

Lamby Way solar farm cable connection, Marine Licence Application: Supporting Information

A REPORT FOR WALTERS (UK) LTD
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Lamby Way solar farm cable connection, Marine Licence Application: Supporting Information

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Contents

1	Introduction	3
1.1	Report context	3
1.2	Proposed works.....	3
1.3	Consultations undertaken to date.....	4
1.3.1	Natural Resources Wales	4
1.3.2	Maritime and Coastguard Agency	4
1.3.3	Local Archaeological Trust	4
1.4	Scope of document.....	4
2	Environmental Setting.....	5
2.1	Protected sites	5
2.1.1	Habitat Regulations Assessment – Appropriate Assessment	6
2.2	Protected species.....	7
2.3	Geology	8
2.4	Archaeology.....	8
3	Working Method Statement.....	10
3.1	Roles and responsibilities	10
3.2	Working method.....	10
3.3	Environmental controls.....	11
3.3.1	Preventing noise and visual disturbance to/ displacement of overwintering birds 11	
3.3.2	Preventing changes of water quality within the EMS	13
3.3.3	Preventing habitat degradation as a result of air pollution	13
3.3.4	Preventing loss of habitat functionally linked to a European site (i.e. used by overwintering or passage birds for foraging.....	13
3.3.5	Waste and Arisings	14
3.4	Management and Storage of Fuel, Oil, Concrete and Chemicals.....	14
3.5	Monitoring	15
3.6	Emergency response	15

Tables

Table 2-1	Habitat and species features of the Severn Estuary EMS	5
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Table 2-2 SPA/ Ramsar site individual qualifying species recorded within the Rhymney Estuary and Great Wharf BTO WeBS count sector	7
Table 2-3 Summary of historical borehole logs	8
Table 3-1 Indicative noise attenuation estimates, directional drilling	12

Figures

- Figure P19121_R1_01 Site location plan
- Figure P19121_R1_02 Proposed Site layout plan
- Figure P19121_R1_03 Indicative drilling cross section

Appendices

- Appendix A: Report Conditions
- Appendix B: Correspondence with NRW Marine Licencing Team
- Appendix C: Correspondence with Maritime and Coastguard Agency
- Appendix D: Example Method Statement for Directional Drilling



1 Introduction

1.1 REPORT CONTEXT

Cardiff City Council (CCC) have received planning permission to create a solar electricity generation scheme on the Lamby Way landfill site in east Cardiff. It is intended that this be connected to the nearby Welsh Water Wastewater Treatment Facility on Rover Way, Cardiff in order that electricity generated can be directly provided to Welsh Water.

In order to connect the two sites, a new cable route is required. The preferred route for this is to run in a shallow buried duct on the landward side of Rover Way before crossing beneath both Rover Way and the River Rhymney, returning to the shallow sub-surface in the isthmus of land that extends across the mouth of the River Rhymney adjacent to the Lamby Way site.

In order to cross beneath the River Rhymney, a programme of directional drilling is proposed. As this work will pass beneath the tidal environment, a Marine Licence is required.

With the exception of the directional drilling aspect, all other works lie outside of the marine zone, above the Mean High-Water Strings (MHWS).

CCC have employed Walters (UK) Ltd (Walters) to undertake a process of design and implementation of the new cable route. As part of the design process, Walters have engaged Yellow Sub Geo to manage the process of collating and submitting an application for a Marine Licence. This report provides a suite of information in support of said application.

The solar farm to which this cable route forms an ancillary part was granted planning permission in 2019, CCC reference 19/00397/MJR). However, this cable route was not part of the development at that juncture, and so will require further planning permission. CCC are compiling a planning application for submission in due course.

Notwithstanding the above, many of the ecological assessments undertaken in support of the planning application for the solar farm also address the same issues that are salient to these additional cable installation works. In particular, a Habitats Regulation Assessment was undertaken by Arcadis (2019)¹.

