should take extend at least 20m from the cliff top inland and should finish at break of slope on the seaward side. Fixed point photographs should be used as part of the survey procedure.	Included within survey methodology. Options B and C were discounted prior to application due to significant areas of fractured rockface (B) and access restrictions for construction machinery / proximity to only public right of way to beach (C). Both Options B and C would also require impacting a larger section of cliff and vegetation than Option A. A is the most stable area for pinning the cables to.
8	There are numerous references to cliff survey, including suggestions that a drone may be used. A roped-access botanical survey by a suitably-qualified botanist will also be needed as we do not believe that a drone will give adequate resolution to identify small specimens of rare plants. This should also include photography of the cliff face to give an idea of density of the plant growth. Our final assessment of the impacts of this proposal will have to be done after the cliff vegetation survey as we will have insufficient information to comment prior to that.	Included within survey methodology (See Section 5).

Comment Number	Comment Detail	Morlais Response
9	Para. 5.2.1, top of page 14: this refers to excavation of the trench with an excavator with “breaker” taking c. 1 month. The noise of this should be included in the chough SPA assessments together with the noise of drilling all the anchor pins for the J-tubes. We are concerned that this has been overlooked so far.	This will be included within the chough report MOR/RHDHV/DOC/0120
10	An assessment of potential impacts on cliff vegetation from the dust from drilling will be required.	The scale and difficulty of the work favours using lightweight drilling equipment that adopts air as the flushing medium. It will likely be percussive drilling methods that are used with air flush, which will produce dust. Although means of extracting or collecting dust are available this is normally associated with larger and not portable equipment. The larger equipment also tends to produce more dust. Percussive drilling will not be detrimental to the cliff face and should produce a neat round hole. It will probably produce dust and cuttings some of which may be blown away whilst some may fall by gravity rather like sand. It might be possible to implement some form of dust extraction arrangement, although this is likely to depend on the contractor carrying out the drilling. (See Section 5).
11	If any lubricant is required for the drilling then impacts of this must also be assessed.	The other main options for drilling fluid are water or air mist. Water would run down the face which is probably far less desirable than dust. Air mist introduces some water into the air to dampen the dust down but may have less benefit in this situation. Any other drilling fluids, such as bentonite or foam for example are less likely to be acceptable for the sea cliff environment. However, it is preferred that percussive drilling is adopted. (See Section 5).
12	There is no description about the nature of the pins but we suggest that they should be as durable as possible to minimise maintenance requirements and non-toxic to plants since there could be run-off from the pins downslope.	The items mentioned are referring to rock bolts, which are typically made of high yield steel although these could potentially be provided as stainless steel (but this would incur significant additional cost). It is expected that required maintenance would be minimal and further corrosion protection could be offered by wrapping the bolts, however this is expected to be low risk. (See Section 5).

Comment Number	Comment Detail	Morlais Response
13	Neutral grassland at the top of the cliff was mapped as heathland by CCW's phase 1 surveyors in the past. It may be a heath/grassland mosaic and, if so, restoration to heath rather than grassland would be preferred.	Following the NVC survey, NRW will be consulted to agree the habitats that will be restored at the cliff top. (See Section 6)
14	Para. 5.2.3 does not mention what will happen to the concrete mattress at sea level during decommissioning.	The decommissioning method is most likely to be a reverse of the installation method and include a mix of carefully managed work from the foreshore, from inshore vessels and by divers. The sea mattress will be inspected to assess structural integrity at the beginning of decommissioning and the method details adapted based on their condition, for example, if a portion was considered more, or less, likely to break-up upon removal. (See Section 5).
15	Any replanting should comprise species suitable to the area, particularly near the boundary of the SAC.	Any replanting will comprise species suitable to the area, particularly near the boundary of the SAC. (See Section 6)
16	Storage of soil: It is not only important to keep topsoil and subsoil separate, topsoil from unimproved or semi-improved areas should be separate from improved topsoil.	Topsoil from unimproved or semi-improved areas will be kept separate from improved topsoil. (See Section 5).
17	Para. 6.2.2: Seeds should be collected in late summer. In some areas it may be preferable to reseed using material "Rytecced" from local heathland	Reseeding will be agreed in advance with NRW (See Section 6)
18	Para. 6.3.2, Mitigation: Under the secondary option, i.e. trenching, beyond the measures already made to avoid and minimise direct impacts upon the SAC/SSSI features through micro-siting, reduction of footprint and adaptation of methods to be used during construction, no further mitigation is considered to be successful upon the sea cliff habitat due to ongoing disturbance through 5 yearly maintenance activities. Please also clarify the purpose of the highlighted section.	This section states that mitigation has already been implemented, in the form of micro-siting, reduction of footprint and adaptation of methodology. A potential Biodiversity Net Gain Initiative is discussed under residual impact and in Section 8.
19	We would seek clarity over the reasons why Option A has been selected over Options B and C, as from Figure 1 it appears that a larger area of vegetated vertical sea cliff would be affected compared to Option C and to a lesser extent Option B. We would value seeing the process and reasons as to why Options B and C have been ruled out.	The project engineers (Black & Veatch) determined that Option A has the greatest stability for allowing the engineering of pinning the cables to cliff. Options B and C were discounted prior to application due to significant areas of fractured rockface (B) and access restrictions for construction machinery / proximity to only public right of way to beach (C). Both Options B and C would also require impacting a larger section of cliff and vegetation than Option A. A is the most stable area for pinning the cables to.

Comment Number	Comment Detail	Morlais Response
20	It is difficult to anticipate what the effects of the J- tubes 400mm from the cliff will be. During installation we would expect almost all vegetation within the working zone to be damaged, but roots may persist and may regrow. We will have a better idea about how fragile the vegetation is after the survey.	Assessment assumes worst case of all being removed for the life of the project (>40yrs), although the methodology proposed has been designed to minimise loss of vegetation if at all possible. (See Sections 5 and 6).
21	During operation there will be a shading effect and possibly sheltering effect. This could lead to the growth of different plants, not normally part of the vegetated sea cliff community. Whatever the effects, they will last for the duration of the project i.e. 37 years.	This is included within the assessment (See Section 6)
22	We cannot accept the assertion that damaging a 7m wide strip of cliff is “de minimis”. If an area of any SSSI of these dimensions were deliberately damaged without consent, we would consider it as a potential offence. We therefore advise that the final assessment of the impact of the proposals should be changed.	We do not consider the proposed project to cause a significantly adverse impact on the SSSI or an adverse effect on the integrity (AEOI) on the basis it is a small-scale impact with no change to the form and function of the designated features of the SAC. This is further discussed in Section 6 and 9
23	We are currently unable to determine if there would be any permanent loss of Vegetated Sea Cliff (Annex I habitat) as a result of trenching at landfall. The construction methodology outlining the cliff works does not clearly outline how the siting of the cables via J-tubes will interact with the existing vertical cliff vegetation and whether or not after the installation the Vegetated Sea Cliff (Annex I habitat) would be permanently damaged or destroyed from: 1. shading 2. a reduced influence of salt-spray on vegetation 3. the loss of epithilic lichens 4. the loss of disturbance by sea birds (essential for ephemeral sea cliff plant species.	We have assessed on the worst case that the vegetation will be impacted within the entire footprint (7m wide cable chute and 2m either side) for the duration of the project but is anticipated to recover over time following decommissioning of the cables and associated infrastructure on the cliffs. These points have been clarified in Section 6.3.2

5 Overview of refinements made to the project envelope

This section outlines the refinements made to the project envelope. All changes lie within the existing Order limits.

Under both options, it is anticipated that the main construction compounds and welfare facilities will be located adjacent to the Landfall and Orthios substation sites. It is proposed that all satellite compounds are adopted for the storage of materials and small tools necessary for the day's activities.

All compounds will be established in accordance with the level of exposure to the environment and the anticipated weather conditions. For example, welfare facilities can be provided via welfare (e.g. Garic) van which can be readily removed from site at night or if weather conditions worsen. All compounds are to be secured via perimeter fencing which will be appropriate to the prevailing conditions (e.g. storm proofing).

For the construction phase of the project, a detailed Materials Management Plan will be developed by the contractor and submitted for acceptance by the client. All construction works will be programmed and undertaken to meet any planning and environmental constraints that are imposed by the works. It is however anticipated that the works will be phased to minimise environmental impact and disruption to local receptors. Construction of the works will be phased to suit available land take (e.g. stockpile and laydown areas) which will accommodate the temporary storage of turf as required.

5.1 Preferred Option: HDD at landfall

The designation of the SAC (and SSSI) includes 'Vegetated sea cliffs of the Atlantic and Baltic Coasts', and this habitat follows the coastline of Holy Island. The preferred option for crossing the cliffs is by Horizontal Directional Drilling (HDD), which avoids all direct impacts on the sensitive coastal habitats.

Under the preferred option, the transition pits from where the HDD would take place will be set back from the cliffs and the designated site by 220m, with all landfall substation related infrastructure, including stock piles, also set back by that distance or more. The HDD Methodology is presented in Chapter 4 Project Description of the ES.

5.2 Secondary Option: trenching at landfall

Should HDD not be possible at the landfall, a secondary option is included within the design envelope, which would incorporate trenching the cables across fields and pinning them down the cliffs. This option was presented in the ES and will only be deployed if the preferred HDD method is not achievable for engineering reasons. After feedback from NRW and RSPB, engineering approaches have been considered in more detail and considerable additional mitigation through design can be confirmed. Consideration has been made to refine the design and reduce potential impacts within the designated site and the designated features where possible through the following measures:

- **Micrositing**: The location of landfall has now been identified to be within a very narrow band of the SAC to minimise the footprint on the designated habitat. At this location, the SAC is limited to the cliff face and does not include the grassland at the top of the cliff.
- **Avoidance**: The width of the working corridor has been considered and reduced upon sensitive habitats where possible, including a reduction of the working corridor within the SAC itself from 30m with up to 30m working width either side (a total of 90m wide potential impact width), to 7m with 2m working width either side (a total of 11m wide potential impact width). This is a reduction of 88% on the original project footprint assessed in the ES. All wet and dry heath habitat has also

already been avoided in the creation of the original Onshore Development Area presented in the ES.

- **Methodology**: Previous methodology included the option for slots to be cut into the cliff-face, in which the J-tubes would be inserted. To minimise damage to the SAC, it is now proposed to drill the J-tubes to the cliff using bolt anchors, allowing the J-tubes to sit approximately 400mm away from the face of the cliff.

Drawings 1 and 2 also provide further details on the route of the cable line and the design and layout of the preferred and secondary options for landfall at the cliff.

Further details on methodology for construction, maintenance and decommissioning at the cliffs is presented in the following sections.

5.2.1 Construction methodology

Trenching from transition pits to cliff side draw pits

This section should be read alongside **Drawing 2: 122938-BVL-Z0-00-DR-Z-00003** which is appended at the end of this note.

From the substation, nine cable ducts of 350mm outside diameter will be trenched within in a c.28m wide corridor to a series of nine draw pits set back from the cliff edge and outside the boundary of the SAC. A minimum working width of 2m either side of the trench corridor is required to enable machinery and operatives to safely access the trenches making a total minimum working corridor width of c.32m. Storage of turf (where practicable), topsoil and excavated material from the trench corridor will be in a designated stockpile area adjacent to the trench. The stockpile area will be in an area of poor semi-improved grassland, avoiding the un-improved neutral grassland. An Ecological Clerk of Works (ECoW) will work with the contractor to ensure work areas are microsited into the least sensitive habitat. There is a working area each side of the trench which incorporates the stockpile area and site compound. However, where the footprint is constrained there is an assumed 2m 'buffer' each side of the trench whereby the majority of the vehicle/plant movements will be on the reinstated trench (i.e. trench installed in sections). The stockpile area will be set back by a minimum of 19.5m from the sensitive coastal habitat. As with all embankments, due consideration will be given to pluvial runoff and suitable protection measures put in place. Any surface water drainage discharge will be in agreement with the landowner or governing authority. The type of and extent of protection provided will be in accordance with usual construction practises and standards.

Works within un-improved neutral grassland will be minimised (in both footprint and duration) where possible and will be prioritised in areas of improved / semi-improved grassland. The cables can be installed in the trenches in sections. Once the cables have been installed, the sections will be back filled, and the top soil / turf replaced as soon as practicable to reduce the time turf is stored for. Long-term (more than a month) storage of topsoil in bunds or heaps will be avoided where possible and will be positioned on improved grassland.

Protective matting (such as grass protection mesh, e.g. https://www.grassmats.co.uk/product/grass-protection-mesh/) would be used on the grassland habitat to reduce compaction impacts in the working corridor. The main cable trenching works are not located within the unimproved neutral grassland. No matting will be stored on the un-improved neutral grassland unnecessarily (for example when not in use) to minimise impacts to the neutral grassland and no equipment or excavated soil will be stored on the un-improved neutral grassland.

Due to the likely presence of rock, it is anticipated that the trenches (and draw pit excavations) will be dug by 30Tonne tracked excavator with a 'breaker' attachment and may take approximately 1 month to complete (best assumption, subject to production rates). Noise impacts associated with this equipment are discussed in note MOR/RHDHV/DOC/0120.

Cliff works

This section should be read alongside **Drawing 1: 122938-BVL-Z0-00-DR-C-00600.P02-S2** which is appended at the end of this note.

From the draw pits, the cable ducts will be marshalled closer together on approach to a structural steel cable chute positioned at the edge of the cliff. This length of cabling is anticipated to be installed using similar excavation equipment as per the main cable trenching works with the 32m working maintained to provide flexibility to complete the cliff side pinning works. Storage of turf (where practicable), top soil and excavated material will adopt the stockpile area used for the main trenching works which is in an area of Low Sensitive Habitat. The total excavated area of the cable trench between the draw pits and cable chute is c.191m^2 and will take approximately 1 week to complete (subject to production rates).