1.2 PROPOSED WORKS

The proposed new cable route involves several aspects along its proposed alignment. This report only contemplates those works that affect the marine environment, namely those involved in the delivering directional drilling process only.

The launch and receiving pits for the drilling will both be above MHWS, with the borehole then being directionally drilled beneath the bed of the tidal river mouth between these two points. The two landward works areas will be securely fenced within a compound and managed as construction sites.

The site location is shown relative on Figure P19121_R1_01. The approximate proposed position of the planned launch and receiving pits are indicated on Figure P19121_R1_02. The approximate National Grid Reference of these two works compounds are:

- Launch pit: ST 22076 77596
- Receiving pit: ST 21818 77269

¹ Arcadis, 2019. Statement to inform an Appropriate Assessment. Version 3. April 2019



In broad terms, this work will comprise;

- Set-up of two works compounds, either side of the proposed river crossing route. The first of these is the drilling compound, the second is the receiving compound.
- Excavation of a pit in each location, providing the drilling rig with a suitable point of access and suitable point of exit from the sub-surface.
- Drilling of a small diameter (circa 500 mm) pilot bore along the proposed alignment, some 12 m beneath sea level at its deepest. See Figure P19121_R1_03 for indicative details.
- Once the drill string exits from the receiving pit, the drill head is swapped for a reaming head and the drill string drawn back through the pilot hole, reaming out to a larger diameter.
- As the reaming head is withdrawn, an HDPE borehole liner is drawn back through the borehole, providing the permanent casing to the borehole.
- Once the borehole liner is in place, two 150 mm HDPE ducts will be drawn through the borehole liner annulus, providing a duct for an 11kV electricity cable and a fibre-optic communications cable respectively.

1.3 CONSULTATIONS UNDERTAKEN TO DATE

Ahead of compiling this application for Marine Licence, a number of consultations have been undertaken. The details of this work are provided below:

1.3.1 Natural Resources Wales

The Natural Resources Wales (NRW) Marine Licensing team were approached for their advice on the most appropriate format for the application. This correspondence is included in Appendix B to this document. The upshot of this was that a Band 2 Marine Licence was stipulated by NRW as the most appropriate approach.

1.3.2 Maritime and Coastguard Agency

The Maritime and Coastguard Agency were approached to ascertain whether they had any concerns with respect to the proposed works. They provided a response confirming no objection to the proposed works in an email dated 29th July 2019. This email is provided in Appendix C to this document.

1.3.3 Local Archaeological Trust

Glamorgan and Gwent Archaeological Trust were contacted with respect to the proposed works. To date, no response has been received.

1.4 SCOPE OF DOCUMENT

This document summarises the environmental setting of the proposed directional drilling works, including discussion of the ecological environment largely based on the considerable body of work undertaken in support of the planning application for the Lamby Way solar farm. It then describes the proposed works method statement for the drilling works, including environmental mitigation measures.

This report should be read in conjunction with the completed NRW form titled Application for a Licence to Undertake Marine Energy Works, to which it is a supporting document.



2 Environmental Setting

The proposed area of directional drilling and associated surface works compounds has been assessed by CSM Ecology. The following paragraphs are based on both this report and on the considerable body of ecological assessments and surveys compiled in the application and determination of the planning permission for the Lamby Way solar farm development.

2.1 PROTECTED SITES

The marine area of the Severn Estuary is designated as the Severn Estuary Special Area of Conservation (SAC) and is also is designated a Special Protection Area under the 'EEC Wild Birds Directive' and a Wetland of International Importance under the Ramsar Convention. The estuary is therefore designated at international level due to its importance as a marine and intertidal habitat. For simplicity, these designations are referred to herein as the Severn Estuary European Marine Sites (Severn Estuary EMS). The qualifying habitats and assemblages of the Severn Estuary EMS are summarised below:

Table 2-1 Habitat and species features of the Severn Estuary EMS

SAC Habitat Features	Estuaries;
	Mudflats and sandflats not covered by seawater at low tide;
	Atlantic salt meadow (<i>Glauco-Puccinellietalia maritima</i>).
	Sandbanks which are slightly covered by sea water all the time
	Reefs
SAC Species Features	Sea lamprey <i>Petromyzon marinus</i>
	River lamprey <i>Lampetra fluviatilis</i>
	Twaite shad <i>Alosa fallax</i>
Severn Estuary Special Protection Area (SPA)	Internationally important populations of the Annex 1 species Bewick's Swan
	Internationally important populations of regularly occurring migratory species (Gadwall, Shelduck, Redshank, Dunlin and European White-Fronted Goose).
	The site also qualifies as an SPA since it regularly supports in excess of 60,000 waterfowl during the winter. The species listed include Wigeon, Teal, Pintail, Pochard, Tufted Duck, Ringed Plover, Grey Plover, Curlew, Whimbrel, Spotted Redshank, Mallard, Lapwing and Shoveler.
Severn Estuary Ramsar Site	Estuaries
	Assemblage of migratory fish species
	Bewick's swan
	European white-fronted goose
	Dunlin
	Redshank
	Shelduck
	Gadwall
	Assemblage of waterfowl



The landward boundary of the Severn Estuary EMA sites lies along the MHWS line. The proposed directional drilling works and associated surface works compounds lie entirely outside of (i.e. landward of) this boundary. The works will not therefore physically impact on the protected site. Any impact that may occur is limited to that associated with any substances, noise, dust or other pollution that might emanate from the proposed works.

2.1.1 Habitat Regulations Assessment – Appropriate Assessment

Under Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017, referred to as the 'Habitats Regulations', a competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which...

- a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and;
- b) is not directly connected with or necessary to the management of that site;

...must make an Appropriate Assessment of the implications for that site in view of that site's conservation objectives. In the light of the conclusions of the assessment, the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site.

Due to its proximity to the Severn Estuary EMS and the adjudged potential for the development to impact on the EMS, the Lamby Way solar farm development was subject to Appropriate Assessment under these Regulations. The Appropriate Assessment was undertaken by Natural Resources Wales as competent authority (NRW, 2019²), based in part on data gathered by Arcadis on behalf of CCC (Arcadis, 2019 & Arcadis, 2019a³).

The potential impacts on the EMS identified during this process included:

1. Direct habitat and species loss associated with European sites.
2. Habitat degradation as a result of increased air pollution.
3. Changes in water quality within the European sites.
4. Loss of habitat functionally linked to a European site (i.e. used by overwintering or passage birds for foraging).
5. Disturbance/ displacement to species using the adjacent Rhymney River and Severn Estuary.

The potential for direct habitat loss (1) and loss of habitat functionally linked to a European Site (4) were deemed unlikely to be significant for the solar farm. For all other potential impacts, a programme of mitigation measures were proposed by CCC and were incorporated into the conditions placed upon the planning permission.

In order to provide consistency of approach, the same mitigation measures shall be employed in the delivery of the directional drilling works. Given the proposed works fall entirely outside of the EMS, the potential for (1) is considered to remain unlikely and is not considered further. All the other four factors are considered further in the Working Method Statement and associated mitigation measures as detailed in Section 3 of this document.

² NRW, 2019. Habitats Regulations Appraisal: Severn Estuary Special Protection Area (SPA), Special Area of Conservation (SAC), and Wetland of International Importance (Ramsar Site). Application No:19/00397/MJR. Proposal: Installation of a ground-mounted photovoltaic solar farm and ancillary development

³ Arcadis, 2019a. Lamby Way Solar Farm HRA – Redshank Roost Update. Arcadis, April 2019.