To facilitate the bending radius of the export cables as they pass over the cliff edge, it is proposed that a steel cable chute will be positioned at the top of the cliff. This chute is a structure c.7.5m wide that could be secured directly by several rock bolts at ground level. This element of the design will be subject to further refinement through detailed design phase post consent. However, as presented below the design represents the worst case.

The 9no. cables will exit the cable chute into 9no. J-tubes that will be attached directly to the cliff face and will pass through the SAC. The J-tube corridor will be c.7.15m wide down the cliff face (9 x 350mm J-Tube OD) + (8 x 500mm spacing) + (2 x 100mm end collars) = 7.35m at the collars. The width between the actual J-Tubes is 7.15m). Construction of the cables and pinning to the cliff will be via a top-down approach, using a specialist rope-access contractor to install and pin the J-tubes using manually operated drilling rigs. Personnel and the drilling rig may work directly on the cliff face or conduct the works off a suspended platform lowered from a crane (such as a mobile 60Tonne crane) located at the cliff edge, although the methodology is to be confirmed. This approach will ensure that the footprint of construction works on the cliff face remains as small as practicable and will require an additional 2m working width either side of the J-tube corridor where potential scuffing of the cliff face and associated vegetation may occur. The construction corridor on the cliff (and therefore within the SAC) will be c.11.15m wide and c.510m^2. The 32m working corridor adopted for the trenching works will be maintained at the top of the cliff to provide the necessary room to support the cliff pinning works which will probably take around 2 weeks to complete. Protective grass matting will be used to protect the unimproved neutral grassland habitat at the top of the cliff. Where practicable, equipment or matting will not be stored on the neutral grassland unnecessarily (for example, when not in use, noting it may not be practical to move the crane on a daily basis) to minimise impacts to the unimproved neutral grassland. It is expected that each pin will be grouted into place which will require provisions for the management of grout spillage, measures of which will be detailed within the final CoCP and PPMP. Alternatively, mechanical bolt anchorages may be adopted. The rock bolts are typically made of high yield steel although these could potentially be provided as stainless steel (but this would incur significant additional cost). It is expected that required maintenance would be minimal and further corrosion protection could be offered by wrapping the bolts, however this is expected to be low risk.

On the cliff face, the J-tubes will be pinned using thread bar rock anchors (between 25 and 32mm diameter) currently expected to be set deep (3m embedment) into the rock and at 4m vertical spacings (along the incline of the rock). Adjacent J-tubes will be placed at 500mm clear distances and are anticipated to have

an outer diameter of 350mm. It is currently assumed that each J-tube will be attached to the cliff individually which would require c.100 anchors in total. Further design development may identify the use of saddles/brackets to group adjacent J-tubes which could reduce the number of rock anchors to, for example, c.50 anchors.

The thread bar anchors will protrude from the cliff face by approximately 400mm to allow the J-tubes to be separated from the cliff face to minimise impacts to the cliffs and associated vegetation.

At the toe of the cliff, the J-tubes will be installed using rock bolt anchors drilled into the foreshore. Concrete protection mattresses (or rock bags) will be used to protect the J-tubes and will be placed up to level of highest astronomical tide (HAT). Some 7m^2 of this will extend into the intertidal 'Maritime & Cliff' zone of the SAC which includes the vegetated sea cliffs. The SAC continues to Mean Low Water Springs (MLWS). intertidal section of the SAC, characterised as intertidal mud / sand, is not included within this calculation as it is not a designated feature of the SAC. The area of potential works associated with export cable routes (including any concrete curtains) from the upper intertidal across the supralittoral (splash zone) do not interact with any of the notified habitats or species of the Glannau Ynys Gybi / Holy Island Coast SSSI as there are no marine (intertidal) notified features listed for the Glannau Ynys Gybi / Holy Island Coast SSSI. Glannau Ynys Gybi SSSI has other habitats/earth science features that contribute to the special interest, including rockpools, overhanging rock, gullies and under boulder communities and their associated flora and fauna. These are key components of the special interest of the site and therefore will be avoided where possible, however there is not statutory mechanism by which they are protected within the SSSI.

The scale and difficulty of the work favours using lightweight drilling equipment that adopts air as the flushing medium. It will likely be percussive drilling methods that are used with air flush, which will produce dust. Although means of extracting or collecting dust are available this is normally associated with larger and not portable equipment. The larger equipment also tends to produce more dust.

Percussive drilling will not be detrimental to the cliff face and should produce a neat round hole. It will probably produce dust and cuttings some of which may be blown away whilst some may fall by gravity rather like sand. It might be possible to implement some form of dust extraction arrangement, although this is likely to depend on the contractor carrying out the drilling.

The other main options for drilling fluid are water or air mist. Water would run down the face which is probably far less desirable than dust. Air mist introduces some water into the air to dampen the dust down but may have less benefit in this situation. Any other drilling fluids, such as bentonite or foam for example are less likely to be acceptable for the sea cliff environment. However, it is preferred that percussive drilling is adopted.

The rock bolts are typically made of high yield steel although these could potentially be provided as stainless steel (but this would incur significant additional cost). It is expected that required maintenance would be minimal and further corrosion protection could be offered by wrapping the bolts, however this is expected to be low risk.

5.2.2 Maintenance methodology

Maintenance of the cables will be undertaken by pulling them back through the J-tubes to the draw pits near the cliff edge. Access is therefore not required within the SAC for cable maintenance, with works completed within the grasslands at the top of the cliff.

The thread bar anchors penetrate 3m into the rock and will provide support the rock face of the cliff. Any maintenance of the J-tubes within the SAC is considered to be infrequent. In the unlikely event maintenance is required on the cliff face (i.e. within the SAC) the approach would be similar to construction, i.e. using a crane at the top of the cliff to support a lowered platform. As a worst case, the footprints and dimensions would be the same as per construction however realistically it is not anticipated the whole footprint would be fully impacted in each maintenance regime. It is likely that inspections of the J-Tubes would take place every 5 years and following severe storm events.

5.2.3 Decommissioning methodology

Cables will be removed from the cable ducts. The cable ducts will remain in-situ where buried either under the road or verge, but the J-tubes will be removed where surface laid on the cliffs at landfall. Upon decommissioning, the J-tubes will be removed from the cliff. This will entail similar methodology and footprints used during construction, working in reverse. The thread bar anchors will be cut off at the cliff face, with the embedded anchor left in situ to minimise disturbance to the cliff.

The cable chute (and concrete pad foundations) will be recovered during decommissioning. Ground anchors to the cable will be cut off at the foundation formation level. Chambers covers to the draw pits will be removed and the voids backfilled and covered with topsoil and turf.

The decommissioning method for the concrete matting is most likely to be a reverse of the installation method and include a mix of carefully managed work from the foreshore, from inshore vessels and by divers. The sea mattress will be inspected to assess structural integrity at the beginning of decommissioning and the method details adapted based on their condition, for example, if a portion was considered more, or less, likely to break-up upon removal.

6 Potential Impacts

The updated impacted assessments that have been undertaken focus on the highly sensitive features of the Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC and neutral grassland at the top of the cliff, in response to the comments and clarifications received by NRW. The assessments in the following sections update the impact assessments made in the ES following the design refinement described above.

The assessment considers potential impacts from:

- the preferred option of HDD at landfall; and
- the secondary option of trenching at landfall.

6.1 Construction impacts to Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC

6.1.1 Preferred Option: HDD at landfall

Direct impacts

The preferred option of bringing the cables ashore at landfall is to use HDD (see Chapter 4, Project Description of the ES). This method will avoid any interaction with the intertidal environment, vegetated sea cliffs and coastal fringe habitat, and would be located within the grasslands that are set further back from the coast (Figure 19.6, Volume II of the ES). The HDD entry and exit pits will be set back a minimum of 220m from sensitive coastal habitats. The use of HDD at landfall will entirely avoid the designated site

and its qualifying features, and the habitat and species for which it is afforded protection, and consequently there will be **no direct impact** on the SAC/SSSI or its designated features.

Mitigation
None required

Residual Impact
There will remain to be **no direct impact**

Indirect impacts

There is potential for indirect impacts to occur should run-off of sediments occur from the construction footprint, including stockpiles of excavated material during the HDD activities, and contaminate or smother highly sensitive maritime grassland and cliff habitats at the coast. Impacts associated with run off are considered to be of up to negligible magnitude with effects occurring in the long term due to poor rates of recovery of sensitive habitats in stressful environmental conditions at the coast. This is anticipated to be of **minor adverse significance**, depending in the amount of habitat affected. Additional mitigation measures are discussed below.

Additional Mitigation
Control of sediment supply
Measures contained within the CoCP and the PPMP will be designed to limit the potential for dispersal and accidental releases of potential contaminants, soil derived dusts and uncontrolled run-off to occur during construction. The CoCP and the PPMP would be developed for the construction activities which will adhere to all relevant legislation and industry good practice guidance as detailed in NRW's series of Sector Guidance Notes (SNG) and Technical Guidance Notes (TNG) to advise operators on standards for operational and environmental performance. There are regularly updated, and a list will be compiled prior to commencement of construction to ensure currency of advice. Areas covered by the notes will include:

- Guidance for storage and handling of materials,
- Guidance for site drainage and effluent management; and
- Guidance on environmental best practice.

Good practice measures from the relevant guidance notes from NRW's Sector Guidance Notes (SNG) and Technical Guidance Notes (TNG) will be adopted and implemented as agreed with NRW. In addition, relevant good practise from the Construction Industry Research and Information Association (CIRIA)'s 'Control of water pollution from construction sites: Guidance for consultants and contractors (C532)' (2001) will also be implemented with agreement from NRW.

The CoCP and the PPMP will include the following:

- Subsoil exposure would be minimised, and strips of undisturbed vegetation would be retained on the edge of the working area where possible;
- On-site retention of sediment would be maximised by routing all drainage through the site drainage system;
- The drainage system would include measures to intercept sediment runoff at source. Suitable filters would be used to remove sediment from any water discharged into the surface drainage network;
- Additional measures would be included in parts of the working area that are in proximity to surface drainage channels;

- Soil and sediment accumulation on road surfaces would be minimised as reasonably practicable by cleaning the wheels of vehicles leaving site and, where required, clearance of the road surface. Traffic movement would be restricted to minimise the potential for surface disturbance;
- The works area would aim to avoid water resources and flood risk receptors wherever possible.
- The CoCP and the PPMP will set out how material is to be excavated and stockpiled to minimise the potential for run-off, soil degradation or wind dispersal of dusts, including consideration of local natural drainage to enable the precise location of stockpile material to drain into local natural soil drainage system;
- The covering of long-term stockpiles with sheeting or the binding of the surface through temporary grass seeding will be specified together with dampening procedures during dry weather.
- In the event of uncontrolled releases occurring, the CoCP and the PPMP would set out the measures required of the construction contractor to ensure that the extent and impact of any such releases are contained and ultimately remediated.
- Construction materials and spoil materials will be positioned in a manner that does not constrain potential flood waters unduly or direct flood waters towards habitats of high sensitivity.
- Construction will not be undertaken during very extreme wet weather where erosion of sediments and risk from flooding may increase.
- The avoidance of soil compaction through the use of Low Ground Pressure (LGP) tracked or wheeled tyres to spread the weight of vehicles, limiting the height of soil stockpile mounds, restricting construction traffic to specific areas on the construction working width.

Further details on mitigation for release of contaminants is provided in Chapter 18 Ground Conditions and Contamination of the Morlais ES.

Soil management Plan

Under the final CoCP a Soil Management Plan (SMP) would be produced by a competent soil science contractor and agreed with the IoACC (and NRW as applicable), in advance of the works. The SMP would be completed pre-construction once an earthworks contractor has been appointed and detailed earthworks phasing information is available. The contractor would be required to comply with the SMP. The SMP will include, but not be limited to, the following measures:

- The separate storage of topsoil and excavated materials, to prevent mixing of subsoil and topsoil, thus improving reinstatement;
- Topsoil from unimproved or semi-improved areas will be kept separate from improved topsoil;
- Minimising excavation volumes and disturbance to the surrounding areas, together with the replacement of any soils inadvertently disturbed during excavations in general accordance with their original structure and location;
- Protocols for works in wet weather to minimise accumulation of mud within the working corridor and runoff into the SAC / unimproved neutral grassland; and
- The setting of vehicular speeds along the construction access routes to minimise soil compaction.
- Any stockpiles of excavated material shall be covered, seeded or fenced to prevent wind whipping or wind/water erosion.
- Where surface vegetation has been removed, this will be reseeded to prevent future runoff.
- This plan will be developed with the relevant stakeholders and should be complimentary to other proposed mitigation measures

Residual impact

Following implementation of the mitigation measures to protect stockpiles and other areas of the construction site from run-off impacting upon the sensitive coastal habitats, including the designated site, the potential indirect impacts associated with run-off will be negligible in significance.

6.1.2 Secondary Option: trenching at landfall

Direct impacts

Under a worst-case scenario where HDD at landfall is not possible for technical / engineering reasons, landfall activities will involve trenching the cabling through a narrow coastal strip of the Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC designation and associated cliff habitat. Details of the activities and methods used within the SAC/SSSI are detailed in Section 5.2.

Areas of long term (i.e. for the life of the project and the recovery of the vegetation) and temporary direct impacts to the SAC cliff features are detailed in **Table 6.1**. A total of 510 m^2 of the designated features of the SAC/SSSI would be impacted, which is a large reduction from that considered in the original assessment, which considered up to 31,700 m^2 of the designated site to be disturbed / permanently impacted.

Table 6.1 Areas of designated habitat effected within the SAC

Impact type	Activity	Area (m^2)
long term (life of project+ recovery) loss (m^2)	Corridor of J-tubes 7.15m wide (7.35m at the collars) and c.45m along the cliff incline, including 50-100 thread bar rock anchors (including 36.5m2 for concrete mattress protectors at the toe of the cliff)	330
Temporary loss (m^2)	Two working corridors for installation where scuffing of the cliff face may occur, each 2m wide each side of the 7.15m wide J-Tube corridor and c.45m along the cliff incline	180
Total area of SAC impacted (m^2)		510 Of which: Neutral grassland– 162m^2 Cliff/Maritime – 341m^2 Intertidal habitat – 7m^2
Total footprint of SAC (m^2)		43,600,000
Total footprint of Vegetated sea cliffs of the Atlantic (and Baltic) Coasts recorded within the SAC (m^2)		1,105,900
% of Vegetated sea cliffs of the Atlantic (and Baltic) Coasts feature (i.e. life of project plus recovery of vegetation) affected in the long term		0.029%
% of Vegetated sea cliffs of the Atlantic (and Baltic) Coasts feature affected in temporary working corridor		0.016%
Total % of Vegetated sea cliffs of the Atlantic (and Baltic) Coasts effected		**0.046%**

The amended methodology to pin the cables to the cliff (see Section 5.2.1 for details) rather than create slots for J-tubes to be inserted into, is designed to minimise the impacts to the cliff face and associated vegetation. The footprint of temporary habitat disturbance on the cliff due to scuffing during installation will be up to 2m either side of the J-tube corridor. The worst-case assessment assumes habitat loss would occur in the entire corridor however, because the J-tubes would be installed manually, there may be large

areas of vegetation, or roots which may persist and grow, retained within the working corridor and that the scuffing does not strip the entire temporary working corridor of vegetation and therefore the realistic scenario is likely to be less adverse. As maintenance activities are estimated to occur every five years, and habitat recovery is likely to be more than 5 years for vegetated sea cliff habitats, it is therefore considered, taking a precautionary approach, that this would be a long term impact upon the cliffs within the full 510m^2 of the cliff feature affected within the SAC/SSSI, with maintenance occurring before vegetation is fully recovered. This impact would be reversable upon decommissioning, however this is likely to be in excess of 40 years. It is worth noting that the sea cliffs along the Holy Island coast do occasionally collapse, which may interfere with the vegetation established upon it, however the condition of the cliffs, or their friability is currently unknown within the Onshore Development Area. The thread bar anchors would be installed deep enough to contribute to the stabilising of the cliffs behind the J-tubes.

Impacts of dust from drilling activities are likely to be low in magnitude, due to the lightweight drilling equipment that would be used. The main options for drilling fluid are water or air mist which would be of negligible magnitude on the vegetation on the cliff.

All wet and dry heath designated habitat has already been avoided in the design of the Onshore Development Area. The magnitude of impact upon the vegetated cliff habitat is assessed to be of near negligible magnitude, affecting 0.05% of the friable cliff habitat. Our analysis suggests a worst case maximum 0.046% of designated feature is anticipated to be directly impacted in the long term (i.e. for the life of the project plus recovery) lost. It is likely that the actual area affected by installation will be less than the 0.046% worst case loss as habitat lost through installation and maintenance will be minimised. Overall, the impact is anticipated to be **minor adverse** in significance, which is not significant in EIA terms.

Additional Mitigation

Under the secondary option, i.e. open cut trenching and pinning the J tubes to the cliff face, beyond the measures already made to avoid and minimise direct impacts upon the SAC/SSSI features through micro siting, reduction of footprint and adaptation of methods to be used during construction, no further mitigation is considered to be successful upon the sea cliff habitat due to ongoing disturbance through 5 yearly maintenance activities.

Preconstruction survey

Prior to construction, further detailed botanical survey work will be undertaken to record the presence and extent of spatulate (South Stack) fleawort, golden-hair lichen and spotted rock-rose (and other areas of botanically rich vegetation) so that minimal impacts to these species and their associated habitats can be experienced. Such survey work should be carried out in May or June when fleawort is in flower to aid with micrositing activities. The design of the survey will be undertaken in consultation with the IoACC and NRW and will take the form of a Phase II National Vegetation Classification Survey (by NRW approved contractors with relevant qualifications and experience in surveying cliff face vegetation) and will extend at least 20m from the cliff top inland and finish at break of slope on the seaward side. Fixed point photographs will be used as part of the survey procedure. Survey on the cliff may be undertaken by drone, supplemented by a roped-access botanical survey by suitably-qualified botanist to allow for identification of small specimens of rare plants. This will also include photography of the cliff face to provide an understanding of density of the plant growth. The survey will provide greater clarity on the type of vegetation that might be impacted, and its fragility.

Residual Impact

The impact to the designated feature of the SAC/SSSI therefore remains **minor adverse** in significance during construction, operation and decommissioning phases. Works to undertake biodiversity net gain will be reliant upon further survey and consultation with IoACC and NRW

Indirect impacts

There is potential for indirect impacts should run-off of sediments occur from the construction footprint, including stockpiles of excavated material during the trenching activities, and contaminate or smother highly sensitive maritime grassland and cliff habitats at the coast. Impacts associated with surface water run-off are considered to be of up to negligible magnitude with effects occurring in the long term due to poor rates of recovery of sensitive habitats in stressful environmental conditions at the coast. This is anticipated to be of up to **minor adverse** significance, depending in the amount of habitat affected. Additional mitigation measures are discussed below.

A water resources assessment has been undertaken and is presented in Chapter 17, Water Resources and Flood Risk of the ES. The assessment concluded no significant impacts. There is no hydrological connection to the protected sites in terms of surface water, and the excavations are shallow enough to have no significant impact on groundwater flow. As such, there is not anticipated to be any hydrological impacts which may affect the habitats, species or designated features of the designated sites.

Air quality impacts on designated ecological sites are considered in Chapter 22, Air Quality of the ES. Impacts on designated sites relating to construction phase dust and particulate matter emissions were considered. Risk of dust impacts to ecological receptors, including the designated sites, were assessed to be high during earthworks, low during construction activities and medium from track out from Heavy Goods Vehicles (HGV) movements. With the implementation of the recommended mitigation measures, i.e. adherence to best practice dust minimisation and suppression methods as recommended by the Institute of Air Quality Management (IAQM), including creation of a Dust Management Plan (DMP), impacts to ecological receptors are considered to be not significant. There are not anticipated to be any significant impacts on designated sites associated with road traffic emissions due to the expected low number of vehicle movements in the construction, operational and decommissioning phases.

Additional Mitigation measures

Control of sediment supply

Measures outlined within the CoCP and PPMP are designed to limit the potential for dispersal and accidental releases of potential contaminants, soil derived dusts and uncontrolled run-off to occur during construction. The CoCP and the PPMP would be developed for the construction activities which will adhere to all relevant legislation and industry good practice guidance as detailed in NRW's series of Sector Guidance Notes (SNG) and Technical Guidance Notes (TNG) to advise operators on standards for operational and environmental performance. There are regularly updated, and a list will be compiled prior to commencement of construction to ensure currency of advice. Areas covered by the notes will include:

- Guidance for storage and handling of materials,
- Guidance for site drainage and effluent management; and
- Guidance on environmental best practice.

Good practice measures from the relevant guidance notes from NRW's Sector Guidance Notes (SNG) and Technical Guidance Notes (TNG) will be adopted and implemented as agreed with NRW. In addition, relevant good practise from the Construction Industry Research and Information Association (CIRIA)'s 'Control of water pollution from construction sites: Guidance for consultants and contractors (C532)' (2001) will also be implemented with agreement from NRW.

The final CoCP and PPMP and include the following:

- Subsoil exposure would be minimised, and strips of undisturbed vegetation would be retained on the edge of the working area where possible;
- On-site retention of sediment would be maximised by routing all drainage through the site drainage system;
- The drainage system would include measures to intercept sediment runoff at source. Suitable filters would be used to remove sediment from any water discharged into the surface drainage network;
- Additional measures would be included in parts of the working area that are in proximity to surface drainage channels;
- Soil and sediment accumulation on road surfaces would be minimised as reasonably practicable by cleaning the wheels of vehicles leaving site and, where required, clearance of the road surface. Traffic movement would be restricted to minimise the potential for surface disturbance;
- The works area would aim to avoid water resources and flood risk receptors wherever possible.
- The CMS will set out how material is to be excavated and stockpiled to minimise the potential for run-off, soil degradation or wind dispersal of dusts, including consideration of local natural drainage to enable the precise location of stockpile material to drain into local natural soil drainage system;
- The covering of long-term stockpiles with sheeting or the binding of the surface through temporary grass seeding will be specified together with dampening procedures during dry weather.
- In the event of uncontrolled releases occurring, the CMS and the Contractor's own method statements contained in their Construction Phase Plan (CPP) would also set out the measures required to ensure that the extent and impact of any such releases are contained and ultimately remediated.
- Construction materials and spoil materials will be positioned in a manner that does not constrain potential flood waters unduly or direct flood waters towards habitats of high sensitivity.
- Construction will not be undertaken during very extreme wet weather where erosion of sediments and risk from flooding may increase.
- The avoidance of soil compaction through the use of Low Ground Pressure (LGP) tracked or wheeled tyres to spread the weight of vehicles, limiting the height of soil stockpile mounds, restricting construction traffic to specific areas on the construction working width.

Further details on mitigation for release of contaminants is provided in Chapter 18 Ground Conditions and Contamination of the Morlais ES.

Soil management Plan

Under the CoCP a SMP would be produced by a competent soil science contractor and agreed with the IoACC (and NRW as applicable), in advance of the works. This would be completed pre-construction once an earthworks contractor has been appointed and detailed earthworks phasing information is available. The contractor would be required to comply with the SMP. The SMP will include, but not be limited to, the following measures:

- The separate storage of topsoil and excavated materials, to prevent mixing of subsoil and topsoil, thus improving reinstatement;
- Topsoil from unimproved or semi-improved areas will be kept separate from improved topsoil;
- Minimising excavation volumes and disturbance to the surrounding areas, together with the replacement of any soils inadvertently disturbed during excavations in general accordance with their original structure and location;
- Protocols for works in wet weather to minimise accumulation of mud within the working corridor and runoff into the SAC / unimproved neutral grassland; and
- The setting of vehicular speeds along the construction access routes to minimise soil compaction.

- Any stockpiles of excavated material shall be covered, seeded or fenced to prevent wind whipping or wind/water erosion.
- Where surface vegetation has been removed, this will be reseeded to prevent future runoff.
- This plan will be developed with the relevant stakeholders and should be complimentary to other proposed mitigation measures

Residual impact
Following implementation of the mitigation measures to protect stockpiles and other areas of the construction site from run-off impacting upon the sensitive coastal habitats, including the designated site, the potential indirect impacts associated with run-off are reduced to **negligible** in significance

6.2 Potential construction impacts on sensitive grasslands outwith the boundary of the Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC

6.2.1 Preferred Option: HDD at landfall

Direct impacts

Under the preferred option of HDD at landfall, there will be **no direct impacts** to the sensitive grasslands at the coast.

Mitigation
None required

Residual Impact
There will remain to be **no direct impact**.

Indirect impacts

There is potential for indirect impacts to occur should run-off of sediments occur from the construction footprint, including stockpiles of excavated material during the HDD activities, and contaminate or smother highly sensitive maritime grassland at the coast. Impacts associated with run off are considered to be of up to negligible magnitude with effects occurring in the long term due to poor rates of recovery of sensitive habitats in stressful environmental conditions at the coast. This is anticipated to be of up to **minor adverse significance**, depending in the amount of habitat affected.

A water resources assessment has been undertaken and is presented in Chapter 17, Water Resources and Flood Risk of the Morlais ES. The assessment concluded no significant impacts. There is no hydrological connection to the protected sites in terms of surface water, and the excavations are shallow enough to have no significant impact on groundwater flow. As such, there is not anticipated to be any hydrological impacts which may affect the habitats or species at the coast.

Air quality impacts on designated ecological sites are considered in Chapter 22, Air Quality of the Morlais ES. Impacts on designated sites relating to construction phase dust and particulate matter emissions were considered. Risk of dust impacts to ecological receptors, including the designated sites, were assessed to be high during earthworks, low during construction activities and medium from track out from Heavy Goods Vehicles (HGV) movements. With the implementation of the recommended mitigation measures, i.e. adherence to best practice dust minimisation and suppression methods as recommended by the Institute of Air Quality Management (IAQM), including creation of a Dust Management Plan (DMP), impacts to

ecological receptors are considered to be not significant. There are not anticipated to be any significant impacts on sensitive habitats associated with road traffic emissions due to the expected low number of vehicle movements in the construction, operational and decommissioning phases.

Additional Mitigation measures

Control of sediment supply

Measures contained within the CoCP and the PPMP will be designed to limit the potential for dispersal and accidental releases of potential contaminants, soil derived dusts and uncontrolled run-off to occur during construction. The CoCP and the PPMP would be developed for the construction activities which will adhere to all relevant legislation and industry good practice guidance as detailed in NRW's series of Sector Guidance Notes (SNG) and Technical Guidance Notes (TNG) to advise operators on standards for operational and environmental performance. There are regularly updated, and a list will be compiled prior to commencement of construction to ensure currency of advice. Areas covered by the notes will include:

- Guidance for storage and handling of materials,
- Guidance for site drainage and effluent management; and
- Guidance on environmental best practice.