2.2 PROTECTED SPECIES

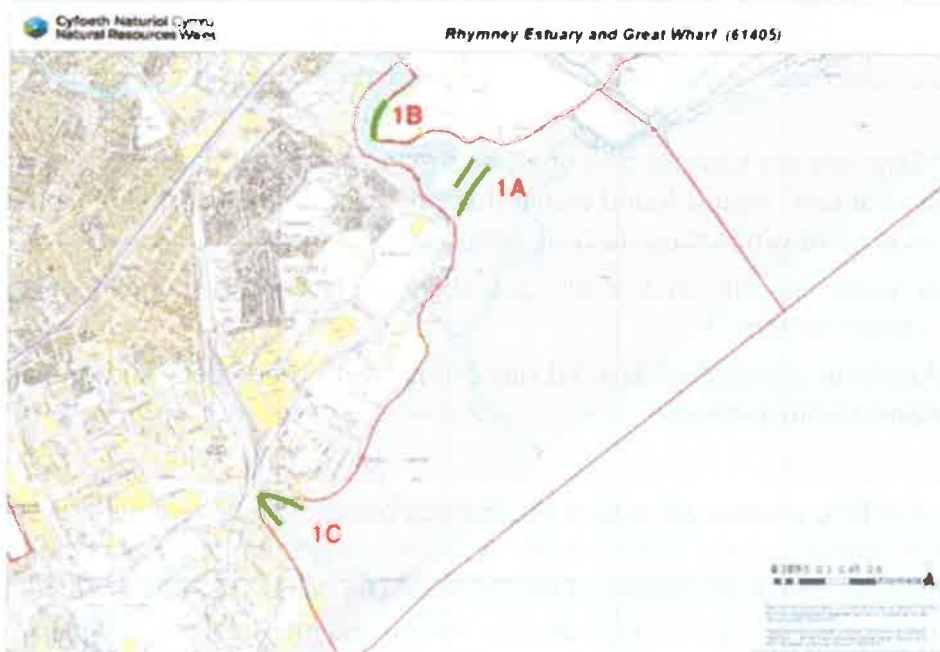
During the course of the Habitats Regulations Assessment for the solar farm, data was gathered on the use of the River Rhymney estuary and the stretch of the Severn Estuary foreshore that abuts the proposed directional drilling eastern compound. Of particular salience is the results of British Trust for Ornithology WeBS monitoring scheme for the stretch of foreshore that includes the Rhymney estuary. The results of this are summarised in the following table:

Table 2-2 SPA/ Ramsar site individual qualifying species recorded within the Rhymney Estuary and Great Wharf BTO WeBS count sector

Species	5 yr average (2012/13 – 2016/17)
Ringed plover (on passage)	9
Curlew	4
Dunlin	1500
Pintail	155
Redshank	1167
Shelduck	428
Gadwall	9
Lesser black-backed gull (breeding only)	37
Teal	41

In undertaking their Appropriate Assessment for the solar farm, NRW place particular importance on the Dunlin and Redshank numbers, which represent an estimated 3.5% and 50% of the overall Severn Estuary overwintering population. Arcadis (2019a) detailed the presence of three roost sites for this Redshank and Dunlin population, as detailed in the following figure:

Figure 2-1 Redshank and Dunlin roost sites, Great Wharf and Rhymney Estuary.



Of these, Roost 1A is situated on the foreshore immediately adjacent (within 30 m of) the proposed eastern works compound.

2.3 GEOLOGY

The British Geological Survey (BGS) 1:50,000 scale mapping indicates the area of the proposed works to be underlain by superficial clay, silt and sand of the Tidal Flat Deposits. This is shown as underlain by the solid geology of the Mercia Mudstone Group mudstones beneath. The experience of Yellow Sub Geo working in the Cardiff and Newport area suggests that a water-bearing layer of superficial gravels can be expected to be present between these two units.