Good practice measures from the Construction Industry Research and Information Association (CIRIA)'s 'Control of water pollution from construction sites: Guidance for consultants and contractors (C532)' (2001) will also be implemented with agreement from NRW.

The PPMP will include the following:

- Subsoil exposure would be minimised, and strips of undisturbed vegetation would be retained on the edge of the working area where possible;
- On-site retention of sediment would be maximised by routing all drainage through the site drainage system;
- The drainage system would include measures to intercept sediment runoff at source. Suitable filters would be used to remove sediment from any water discharged into the surface drainage network;
- Additional measures would be included in parts of the working area that are in proximity to surface drainage channels;
- Soil and sediment accumulation on road surfaces would be minimised as reasonably practicable by cleaning the wheels of vehicles leaving site and, where required, clearance of the road surface. Traffic movement would be restricted to minimise the potential for surface disturbance;
- The works area would aim to avoid water resources and flood risk receptors wherever possible.
- The CMS will set out how material is to be excavated and stockpiled to minimise the potential for run-off, soil degradation or wind dispersal of dusts, including consideration of local natural drainage to enable the precise location of stockpile material to drain into local natural soil drainage system;
- The covering of long-term stockpiles with sheeting or the binding of the surface through temporary grass seeding will be specified together with dampening procedures during dry weather.
- In the event of uncontrolled releases occurring, the CMS and the Contractor's own method statements contained in their Construction Phase Plan (CPP) would also set out the measures required to ensure that the extent and impact of any such releases are contained and ultimately remediated.
- Construction materials and spoil materials will be positioned in a manner that does not constrain potential flood waters unduly or direct flood waters towards habitats of high sensitivity.
- Construction will not be undertaken during very extreme wet weather where erosion of sediments and risk from flooding may increase.

- The avoidance of soil compaction through the use of Low Ground Pressure (LGP) tracked or wheeled tyres to spread the weight of vehicles, limiting the height of soil stockpile mounds, restricting construction traffic to specific areas on the construction working width.

Soil management Plan
As part of the CoCP, a SMP would be produced by a competent soil science contractor and agreed with the IoACC (and NRW as applicable) This would be completed pre-construction once an earthworks contractor has been appointed and detailed earthworks phasing information is available. The contractor would be required to comply with the SMP. The SMP will include, but not be limited to, the following measures:

- The separate storage of topsoil and excavated materials, to prevent mixing of subsoil and topsoil, thus improving reinstatement;
- Topsoil from unimproved or semi-improved areas will be kept separate from improved topsoil;
- Minimising excavation volumes and disturbance to the surrounding areas, together with the replacement of any soils inadvertently disturbed during excavations in general accordance with their original structure and location;
- Protocols for works in wet weather to minimise accumulation of mud within the working corridor and runoff into the SAC / unimproved neutral grassland; and
- The setting of vehicular speeds along the construction access routes to minimise soil compaction.
- Any stockpiles of excavated material shall be covered, seeded or fenced to prevent wind whipping or wind/water erosion.
- Where surface vegetation has been removed, this will be reseeded to prevent future runoff.
- This plan will be developed with the relevant stakeholders and should be complimentary to other proposed mitigation measures

Residual impact
Following implementation of the mitigation measures to protect stockpiles and other areas of the construction site from run-off impacting upon the sensitive coastal habitats, including the sensitive grasslands, the potential indirect impacts associated with run-off are reduced to **negligible** in significance

6.2.2 Secondary Option: trenching at landfall

Direct impacts

This section (and associated calculated areas) focusses on the impacts to the coastal fringe habitats where the unimproved neutral grassland is located. It considers the works at the top of the cliff, as far as the landward face of the draw pits. It does not consider the trenching works inland from the draw-pits, which is considered within the ES.

Consideration has been made in the revised design of the proposed project to avoid the neutral unimproved grassland located at the top of the cliff where practicable.
Two out of the proposed nine draw-pits will be located within the unimproved neutral grassland, the other seven being located within the poor semi-improved grassland. It is proposed to leave all nine manhole covers in place, to reduce temporary disturbance to the habitat during planned or unplanned maintenance events. The footprint of the manhole covers, and the nine ground anchors will result in long term habitat loss for the life of the project as presented in Table 6.2, and will be reinstated upon decommissioning. There will be no laydown areas for plant or equipment within the neutral grassland habitat, recognising that this habitat is considered to be of high sensitivity.

Table 6.2 Areas of grassland potentially affected at the coast for secondary option of trenching at landfall

Impact type	Activity	Area (m^2)	Total (m^2)
Neutral unimproved grassland outside the SAC			
long term (i.e. for life of project plus recovery) habitat loss (m^2)	9no. ground anchors	n/a	1.65 plus 9 ground anchors
	2no. 900 x 900mm draw pit access manholes at the eastern end	1.65	
Temporary habitat loss(m^2)	draw pits corridor and marshalling area	39.45	262.95
	working corridor	223.5	
Poor semi-improved grassland outside the SAC			
long term (i.e. for life of project plus recovery) habitat loss (m^2)	7no, draw pit access manholes)	5.8	5.8
Temporary habitat loss (m^2)	Draw pits corridor and marshalling area	261.8	348.1
	working corridor	87.1	

Due to the small habitat loss of 1.65m^2 anticipated in the long term (for the life of the project plus recovery of vegetation) and reduced temporary disturbed footprint of unimproved neutral grassland at the coast of 262.95m^2, the magnitude of impact is assessed to be low. As such, the impacts to the neutral unimproved grassland at the coast are assessed to be **moderate adverse**, which is significant in EIA terms.

Additional Mitigation

Pre-construction survey

Prior to construction, further detailed botanical survey work will be undertaken to record the presence and extent of spatulate (South Stack) fleawort, golden-hair lichen and spotted rock-rose (and other areas of botanically rich vegetation) so that minimal impacts to these species and their associated habitats can be experienced. Such survey work should be carried out in May or June when fleawort is in flower to aid with micrositing activities. The design of the survey will be undertaken in consultation with the IoACC and NRW and will take the form of a Phase II National Vegetation Classification Survey (by NRW approved contractors with relevant qualifications and experience in surveying vertical cliff face vegetation) and will extend at least 20m from the cliff top inland and finish at break of slope on the seaward side. Fixed point photographs will be used as part of the survey procedure. Survey on the cliff may be undertaken by drone, supplemented by a roped-access botanical survey by suitably-qualified botanist to allow for identification of small specimens of rare plants. This will also include photography of the cliff face to provide an understanding of density of the plant growth.

Seed collection

Seed collection will be undertaken in late summer / autumn prior to construction from the areas of unimproved neutral grassland habitat. In some areas it may be preferable to reseed using “Rytecced” (heathers) from local heathland, as clifftop neutral grassland has been previously mapped as heathland by CCW’s Phase 1 surveyors (NRW, pers comm) and therefore the clifftop habitat may be a heath/neutral grassland mosaic. NRW have expressed preference to restore to heath in such case. Following the NVC survey, NRW will be consulted to agree the habitats that will be restored at the cliff top. All collected seeds will be suitably stored and used to aid habitat replacement on completion of the works and within the agreed areas. It is accepted that the seeds may not be successful in establishing. All replanting will comprise species suitable to the area, particularly near the boundary of the SAC. Monitoring of the replanted areas will be undertaken to understand the diversity that returns, and results will be provided to NRW.

Turf management Plan

A Turf Management Plan (TMP) will be created and included within the CoCP. Works to install the J-tubes on the cliffs have been designed to be undertaken manually to minimise the disturbance and removal of cliff vegetation, however the worst case assumes the disturbance / loss of all vegetation within the corridor of works on the cliffs. Re-turfing of the works within the SAC is considered to not be possible due to the steepness of the terrain and the fragility/thinness of associated soils. In addition, the stressful environmental conditions would reduce the likelihood of replaced vegetation establishing, and as monitoring is proposed to take place approximately every 5 years, there is potential for more disturbance to occur before the habitat has recovered. Therefore, no habitat replacement is proposed upon the cliffs within the SAC.

Soil depths at the top of the cliff are currently unknown but are considered to be shallow. The success of a turf management regime is therefore currently unknown, however if it is practicable to do so, the following turf management will be implemented.

Turf removed at the top of the cliff will be carefully managed to allow for reinstatement upon completion of the works. This will include the following measures:

- Stripped turfs will be stored (labelled) within the stockpiling areas 'vegetation or turf side up' with adequate growing conditions e.g. water (including during dry or windy conditions), light and temperature;
- Turves will be protected through temporary fencing to prevent vehicles driving on the edge of them;
- Turves will not be stored on good quality habitat;
- Turves will be re-used in areas with similar vegetation and hydrology;
- Turves should be replaced as soon as possible after the initial cut, however can be stored up to two months under the right conditions during March/September (the growing season);
- Turf transfer will not be undertaken in periods of hot and dry conditions or sub-zero conditions to avoid desiccation or frost damage; and
- Turves will be monitored and watered during dry and windy spells to ensure they remain viable and do not desiccate.

Turf management would also be undertaken throughout the onshore works where practicable. For the construction phase of the project, a detailed Materials Management Plan will be developed by the contractor and submitted for acceptance by the client. All construction works will be programmed and undertaken to meet any planning and environmental constraints that are imposed on the works. It is however anticipated that the works will be phased to minimise environmental impact and disruption to local receptors. Construction of the works will be phased to suit available land take (e.g. stockpile and laydown areas) which will accommodate the temporary storage of turf as required.

Soil management

A SMP would be produced as part of the CoCP by a competent soil science contractor and agreed with the IoACC (and NRW applicable). This would be completed pre-construction once an earthworks contractor has been appointed and detailed earthworks phasing information is available. The contractor would be required to comply with the SMP. The SMP will include, but not be limited to, the following measures:

- The separate storage of topsoil and excavated materials, to prevent mixing of subsoil and topsoil, thus improving reinstatement;

- Topsoil from unimproved or semi-improved areas will be kept separate from improved topsoil;
- Minimising excavation volumes and disturbance to the surrounding areas, together with the replacement of any soils inadvertently disturbed during excavations in general accordance with their original structure and location;
- Protocols for works in wet weather to minimise accumulation of mud within the working corridor and runoff into the SAC / unimproved neutral grassland; and
- The setting of vehicular speeds along the construction access routes to minimise soil compaction.
- Any stockpiles of excavated material shall be covered, seeded or fenced to prevent wind whipping or wind/water erosion.
- Where surface vegetation has been removed, this will be reseeded to prevent future runoff.

Ecological Action Plan
The Ecological Action Plan (EAP) will include the relevant habitat management measures and will detail:

- A defined area which will be subject to the plan;
- The scope and methodology for all pre-construction surveys;
- Details of suitable planting and ground preparation and planting methodology;
- Details of any post-creation monitoring surveys, reporting and reviewing required;
- A schedule/programme for delivery of the plan;
- Responsibilities attributed to the relevant parties to deliver the plan; including creation, maintenance and monitoring of the new habitat; and
- Consideration of the future of the new habitat following decommissioning of the landfall Substation site.
- This plan will be developed in consultation with the relevant stakeholders and should be complimentary to other proposed mitigation measures

Residual impacts
Under the secondary option, i.e. open cut trenching, following the implementation of mitigation including undertaking pre-construction surveys to aid micrositing, seed collection soil and turf management vegetation on the neutral grassland is expected to recover over a number of seasons (approximately five to ten years, Natural England, 2007) and will be monitored through post construction surveys with consultation with NRW of results. The potential impacts associated with construction upon sensitive habitat outwith the designated site is anticipated to be reduced to **minor adverse.**

Indirect impacts

There is potential for indirect impacts to occur should surface water run-off of sediments occur from the construction footprint, including stockpiles of excavated material during the trenching activities, and contaminate or smother highly sensitive maritime grassland at the coast. Impacts associated with run off are considered to be of up to negligible magnitude with effects occurring in the long term due to poor rates of recovery of sensitive habitats in stressful environmental conditions at the coast. This is anticipated to be of up to **minor adverse** significance, depending in the amount of habitat affected. Embedded mitigation measures include adherence to all relevant industry best practice to manage the accidental release and control of material, including run-off. Additional mitigation measures are discussed below.

A water resources assessment has been undertaken and is presented in Chapter 17, Water Resources and Flood Risk of the Morlais ES. The assessment concluded no significant impacts. There is no hydrological connection to the protected sites in terms of surface water, and the excavations are shallow

enough to have no significant impact on groundwater flow. As such, there is not anticipated to be any hydrological impacts which may affect the habitats or species at the coast.

Air quality impacts on designated ecological sites are considered in Chapter 22, Air Quality of the Morlais ES. Impacts on designated sites relating to construction phase dust and particulate matter emissions were considered. Risk of dust impacts to ecological receptors, including the designated sites, were assessed to be high during earthworks, low during construction activities and medium from track out from Heavy Goods Vehicles (HGV) movements. With the implementation of the recommended mitigation measures, i.e. adherence to best practice dust minimisation and suppression methods as recommended by the Institute of Air Quality Management (IAQM), including creation of a Dust Management Plan (DMP), impacts to ecological receptors are considered to be not significant. There are not anticipated to be any significant impacts on sensitive habitats associated with road traffic emissions due to the expected low number of vehicle movements in the construction, operational and decommissioning phases.

Additional Mitigation

Control of sediment supply

Measures contained within the CoCP and the PPMP will be designed to limit the potential for dispersal and accidental releases of potential contaminants, soil derived dusts and uncontrolled run-off to occur during construction. The CoCP and the PPMP would be developed for the construction activities which will adhere to all relevant legislation and industry good practice guidance as detailed in NRW's series of Sector Guidance Notes (SNG) and Technical Guidance Notes (TNG) to advise operators on standards for operational and environmental performance. There are regularly updated, and a list will be compiled prior to commencement of construction to ensure currency of advice. Areas covered by the notes will include:

- Guidance for storage and handling of materials,
- Guidance for site drainage and effluent management; and
- Guidance on environmental best practice.

Best practice measures from Construction Industry Research and Information Association (CIRIA)'s 'Control of water pollution from construction sites: Guidance for consultants and contractors (C532)' (2001) will also be implemented with agreement from NRW.

The PPMP will include the following:

- Subsoil exposure would be minimised, and strips of undisturbed vegetation would be retained on the edge of the working area where possible;
- On-site retention of sediment would be maximised by routing all drainage through the site drainage system;
- The drainage system would include measures to intercept sediment runoff at source. Suitable filters would be used to remove sediment from any water discharged into the surface drainage network;
- Additional measures would be included in parts of the working area that are in proximity to surface drainage channels;
- Soil and sediment accumulation on road surfaces would be minimised as reasonably practicable by cleaning the wheels of vehicles leaving site and, where required, clearance of the road surface. Traffic movement would be restricted to minimise the potential for surface disturbance;
- The works area would aim to avoid water resources and flood risk receptors wherever possible.
- The CMS will set out how material is to be excavated and stockpiled to minimise the potential for run-off, soil degradation or wind dispersal of dusts, including consideration of local natural drainage to enable the precise location of stockpile material to drain into local natural soil drainage system;

- The covering of long-term stockpiles with sheeting or the binding of the surface through temporary grass seeding will be specified together with dampening procedures during dry weather.
- In the event of uncontrolled releases occurring, the CMS and the Contractor's own method statements contained in their Construction Phase Plan (CPP) would also set out the measures required to ensure that the extent and impact of any such releases are contained and ultimately remediated.
- Construction materials and spoil materials will be positioned in a manner that does not constrain potential flood waters unduly or direct flood waters towards habitats of high sensitivity.
- Construction will not be undertaken during very extreme wet weather where erosion of sediments and risk from flooding may increase.
- The avoidance of soil compaction through the use of Low Ground Pressure (LGP) tracked or wheeled tyres to spread the weight of vehicles, limiting the height of soil stockpile mounds, restricting construction traffic to specific areas on the construction working width.

Further details on mitigation for release of contaminants is provided in Chapter 18 Ground Conditions and Contamination of the Morlais ES.

Soil management Plan
A SMP would be produced as part of the CoCP by a competent soil science contractor and agreed with the IoACC (and NRW as applicable). This would be completed pre-construction once an earthworks contractor has been appointed and detailed earthworks phasing information is available. The contractor would be required to comply with the SMP. The SMP will include, but not be limited to, the following measures:

- The separate storage of topsoil and excavated materials, to prevent mixing of subsoil and topsoil, thus improving reinstatement;
- Minimising excavation volumes and disturbance to the surrounding areas, together with the replacement of any soils inadvertently disturbed during excavations in general accordance with their original structure and location;
- Protocols for works in wet weather to minimise accumulation of mud within the working corridor and runoff into the SAC / unimproved neutral grassland; and
- The setting of vehicular speeds along the construction access routes to minimise soil compaction.
- Any stockpiles of excavated material shall be covered, seeded or fenced to prevent wind whipping or wind/water erosion.
- Where surface vegetation has been removed, this will be reseeded to prevent future runoff.
- This plan will be developed with the relevant stakeholders and should be complimentary to other proposed mitigation measures

Residual impact
Following implementation of the mitigation measures to protect stockpiles and other areas of the construction site from run-off impacting upon the sensitive coastal habitats, including the designated site, the potential indirect impacts associated with run-off are reduced to **negligible** in significance.

6.3 Potential operation and maintenance impacts on Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC

6.3.1 Preferred Option: HDD at landfall

Under the preferred option, there will be no pathway for impact and therefore **no direct impact** to the designated site during operation and maintenance.

Mitigation
None required

Residual Impact
There will remain to be **no direct impact**.

6.3.2 Secondary Option: Trenching at landfall

As discussed above, as maintenance activities are estimated to occur as frequently as every five years, and habitat recovery is likely to be more than five years on the cliffs, it is therefore considered that this would be a long term impact upon the cliffs. Our analysis suggests a worst case maximum 0.046% of designated feature is anticipated to be directly impacted in the long term for the life of the project plus recovery of the vegetation. It is likely that the actual area affected by maintenance works will be less than the 0.046% worst case loss as habitat lost through installation and maintenance will be minimised to only those areas requiring inspection or intervention. There may be a shading or a sheltering effect which might lead to the growth of different plants, not normally part of the vegetated sea cliff community. A reduced influence of salt spray will occur within the footprint of the cable chute, as this will provide protection/ cover across much of its footprint, although gaps will remain of 500mm between cables where some limited salt spray influence may occur. There will be limited shading and no loss of salt spray influence in the working area either side of the chute. There will be, at worst case, loss of epilithic lichens within the whole footprint. Disturbance by seabirds, essential for ephemeral sea cliff plant species could continue to take place within the working footprint (though not during temporary maintenance activities whilst maintenance activities take place on the cliff). This impact would be reversable upon decommissioning and recovery, however as this is likely to be in excess of 40 years (project life of 37 years plus recovery of 5-10 years),. Overall, the impact is anticipated to be **minor adverse** in significance, which is not significant in EIA terms.

Mitigation
Under the secondary option, i.e. trenching, beyond the measures already made to avoid and minimise direct impacts upon the SAC/SSSI features through micro siting, reduction of footprint and adaptation of methods to be used during construction, no further mitigation is considered to be successful upon the sea cliff habitat due to ongoing disturbance through 5 yearly maintenance activities.

Residual Impact
The impact to the designated feature of the SAC/SSSI therefore remains **minor adverse** in significance during construction, operation and decommissioning phases. Works to undertake biodiversity net gain will be reliant upon further survey and consultation with IoACC and NRW.

6.4 Potential operation and maintenance impacts on sensitive grasslands outwith the boundary of the Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC

6.4.1 Preferred Option: HDD at landfall

Under the preferred option, there will be no pathway and therefore impact to the neutral grassland during operation and maintenance.

Mitigation
None required

Residual Impact
There will remain to be **no direct impact**.

6.4.2 Secondary Option: Trenching at landfall

As the man hole covers for the nine draw pits will be left in place for access, activities associated with operation and maintenance will be considerably less than those associated for construction. Temporary lay down areas may be required for plant and equipment, which would be stored within the footprint identified for construction and not upon sensitive habitat. There is not anticipated to be excavation works associated with operation and maintenance. As such the magnitude of effect is considered to be negligible and the impact is assessed to be of **minor adverse** in significance.

Mitigation
Pre-construction survey
Prior to construction, further detailed botanical survey work will be undertaken to record the presence and extent of spatulate (South Stack) fleawort, golden-hair lichen and spotted rock-rose (and other areas of botanically rich vegetation) so that minimal impacts to these species and their associated habitats can be experienced. Such survey work should be carried out in May or June when fleawort is in flower to aid with micrositing activities. The design of the survey will be undertaken in consultation with the IoACC and NRW and will take the form of a Phase II National Vegetation Classification Survey (by NRW approved contractors with relevant qualifications and experience in surveying vertical cliff face vegetation) and will extend at least 20m from the cliff top inland and finish at break of slope on the seaward side. Fixed point photographs will be used as part of the survey procedure. Survey on the cliff may be undertaken by drone, supplemented by a roped-access botanical survey by suitably-qualified botanist to allow for identification of small specimens of rare plants. This will also include photography of the cliff face to provide an understanding of density of the plant growth.

Seed collection
Seed collection will be undertaken in late summer / autumn prior to construction from the areas of unimproved neutral grassland habitat. In some areas it may be preferable to reseed using “Rytecced” (heathers) from local heathland, as clifftop neutral grassland has been previously mapped as heathland by CCW’s Phase 1 surveyors (NRW, pers comm) and therefore the clifftop habitat may be a heath/neutral grassland mosaic. NRW have expressed preference to restore to heath in such case. Following the NVC survey, NRW will be consulted to agree the habitats that will be restored at the cliff top. All collected seeds will be suitably stored and used to aid habitat replacement on completion of the works and within the agreed areas. It is accepted that the seeds may not be successful in establishing. All replanting will comprise species suitable to the area, particularly near the boundary of the SAC. Monitoring of the

replanted areas will be undertaken to understand the diversity that returns, and results will be provided to NRW.

Turf management Plan
A Turf Management Plan (TMP) will be created and included within the CEMP. Works to install the J-tubes on the cliffs have been designed to be undertaken manually to minimise the disturbance and removal of cliff vegetation, however the worst case assumes the disturbance / loss of all vegetation within the corridor of works on the cliffs. Re-turfing of the works within the SAC is considered to not be possible due to the steepness of the terrain and the fragility/thinness of associated soils. In addition, the stressful environmental conditions would reduce the likelihood of replaced vegetation establishing, and as monitoring is proposed to take place approximately every 5 years, there is potential for more disturbance to occur before the habitat has recovered. Therefore, no habitat replacement is proposed upon the cliffs within the SAC.

Soil depths at the top of the cliff are currently unknown but are considered to be shallow. The success of a turf management regime is therefore currently unknown, however if it is practicable to do so, the following turf management will be implemented.

Turf removed at the top of the cliff will be carefully managed to allow for reinstatement upon completion of the works. This will include the following measures:

- Stripped turves will be stored (labelled) within the stockpiling areas 'vegetation or turf side up' with adequate growing conditions e.g. water (including during dry or windy conditions), light and temperature;
- Turves will be protected through temporary fencing to prevent vehicles driving on the edge of them;
- Turves will not be stored on good quality habitat;
- Turves will be re-used in areas with similar vegetation and hydrology;
- Turves should be replaced as soon as possible after the initial cut, however can be stored up to two months under the right conditions during March/September (the growing season);
- Turf transfer will not be undertaken in periods of hot and dry conditions or sub-zero conditions to avoid desiccation or frost damage; and
- Turves will be monitored and watered during dry and windy spells to ensure they remain viable and do not desiccate.

Turf management would also be undertaken throughout the onshore works where practicable.

Turf management would also be undertaken throughout the onshore works where practicable. Stockpile areas have been designed to ensure enough space for turf storage.

Soil management Plan
A SMP would be produced by a competent soil science contractor and agreed with the IoACC (and NRW as applicable). This would be completed pre-construction once an earthworks contractor has been appointed and detailed earthworks phasing information is available. A consideration of soil management required under operational conditions will be included as part of the overall project SMP.

Habitat Management Plan
The habitat management plan will be agreed with NRW and IoACC and will be included within the EAP and will include consideration of the habitat management actions which may be required under operational conditions.

Residual impacts
Under the secondary option, i.e. open cut trenching, following the implementation of mitigation including undertaking pre-construction surveys to aid micrositing, seed collection soil and turf management vegetation on the neutral grassland is expected to recover over a number of seasons (approximately five to ten years, Natural England, 2007) and will be monitored through post construction surveys with consultation with NRW of results. The potential impacts associated with construction upon sensitive habitat outwith the designated site is anticipated to be reduced to **negligible.**

6.5 Potential decommissioning impacts on Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC

All decommissioning mitigation will be reviewed and updated using best practice guidance at the time of decommissioning activities,

6.5.1 Preferred Option: HDD at landfall

Under the preferred option, there will be no pathway and therefore impact to the designated site during decommissioning.

Mitigation
None required

Residual Impact
There will remain to be no direct impact.

6.5.2 Secondary Option: Trenching at landfall

As discussed above, as decommissioning activities are anticipated to be undertaken on the cliffs with the decommissioning work footprint to remove J-tubes. Taking a worst case, it is possible that decommissioning works may affect, 0.046%, a near negligible amount of the designated cliff feature. This impact would be reversable upon decommissioning however revegetation is not guaranteed to be successful in such stressful environmental and climatic conditions and at best is assumed to be 5-10 years. Overall, the impact is anticipated to be **minor adverse**, which is not significant in EIA terms.

Mitigation
Under the secondary option,, beyond the measures already made to avoid and minimise direct impacts upon the SAC/SSSI features through micro siting, reduction of footprint and adaptation of methods to keep the J tubes away from the cliff face to be used during construction, no further mitigation is considered to be successful upon the sea cliff habitat due to ongoing disturbance through 5 yearly maintenance activities.

Residual Impact
The impact to the designated feature of the SAC/SSSI therefore remains **minor adverse** in significance during construction, operation and decommissioning phases. Works to undertake biodiversity net gain will be reliant upon further survey and consultation with IoACC and NRW

6.6 Potential decommissioning impacts on sensitive grasslands outwith the boundary of the Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC

6.6.1 Preferred Option: HDD at landfall

Under the preferred option, there will be no pathway for impact to the neutral grassland during decommissioning.

Mitigation
None required

Residual Impact
There will remain to be no direct impact.

6.6.2 Secondary Option: Trenching at landfall

During decommissioning, chamber covers to the draw pits will be removed and the voids backfilled and covered with topsoil and turf. Buried cables will not be excavated and therefore the footprint of decommissioning activities will be reduced from that which is required for construction. the magnitude of impact is assessed to be low. As such, the impacts to the neutral unimproved grassland at the coast are assessed to be **moderate adverse**, which is significant in EIA terms.