This anticipated sequence of clays/ gravels/ mudstones is confirmed by four historic borehole records held by the BGS, as summarised in the following table:

Table 2-3 Summary of historical borehole logs

BGS ref.	borehole	Approx. location	Depth range (mbgl)			
			Tidal Deposits	Flat	Superficial gravels	Mercia Mudstone
ST27NW 38		On landfill area, adjacent to shore NE of proposed works	Ground level to 8.2		8.2 to 10.6	>19.8
ST27NW 550		On landfill area, adjacent to shore NE of proposed works	Ground level to 10.1		10.1 to >10.8	Not proven
ST27NW 43		South shore of river, east of proposed works	Ground level to 12.2		12.2 to 14.6	>18.3
STNW27 95		South of Rover Way, west of proposed drilling pit	Ground level to 13.8		Not recorded as present*	>24

The Tidal Flat Deposits are typically described on the logs as a soft dark grey silty clay with variable organic content. Peat is found within these deposits in the Cardiff area, but has not been logged as present within these historic boreholes.

The superficial gravel deposits are typically described as grey-brown rounded clayey gravel with variable cobble content.

The Mercia Mudstone is described as a red clay or marl, with green beds and green patches and with localised calcitic patches.

2.4 ARCHAEOLOGY

The directional drilling process will extend downwards beneath the River Rhymney at depths up to 12 metres below current ground level. It is anticipated that any archaeology will be constrained to within the upper metres of the Tidal Flat Deposits. The bore alignment will be beneath the base of these deposits beneath the marine and intertidal areas, and as such will



Lamby Way solar farm cable connection, Marine Licence Application:
Supporting Information

only have potential to interact with archaeology in the vicinity of the drilling pit and receiving pit.

The Glamorgan and Gwent Archaeological Trust have been contacted (initially by telephone, followed by email dated 23rd July 2019) with a request for their opinion on the potential impact of the proposed works on archaeology. Their response is awaited.



3 Working Method Statement

3.1 ROLES AND RESPONSIBILITIES

The works to be undertaken in delivering the directional drilling will be undertaken by Walters (UK) Ltd as Principal Contractor. Walters will self-deliver the above-ground aspect of the works and will subcontract the drilling works to a specialist directional drilling company (with the precise company being subject to appointment). Walters are employing CSM Ecology to provide advice as to the required precautions and methods to protect the ecological environment in which the works are to be undertaken. They are employing Yellow Sub Geo as environmental co-ordinator responsible for the collation of the Marine Licence Application.

3.2 WORKING METHOD

Welfare facilities, site compounds and access roadways will be set up as part of the overarching cable construction and installation works, which will extend over a much larger distance and footprint than will the works associated with the directional drilling. These facilities and compounds will be positioned away from the foreshore area and hence are not relevant to the Marine Licence Application..

The construction process associated with the directional drilling operation will consist of the following operations:

- Mobilisation of ancillary plant and equipment (excavators).
- Strip of topsoil in each compound area, with topsoil stockpiled for replacement upon completion of the works. Topsoil bunds will be positioned to provide a visual and acoustic barrier between the works and the Severn Estuary.
- Erection of temporary acoustic barriers around the eastern compound, where topsoil bund does not provide sufficient (2 m high) barrier.
- Creation of a working platform using a membrane and quarried aggregate
- Excavation of a drilling and receiving pit in each compound respectively. Soils arising from this excavation will be used to form a visual and acoustic barrier between the works and the Severn Estuary and River Rhymney, where space allows. Excess soil will be exported for storage elsewhere within the works area for later use in re-instatement.
- Mobilisation of directional drilling rig and associated plant and equipment, including water tanks, water pumps and recirculation equipment.
- Positioning of drilling equipment within the excavated pits.
- Operation of the drilling process and installation of HDPE borehole liner in accordance with the example method statement in Appendix D.
- Transfer of drilling arisings into trucks as it is generated, for export from site under suitable Waste Carrier's Licence and Duty of Care.
- Installation (pulling through) of HDPE ducting within borehole liner.
- Installation of (pulling through) of 11 kV cable and fibre optic cable into ducts.
- Demobilisation of drilling plant and equipment.
- Backfill and reinstatement of soil from excavation pits.
- Excavation and removal from site of placed aggregate and membrane from working platform.
- Removal of temporary acoustic barriers.
- Replacement of topsoil.