Mitigation
Pre- decommissioning survey
Prior to construction, further detailed botanical survey work will be undertaken to record the presence and extent of spatulate (South Stack) fleawort, golden-hair lichen and spotted rock-rose (and other areas of botanically rich vegetation) so that minimal impacts to these species and their associated habitats can be experienced. Such survey work should be carried out in May or June when fleawort is in flower to aid with micrositing activities. It may not be possible to undertake this survey safely upon the cliffs themselves, in which case survey may be conducted by alternative methods, such as use of drones. The design of the survey will be undertaken in consultation with the IoACC and NRW.

Seed collection
Seed collection will be undertaken in late summer / autumn prior to construction from the areas of unimproved neutral grassland habitat. In some areas it may be preferable to reseed using “Rytecced” from local heathland, as clifftop neutral grassland has been previously mapped as heathland by CCW’s Phase 1 surveyors (NRW, pers comm) and therefore the clifftop habitat may be a heath/neutral grassland mosaic. NRW have expressed preference to restore to heath in such case. Following the NVC survey, NRW will be consulted to agree the habitats that will be restored at the cliff top. All collected seeds will be suitably stored and used to aid habitat replacement on completion of the works and within the agreed areas. It is accepted that the seeds may not be successful in establishing. All replanting will comprise species suitable to the area, particularly near the boundary of the SAC. Monitoring of the replanted areas will be undertaken to understand the diversity that returns, and results will be provided to NRW.

Turf management Plan
Turf removed at the top of the cliff will be carefully managed to allow for reinstatement upon completion of the works. This will include the following measures:

- Stripped turfs will be stored (labelled) within the stockpiling areas 'vegetation or turf side up' with adequate growing conditions e.g. water (including during dry or windy conditions), light and temperature;
- Turves will be protected through temporary fencing to prevent vehicles driving on the edge of them;
- Turves will not be stored on good quality habitat;
- Turves will be re-used in areas with similar vegetation and hydrology;
- Turves should be replaced as soon as possible after the initial cut, however can be stored up to two months under the right conditions during March/September (the growing season);
- Turf transfer will not be undertaken in periods of hot and dry conditions or sub-zero conditions to avoid desiccation or frost damage; and
- Turves will be monitored and watered during dry and windy spells to ensure they remain viable and do not desiccate.

Turf management would also be undertaken throughout the onshore works where practicable.

Turf management would also be undertaken throughout the onshore works where practicable. Stockpile areas have been designed to ensure enough space for turf storage.

Soil Management Plan
A SMP would be produced by a competent soil science contractor and agreed with the IoACC (and NRW as applicable). This would be completed pre- decommissioning works once an earthworks contractor has been appointed and detailed earthworks phasing information is available. The contractor would be required to comply with the SMP. The SMP will include, but not be limited to, the following measures:

- The separate storage of topsoil and excavated materials, to prevent mixing of subsoil and topsoil, thus improving reinstatement;
- Topsoil from unimproved or semi-improved areas will be kept separate from improved topsoil;
- Minimising excavation volumes and disturbance to the surrounding areas, together with the replacement of any soils inadvertently disturbed during excavations in general accordance with their original structure and location;
- Protocols for works in wet weather to minimise accumulation of mud within the working corridor and runoff into the SAC / unimproved neutral grassland; and
- The setting of vehicular speeds along the construction access routes to minimise soil compaction.
- Any stockpiles of excavated material shall be covered, seeded or fenced to prevent wind whipping or wind/water erosion.
- Where surface vegetation has been removed, this will be reseeded to prevent future runoff.

Habitat Management Plan
The habitat management plan will be agreed with NRW and IoACC and will be included within the EAP and will include:

- A defined area which will be subject to the plan (in consultation with NRW and IoACC);
- The scope and methodology for all pre-construction surveys;
- Details of suitable planting and ground preparation and planting methodology;
- Details of any post-creation monitoring surveys, reporting and reviewing required;
- A schedule/programme for delivery of the plan;
- Responsibilities attributed to the relevant parties to deliver the plan; including creation, maintenance and monitoring of the new habitat; and

- Consideration of the future of the new habitat following decommissioning of the landfall Substation site.
- This plan will be developed with the relevant stakeholders and should be complimentary to other proposed mitigation measures

Residual impacts

Under the secondary option, i.e. open cut trenching, following the implementation of mitigation including undertaking pre-construction surveys to aid micrositing, seed collection soil and turf management vegetation on the neutral grassland is expected to recover over a number of seasons (approximately five to ten years, Natural England, 2007) and will be monitored through post construction surveys with consultation with NRW of results. The potential impacts associated with construction upon sensitive habitat outwith the designated site is anticipated to be reduced to **minor adverse**.

7 Mitigation

The following additional mitigation measures are committed to and proposed to reduce potential impacts from construction, operation and maintenance and decommissioning upon onshore ecology receptors, with particular focus on the sensitive habitats at the landfall:

7.1 General terrestrial ecology mitigation as outlined within the ES:

The mitigation stated below is relevant to the whole Onshore Development Area:

- Prior to construction, further detailed botanical survey work will be undertaken to record the presence and extent of spatulate (South Stack) fleawort, golden-hair lichen and spotted rock-rose (and other areas of botanically rich vegetation) so that minimal impacts to these species and their associated habitats can be experienced. Such survey work should be carried out in May or June when fleawort is in flower. This survey work will support the decision of where the Onshore Cable Route is micro-sited to, enabling the footprint of overlap into the RSPB reserve to be minimised;
- An invasive non-native species survey will be undertaken prior to construction, to allow for any existing or stands to be treated prior to construction or fenced to avoid disturbance.
- An ECoW will audit the implementation of the Ecological Action Plan (EAP). Details of the ECoW along with their qualifications, licencing and contact details will be sent to NRW as soon as they are appointed for approval.
- Consultation with NRW and RSPB will be undertaken to agree the final micro-siting of the cable route.
- Toolbox talks will be delivered by the ECoW to all construction personnel starting work at the construction site, detailing the importance of the protection of the designated sites.
- A strict construction working footprint will be maintained
- Temporary fencing will be installed to physically delineate the rest of the designated site from the construction footprint;
- Materials and plant will be stored within the construction footprint on less sensitive habitat where possible;
- Habitats affected within and outwith the designated site will be combined within the habitat reinstatement plan; and
- A habitat re-instatement plan will be implemented upon completion of the works. Any replanting will comprise of species suitable to the area, particularly near the boundary of the SAC.
- Root protection areas in accordance with industry guidance will be fenced off during construction;

- A pre-construction assessment of all trees to be removed will be undertaken by a suitably qualified arboriculturist (and ecologist if required);
- Where hedgerows are disturbed, they will be replaced following completion of construction activities to the same quality or better, with native species of local provenance and suitable for the area. The replanting plan will be detailed in the EAP and agreed with NRW and IoACC;
- To mitigate impacts to the open mosaic habitat at the aluminium works (discussed further within the ES), habitat reinstatement will be undertaken upon completion of the construction phase. This would involve the reinstatement of excavated material in a way that would provide low nutrient substrate suitable for ephemeral vegetation. The replanting plan will be detailed in the EAP. Since this area is subject to scrub encroachment it is possible that some localised disturbance will be beneficial (to reduce scrub and maintain patches of open habitat);
- Night-time lighting of construction sites should be avoided where possible. If night-time working is necessary, then lighting will be designed in accordance with Bats and artificial Lighting in the UK (BCT, ILE, 2018); and Guidance Notes for the Reduction of Obtrusive Light ILE (2011). This is likely to require:
    - No direct lighting of the woodland edges, scrub and hedgerow habitats, or historic roost site and use of dark buffer zones; and
    - Consideration of appropriate luminaire specifications, sensitive light configuration, screening, glazing, dimming and part-night lighting to minimise impacts;
- Scrub, hedgerow, marshy grassland and maritime cliff and slope habitat that cannot be avoided will be subject to pre-construction walkover habitat survey by experienced ecologist in advance of construction commencing to inform the habitat reinstatement plans.
- Habitat reinstatement will be undertaken following completion of construction, using native species of local provenance. Landscaping plans will take into consideration of creation of breeding bird habitat
- The location of the wild leek and small flowered catchfly will be clearly marked and identified with 5 m buffer fencing, and this area will be avoided during any construction work. This may require a bypass section of track to be temporarily constructed.
- Pre-construction checks for barn owl will include mature trees will be undertaken by an experienced ecologist to ensure no impacts occur to this species.

7.1.1 Update to mitigation proposed for Cloddiau / Hedgerows

In response to consultation undertaken with NRW, who raised concerns regarding the impacts associated with the removable and re-construction of cloddiau, trenchless methods will be now employed to cross under cloddiau to avoid direct impact to these features. Consequently, there will be **negligible** impact upon the cloddiau features.

Many of the hedgerows are recorded as species poor / defunct. Pre-construction, an assessment will be made of all hedgerows to be crossed. IoACC will be contacted for their records of important hedgerows during this process. Following this assessment, those hedgerows of ecological, landscape, heritage or other importance will be crossed using trenchless methods. This assessment will be agreed with NRW prior to construction.

7.1.2 Update to mitigation proposed for invasive non-native species

- An Invasive Species Management Plan will be prepared, focusing on the species listed on Schedule 9 of the Wildlife and Countryside Act, 1981, as amended which will include best practice measures to be implemented to minimise the risk of construction activities spreading non-native invasive species,

- A toolbox talk detailing the importance of these plant species will be delivered by the ECoW to all personnel working on site.
- A pre-construction survey will be undertaken to ascertain up-to-date locations of any non-native invasive species within the Study Area;
- Known Japanese knotweed stands (and any other invasive non-native species subsequently recorded) in or within 10m of the Onshore Development Area will be treated during the season before construction work commences.
- An Invasive Species Management Plan will be included in the EMP which will detail the policies and good working practices which will be followed to avoid spread of an invasive non-native species; Mitigation measures including biosecurity protocols in the Invasive Species Management Plan will be carried across to the CoCP, and
- A fenced buffer of 10 m will be placed around strands of invasive species that have not been treated and are subsequently found on site after construction has begun.

8 Summary of impacts to Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC and neutral grassland habitat

A summary of impacts is provided in Table 8.1.

Table 8.1 Summary of impacts

Impact	Direct / indirect effects	Sensitivity	Magnitude	Significance	Mitigation	Residual impact
Construction						
Construction impacts to Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC	Preferred Option: HDD at landfall: direct impacts	High	No pathway	No impact	None required	No impact
	Preferred Option: HDD at landfall: indirect impacts	High	negligible	minor adverse	sediment supply management, soil management	negligible
	Secondary Option: trenching at landfall: direct impacts	High	Low/ negligible	Minor adverse	No additional mitigation proposed	Minor adverse
	Secondary Option: trenching at landfall: indirect impacts	High	negligible	minor adverse	sediment supply management, soil management	negligible
Potential construction impacts on sensitive grasslands outwith the boundary of the Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC	Preferred option: HDD at landfall: direct impacts	High	No pathway	No impact	None required	No impact
	Preferred Option: HDD at landfall: indirect impacts	High	negligible	minor adverse	sediment supply management, soil management	negligible
	Secondary Option: trenching at landfall: Direct impacts	High	Low	Moderate adverse	Preconstruction surveys, soil turf and habitat management,	Minor adverse
	Secondary option: trenching at landfall: Indirect impacts	High	negligible	minor adverse	sediment supply management, soil management	negligible
Operation and maintenance						

Impact	Direct / indirect effects	Sensitivity	Magnitude	Significance	Mitigation	Residual impact
Potential operation and maintenance impacts on Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC	Preferred option HDD at landfall:	High	No pathway	No impact	None required	No impact
	Secondary option trenching at landfall:	High	Low/ negligible	Minor adverse	No additional mitigation proposed	Minor adverse
Potential operation and maintenance impacts on sensitive grasslands outwith the boundary of the Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC	Preferred option HDD at landfall:	High	No pathway	No impact	None required	No impact
	Secondary option trenching at landfall:	High	Negligible	Minor adverse	Preconstruction surveys, soil turf and habitat management,	Negligible
Decommissioning						
Potential decommissioning impacts on Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC	Preferred option HDD at landfall:	High	No pathway	No impact	None required	No impact
	Secondary option trenching at landfall:	High	Low/ negligible	Minor adverse	No additional mitigation proposed	Minor adverse
Potential decommissioning impacts on sensitive grasslands outwith the boundary of the Glannau Ynys Gybi /Holy Island Coast SSSI, SPA, SAC	Preferred option HDD at landfall:	High	No pathway	No impact	None required	No impact
	Secondary option trenching at landfall:	High	Low	Moderate adverse	Preconstruction surveys, soil turf and habitat management,	Minor adverse

Under the preferred option, should the landfall be undertaken using HDD technology, there will be no significant impacts to the Glannau Ynys Gybi / Holy Island Coast SAC/SSSI or the sensitive habitats at the coast.

Should HDD not be possible at landfall, the secondary option to trench the cables at the landfall and associated works at the cliffs results in a worst case impact of minor adverse significance upon a maximum 510 m^2 of vegetated cliff, equating to a maximum 0.046% of the designated feature within the SAC, which is not considered significant in EIA terms and is not further mitigatable.

Potential measures may be taken through Biodiversity Net Gain. It is recognised that the cliff habitat is important and habitat enhancement of the cliff habitat is unlikely to be successful to the stressful environmental conditions along the Holy Island Coast. Menter Môn recognises the importance of the distinctive cliff habitat off Holy Island and would welcome advice from NRW on actively seeking engagement to enter into a Biodiversity Net Gain initiative in relation to cliff habitat on Holy Island.

9 HRA

This paper is intended to consider the EIA and to update the impact assessment made within the ES. This section of the paper also briefly considers and updates the HRA to take account of the Secondary option of installing cables down the cliffs as part of the trenching at landfall option.