3.3 ENVIRONMENTAL CONTROLS

3.3.1 Preventing noise and visual disturbance to/ displacement of overwintering birds

3.3.1.1 Visual impact

Due to the close proximity to the foreshore (30 m or less) and due to the open nature of the saltmarsh in this area, visual impact of the eastern works compound during the 3 to 5 week work period will be unavoidable. The topsoil stripped from the works compound will be used as a visual bund on the foreshore side of the works, and the perimeter will be secured using a temporary acoustic barrier, which will also provide visual a screening at least 2 m in height. This will minimise visual impact once the works compound is constructed. Some impact will nonetheless remain during the short working period.

Upon completion of the works, there will be no remaining visual impact as the topsoil will be replaced and the vegetation allowed to regenerate.

In recognition of the importance of the foreshore to the Redshank and Dunlin population of the Severn Estuary EMS, no work shall be undertaken east of the River Rhymney between October and March, thus avoiding the period when these birds will be using the estuary in close proximity to the eastern works compound.

In contrast, the western works compound is on the opposite side of Rover Way to the foreshore. There is an existing soil bund between Rover Way and the foreshore which prevents direct visibility of the road from the estuary. Hence the western compound will be distant from, and not visible from the estuarine environment. Hence works may be underway to the west of the River Rhymney during the October to March period, if required by the programme.

3.3.1.2 Noise

Noise is highlighted within the Marine Licence Application guidance document published by NRW as being of importance when considering impact on marine habitats, particularly the Severn Estuary EMS. As such, the noise associated with the proposed directional drilling works must be considered with respect to its potential to impact on the EMS and the species dependent upon it. Further still, noise and visual disturbance to overwintering birds was highlighted as a critical consideration by NRW in their Appropriate Assessment of the solar farm development.

Of equal importance in any consideration of noise impact associated with the proposed drilling works is the setting of the proposed works. Rover Way, which flanks the western bank of the River Rhymney, is a main arterial road in south-east Cardiff, and carries heavy traffic throughout the day. Rover Way runs through a heavy industrial area of Cardiff, with a large steelworks and numerous other industrial installations lining the road on either side, some 500 m west of the proposed drilling works.

In order to ascertain the current noise levels along the Rover Way corridor, a search of the CCC planning portal was undertaken in order to identify whether a noise survey had already been undertaken on the road, in support of previous planning applications in the area. A Noise Impact Assessment report written by TNEI Group (TNEI, 2019)⁴ has recently been

⁴ TNEI Group, 2019. Noise Impact Assessment. Asphalt Plant, Rover Way, Celsa Site. Version R2, July 2019



submitted in support of a planning application for an asphalt plant within the wider steelworks complex. This report summarises a programme of noise monitoring which included a monitoring point immediately adjacent to Rover Way, some 100 m west of the proposed drilling pit works compound. This recorded noise levels at various times during the week over a period in May 2019 and included both Sunday and weekday monitoring. The ambient average sound levels were recorded to vary between 70 dB and 75 dB.

This data was gathered on the same stretch of Rover Way as passes the proposed works site, with no junctions in between. As such, the level of noise generated by the traffic on this road, as measured in the study, can be considered representative of that which can be expected immediately adjacent to the River Rhydney.

Noise generated by the directional drilling process beneath rivers has been studied by previous assessments (e.g. Stantec 2012⁵), with the consistent conclusion that the drilling process, including drill rig, excavators, pumps and other ancillary plant, can be expected to generate noise in the region of 100 to 120 dB.

The eastern works compound, on the isthmus in the mouth of the river, is approximately 30 m from the SAC/ SSSI boundary. The western works compound lies over 50 m from the SSSI/ SAC boundary, with the busy Rover Way in between.