It must be noted, as stated in document MOR/RHDHV/DOC/0067: Information to Support Habitats Regulations Assessment, should HDD (the preferred choice) be used as the landfall methodology, the Glannau Ynys Gybi / Holy Island Coast SAC and its qualifying features will be avoided entirely and therefore no Likely Significant Effect (LSE) associated with habitat loss screened out of further assessment under this option. Consequently, this section considers only the potential impacts to the Holy Island Coast SAC designated features arising from the implementation of the secondary cable installation option.

9.1 Conservation objections of the SAC

The Conservation Objectives for the SAC are for the vegetated coastal cliffs to remain largely undisturbed and support the endemic South Stack fleawort and other notable plants. Also, that 70% of the SPA should be characterised by good quality lowland and coastal heath and that in some areas where there are rocky outcrops in heathland, the habitat should be favourable for the spotted rock rose which occurs in the thin crusts of soil with lichens and mosses and short grasses. Areas of herb rich neutral grassland may be maintained for their floristic, invertebrate and chough feeding value.

9.2 Potential impacts to the conservation objectives

The construction methodology will use a platform which may result in disturbance and physical damage in worst case scenario within the entire 11m wide working corridor, and maintenance every 5 years will impede recovery within a worse case of the whole footprint of the cliff works. There may be differential shading different to the surrounding unaffected cliff, but these is not anticipated to extend beyond the 2m working buffer either side of the cables. Measures have already been made to minimise impacts to the SAC feature further, through keeping the cables off the cliff face where possible, drilling in rock anchors to avoid impact on natural cliff process, drainage and soil formation behind the cables.

In the ES the area of SAC that was considered likely to be affected under the secondary cable installation option was up to 31,700$m^{2.}$ Following discussions with stakeholders the design envelope for this option has been refined to enable a much reduced footprint of impact. In the revised secondary option the area

of cliff habitat to be affected is 510 m^2 along with 162m^2 of cliff top neutral unimproved grassland within the designation boundary. This is a substantial mitigation through design refinement to reduce the area of impact to the features of the Glannau Ynys Gybi / Holy Island Coast SAC. Under the updated design, the area of vegetated sea cliff habitat to be lost for the duration of the project lifetime (37 years, plus recovery time post decommissioning) within the footprint of the affected area will be a maximum 0.029% of the sea cliff feature within the SAC along with 0.016% of sea cliff within the footprint of temporary works. As maintenance activities are anticipated every 5 years, i.e. before full recovery of the vegetation is anticipated, consequently, under the worst case scenario the area of the SAC to be impacted is 0.046% of the vegetated sea cliff feature. This worst case scenario assumes that the vegetated sea cliff feature within the entire footprint of the cliff works will be lost and unable to recover until after decommissioning works. This is unlikely to be the case but represents a conservative worst case impact assessment. As 99.95% of the feature is unaffected and the geological cliff feature itself is dynamic and subject to natural change though crumbling/rockfall, such a small scale loss will not result in an adverse effect on the integrity (AEOI) of the Glannau Ynys Gybi / Holy Island Coast SAC.

The worst case scenario applied above also assumes (in the absence of a detailed NVC survey which will be undertaken in the appropriate late spring season) that the vegetation on the cliff is all rare / vulnerable to potential change, as the feature is classed to be of excellent conservation status and of good value globally[1]. It is also assumed under the worst case scenario that the cliff is uniformly covered in vegetation. Consequently the impact to the removal of this small area of habitat is not anticipated to have an adverse effect on the ecological function of the sea cliffs in the wider SAC area or that it will cause significant severance.

All wet and dry heath designated habitat has already been avoided in the design of the Onshore Development Area.

An NVC botanical survey is proposed to be undertaken in late spring/ early summer 2020 to ascertain the species and habitat present within the footprint of the proposed works including the grassland and cliff habitats and further inform the HRA and micro-siting of the proposed works. The methodology for the survey will be developed, and agreed, in consultation with NRW.

10 Conclusions

A number of issues were raised by NRW and RSPB on the assessments for the onshore ecology within the ES and HRA documents. Many related to the lack of information clarity around proposed landfall activities and their potential impacts on designated sites and sensitive habitats. Following this, the methodologies that would be implemented at landfall have been considered further, with the aim to minimise impacts to designated sites through avoidance, reduction and design.

Under the preferred option of HDD at the landfall, there will be no direct impacts to the Glannau Ynys Gybi / Holy Island Coast SAC/SSSI and any potential indirect impacts will be mitigated and managed through agreed management plans. For clarity, the decision as to whether HDD would be possible will be confirmed prior to construction.

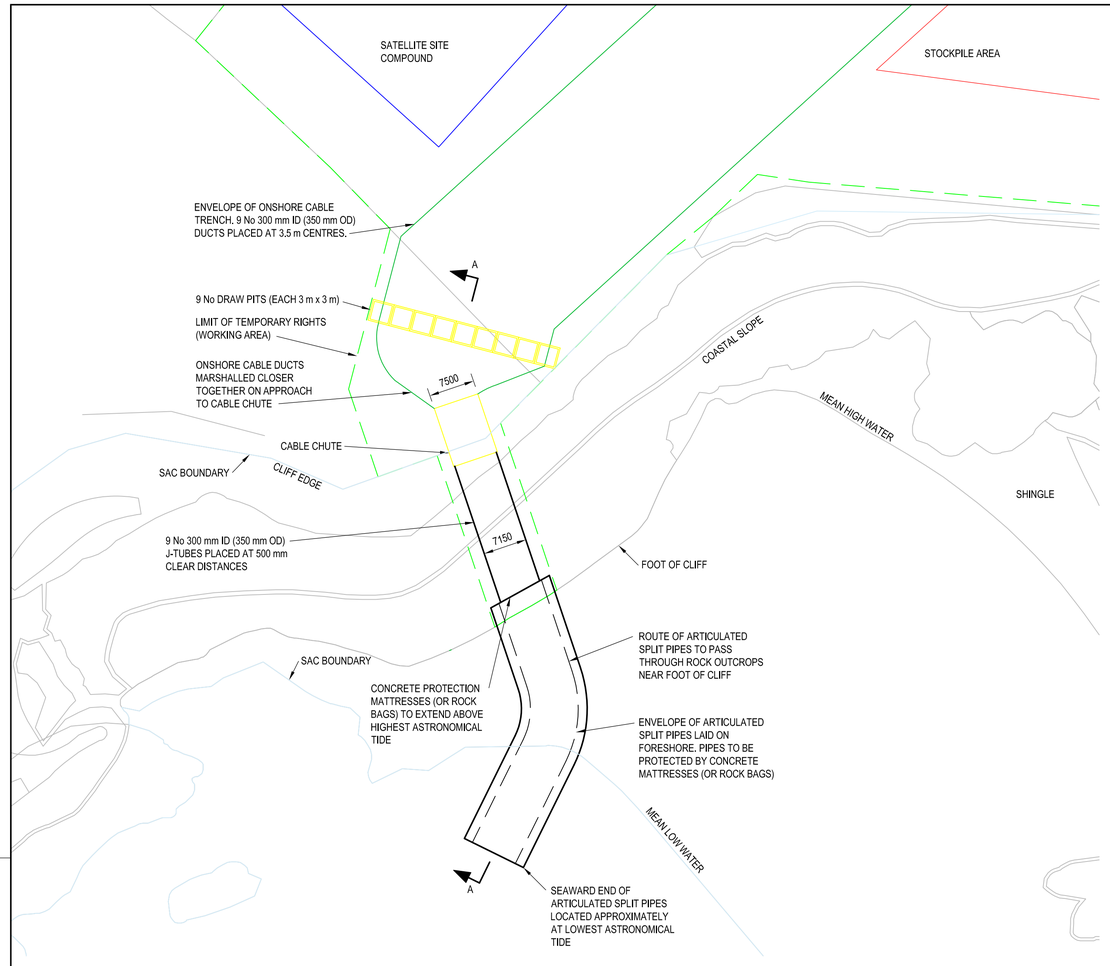
Should HDD not be possible, the secondary option of trenching at landfall will be required to bring cables ashore. Following mitigation, impacts to the vegetated sea cliffs designated feature of the Glannau Ynys Gybi / Holy Island Coast SAC/SSSI are considered to be long term minor adverse in significance for the

[1] https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0013046.pdf

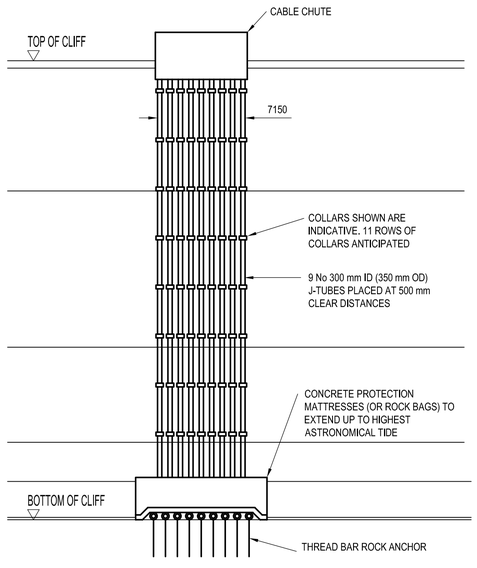
life of the project plus recovery of vegetation, which is not considered significant in EIA terms. Under HRA an assessment has been undertaken and the impact to the SAC, at 0.046%, would persist from construction for the during of the project (37 years plus recovery time post decommissioning), and the vast majority (99.95%) of the vegetated coastal cliffs will remain largely undisturbed in line with the conservation objectives, therefore an adverse effect on integrity of the Glannau Ynys Gybi / Holy Coast SAC site can be ruled out.

Following the IEMA guidance for the EIA Regulations the impact would be considered to be long term, however it must be recognised that, with respect to the Habitat Regulations, whilst the impact would persist through the construction and operation phases, the habitat recovery is expected be possible and should commence after decommissioning.

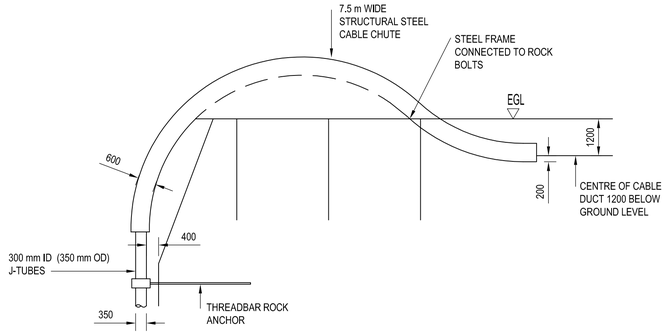
All other potential impacts have been reduced through mitigation or by refinement of the project design to be at worst minor adverse in significance, and not significant under EIA terms. They are also not considered to be likely to have an adverse effect on the SAC or its features.



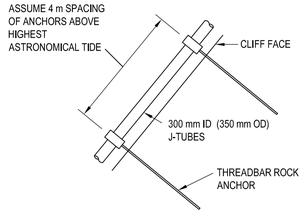
PLAN
SCALE 1:500



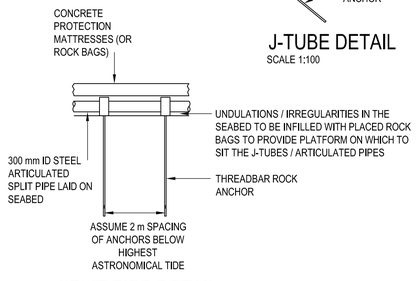
ELEVATION B
SCALE 1:250



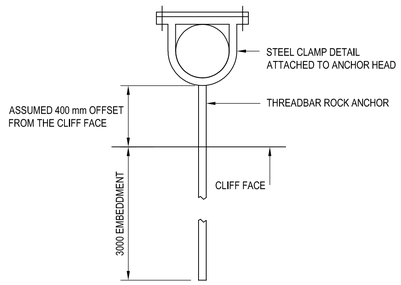
CABLE CHUTE DETAIL
SCALE 1:100



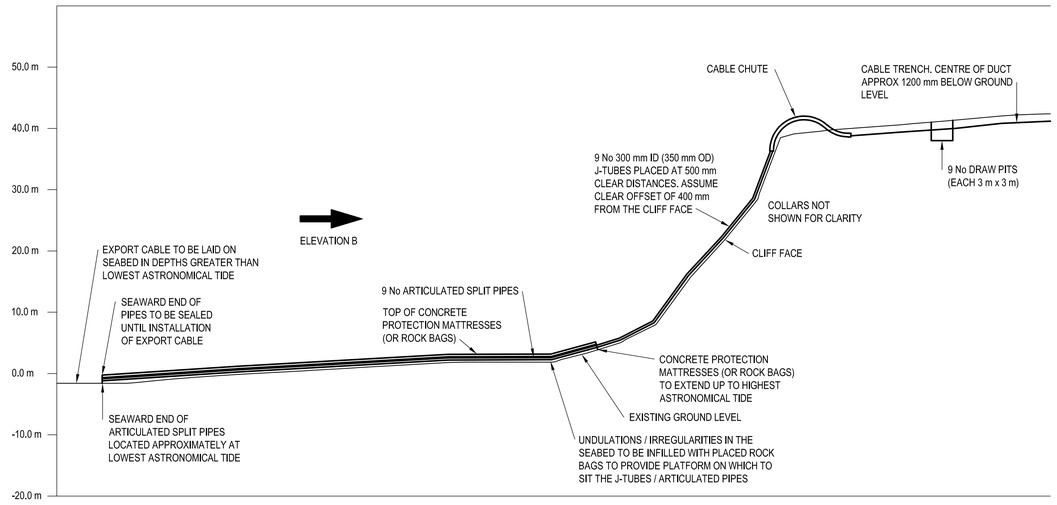
J-TUBE DETAIL
SCALE 1:100



SPLIT PIPE DETAIL
SCALE 1:100



CLAMP DETAIL
SCALE 1:20



SECTION A-A
SCALE 1:500

BV PROJECT NUMBER :

Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

NOTES:

1. SCHEME ARRANGEMENT IS INDICATIVE.
2. SERVICES NOT SHOWN.
3. LOCATION OF BURIED CHAMBERS SUBJECT TO CHANGE.
4. INTERNAL DIMENSIONS OF BURIED CHAMBERS DEFINED.
5. J-TUBES AND ARTICULATED SPLIT PIPES TO BE HEAVY DUTY MATERIAL SUCH AS STEEL.
6. ID = INTERNAL DIAMETER, OD = OUTER DIAMETER.
7. PREDICTION OF HYDRODYNAMIC LOADS, STRUCTURAL DESIGN, GEOTECHNICAL DESIGN, SEDIMENT (E.G. INGRESS INTO, OR BURIAL OF, SEAWARD END OF SPLIT PIPES) AND STABILITY CALCULATIONS HAVE NOT BEEN CONDUCTED.
8. SPECIAL AREA OF CONSERVATION BOUNDARY LINES PROVIDED BY ROYAL HASKONING DHV.
9. CONNECTION BETWEEN CABLE CHUTE AND ROCK BOLTS SUBJECT TO FURTHER DESIGN STUDIES.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER
CONSTRUCTION :
MAINTENANCE, CLEANING AND OPERATION :
DECOMMISSIONING OR DEMOLITION :

500mm 0mm 500mm 1000mm
Scale 1:20

4m 3m 2m 1m 0m 2m 4m
Scale 1:100

5m 0m 5m 10m 15m
Scale 1:250

10m 0m 10m 20m 30m
Scale 1:500

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	MH	ALJ	TB	TB	22/01/20	
P02	MH	DM	ALJ	TB	13/02/20	ISSUED FOR INFORMATION

Designed by: Date:

Status
S2 Suitable for Information

Client

MENTER MÔN

Client Drawing No. | Revision

BLACK & VEATCH

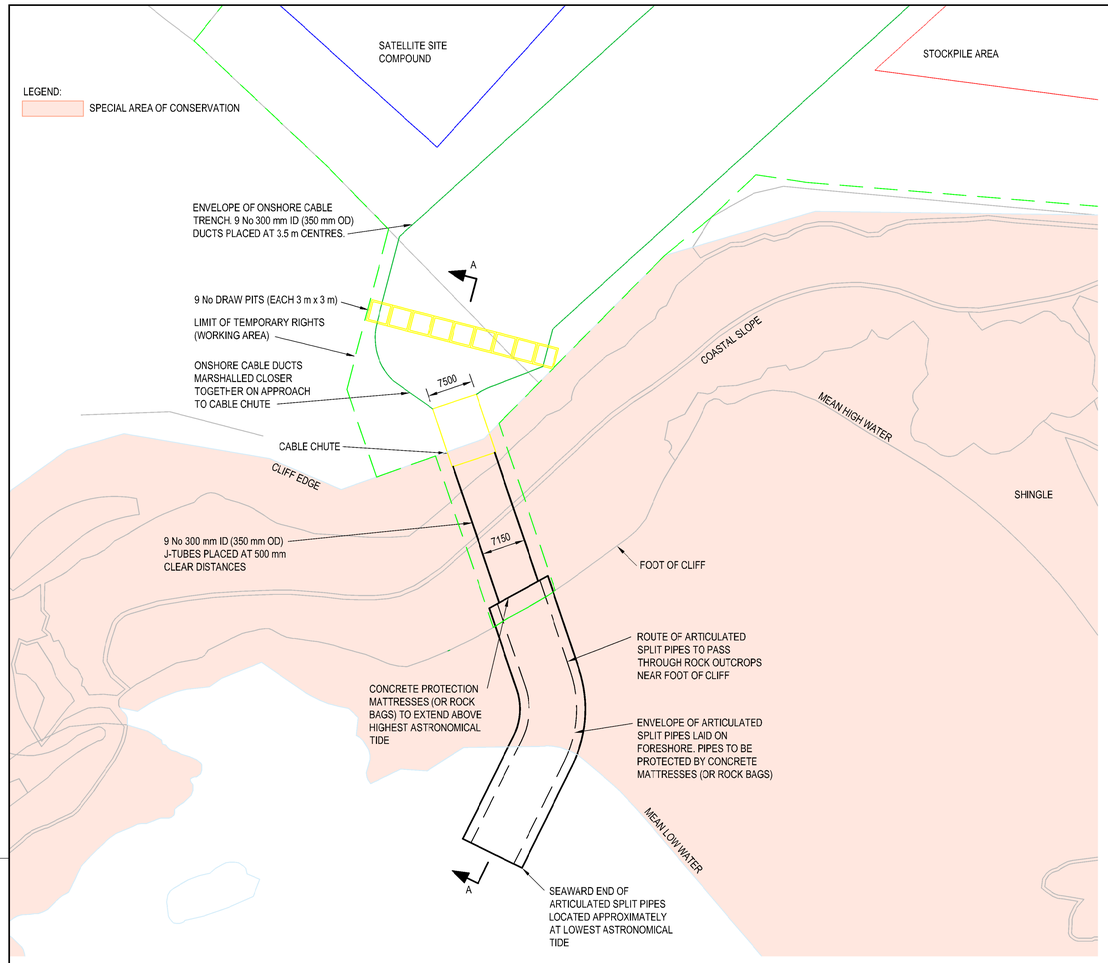
Black & Veatch Limited
60 High Street, Redhill, Surrey, RH1 1SH. United Kingdom
Tel: +44(0)1737 774155

Project
R12 MORLAIS DEVELOPMENT ZONE

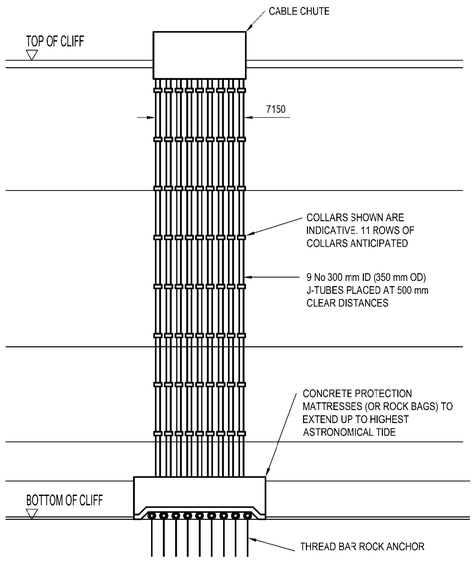
Drawing title
LANDFALL
TRENCH CABLE OPTION
CLIFF FACE ATTACHMENT

Drawing scale: AS SHOWN Sheet size: A1

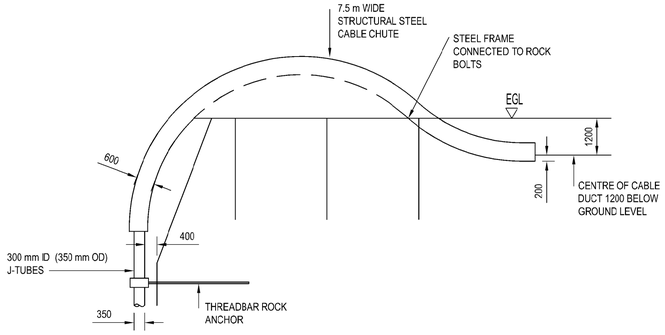
Drawing no. 122938-BVL-Z0-00-DR-C-00600 | Revision P02



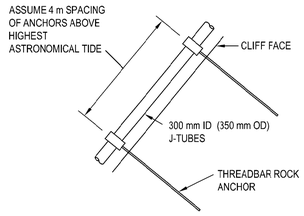
PLAN
SCALE 1:500



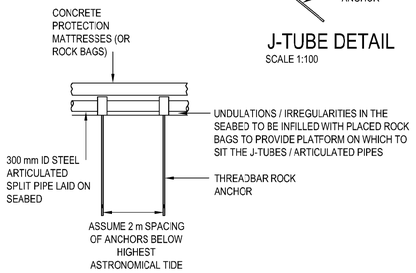
ELEVATION B
SCALE 1:250



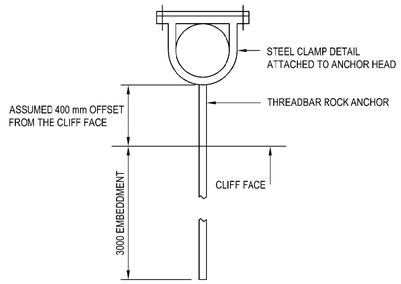
CABLE CHUTE DETAIL
SCALE 1:100



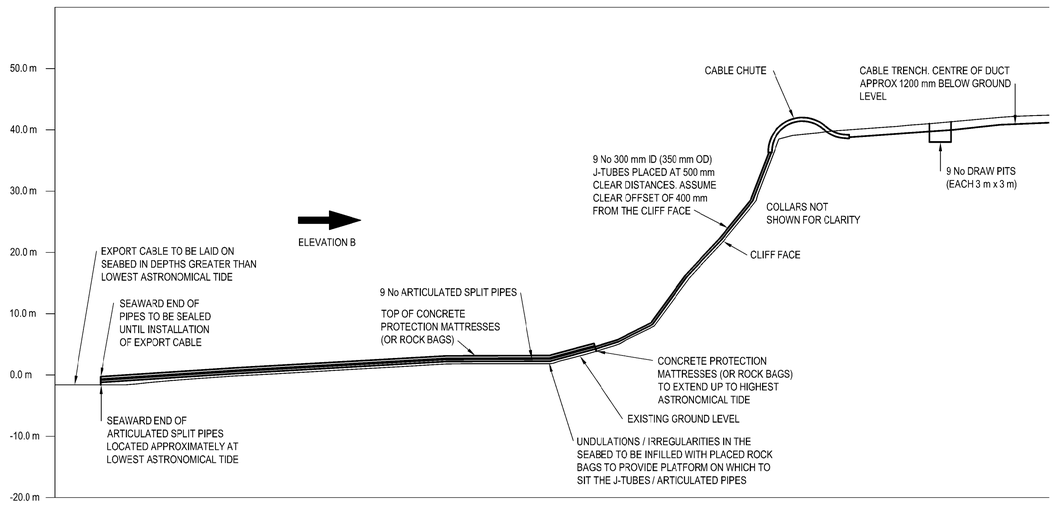
J-TUBE DETAIL
SCALE 1:100



SPLIT PIPE DETAIL
SCALE 1:100



CLAMP DETAIL
SCALE 1:20



SECTION A-A
SCALE 1:500

Note: The limits, including the height and depths of the Works, shown in this drawing are not to be taken as limiting the obligations of the contractor under Contract.

NOTES:

1. SCHEME ARRANGEMENT IS INDICATIVE.
2. SERVICES NOT SHOWN.
3. LOCATION OF BURIED CHAMBERS SUBJECT TO CHANGE.
4. INTERNAL DIMENSIONS OF BURIED CHAMBERS DEFINED.
5. J-TUBES AND ARTICULATED SPLIT PIPES TO BE HEAVY DUTY MATERIAL SUCH AS STEEL.
6. ID = INTERNAL DIAMETER, OD = OUTER DIAMETER.
7. PREDICTION OF HYDRODYNAMIC LOADS, STRUCTURAL DESIGN, GEOTECHNICAL DESIGN, SEDIMENT (E.G. INGRESS INTO, OR BURIAL OF, SEAWARD END OF SPLIT PIPES) AND STABILITY CALCULATIONS HAVE NOT BEEN CONDUCTED.
8. SPECIAL AREA OF CONSERVATION BOUNDARY LINES PROVIDED BY ROYAL HASKONING DHV.
9. CONNECTION BETWEEN CABLE CHUTE AND ROCK BOLTS SUBJECT TO FURTHER DESIGN STUDIES.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
IN ADDITION TO THE HAZARDS OR RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RESIDUAL RISKS SHOULD BE NOTED. FURTHER DETAILS ARE INCLUDED IN THE CDM DESIGN RISK MANAGEMENT REGISTER
CONSTRUCTION :
MAINTENANCE, CLEANING AND OPERATION :
DECOMMISSIONING OR DEMOLITION :

500mm 0mm 500mm 1000mm
Scale 1:20

4m 3m 2m 1m 0m 2m 4m
Scale 1:100

5m 0m 5m 10m 15m
Scale 1:250

10m 0m 10m 20m 30m
Scale 1:500

Rev	Drawn	Chkd	Rvwd	Apprvd	Date	Description
P01	MH	ALJ	TB	TB	22/01/20	
P02	MH	DM	ALJ	TB	13/02/20	ISSUED FOR INFORMATION
P03	MH	DM	ALJ	TB	25/03/20	0 0 0

Designed by: Date:

Status
S2 Suitable for Information

Client

MENTER MÔN

Client Drawing No. | Revision

BLACK & VEATCH

Black & Veatch Limited
60 High Street, Redhill, Surrey, RH1 1SH. United Kingdom
Tel: +44(0)1737 774155

Project
R12 MORLAIS DEVELOPMENT ZONE

Drawing title
LANDFALL
TRENCH CABLE OPTION
CLIFF FACE ATTACHMENT

Drawing scale: AS SHOWN Sheet size: A1

Drawing no. 122938-BVL-Z0-00-DR-C-00600 | Revision P03

BV PROJECT NUMBER :