The Sound Propagation Level Calculator (MAS Environmental 2019⁶) has been used to estimate the degree to which the noise generated will be attenuated over distance as detailed in the following table:

Table 3-1 Indicative noise attenuation estimates, directional drilling

Noise generated at point source (drill/ receiving compound)	Resulting sound pressure level (dB)		
	50 m from source	30 m from source	30 m from source with 2 m temporary acoustic barrier
100	58	62	54
120	78	82	74

The values in the above table do not take account of the fact that the drilling rig will be sat within a drilling pit, and so horizontal noise propagation will be reduced further.

Whilst the above table should be viewed as indicative only, it suggests that the western drilling compound will create a similar sound pressure level at the SSSI/ SAC boundary as is already generated by Rover Way, to which local wildlife will have already become habituated.

A temporary acoustic barrier around the eastern works compound is indicated to be sufficient to keep sound levels to a similar level to that generated by Rover Way (and hence remain within the range to which local wildlife has become habituated).

This, coupled with a lack of winter working in the eastern compound area and the short duration of the proposed works are considered to reduce the noise impact such that it will not affect the species of the adjacent EMS.

⁵ Stantec, 2012. Noise impact study – horizontal directional drilling for Bluewater River crossing replacement project. Stantec Consulting Ltd., 2012.

⁶ MAS Environmental, 2019. Sound propagation Level Calculator (Version 3.1). www.masenv.co.uk



All activities associated with the construction of the project will be undertaken with the 'best practical means' as defined in the Control of Pollution Act 1974 and in accordance with British Standard 5228, 2009: Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 – Noise. In accordance with the above indicative assessment, no special precautions are considered necessary in the western works compound, due to its isolation from the SSSI/ SAC by Rover Way. The eastern works compound shall be surrounded by a topsoil bund and/ or a 2 m high temporary acoustic barrier.

Such procedures for noise control in respect of construction activities will be put in place, monitored and reviewed throughout the works period.

3.3.2 Preventing changes of water quality within the EMS

3.3.2.1 Management of run-off

In order to protect water quality of the River Rhymney and Severn Estuary during the construction phases of the development from potential pollution incidents, or run off from the construction site, a Surface Water Management Plan will be compiled and adhered to throughout the works. This will include water quality protection measures that comprise best practices and measures as set out within relevant CIRIA publications, such as:

- undertaking regular checking of waterbodies located near areas of construction works for changes in water quality;
- avoiding spillages by using bunds around storage tanks to prevent leakages,
- use of drip trays around mobile plant,
- designating specific areas for re-fuelling to prevent run off; and
- use of grips, sumps, straw bales and sediment trap to capture silt, if required.

The drilling process uses water as the flush. No additives shall be used, ensuring that the flush media remains simply sediment-laden water. The flush system remains fully contained within a tanked system, so preventing run-off outside of the works compound. Drilling-flush water will be disposed of by lorry at an off-site facility upon completion of the works.

It is anticipated that the above control measures will be required by a planning condition.

These measures shall be designed, implemented and their efficacy monitored throughout the works period. This is considered sufficient to prevent the construction activities causing any changes in water quality within the EMS.

3.3.3 Preventing habitat degradation as a result of air pollution

The works are anticipated to take approximately 3 to 5 weeks. Given this limited duration and given the semi-industrial context within which the works sit, no special measures are considered necessary to protect the Severn Estuary EMS from air pollution. No habitat degradation is considered likely to occur as a result of air pollution from the works.

3.3.4 Preventing loss of habitat functionally linked to a European site (i.e. used by overwintering or passage birds for foraging)

The land upon which the western compound is to be sited is within an area of derelict brownfield land which is not considered to be functionally linked to the EMS and no special mitigation is planned for this compound. The land upon which the eastern compound is to be situated lies immediately inshore of the tidal saltmarsh, in an area of rough grassland. This land may be used by overwintering birds for grazing (less likely due to the high sward) roosting and foraging.



No works are to be undertaken in the eastern compound in the period October to March. This ensures no loss of functionally linked habitat during the overwintering period.

During the period of the works, the works compound shall be stripped of topsoil. Upon completion of the works some 3 to 5 weeks later, the topsoil shall be replaced and the natural vegetation allowed to regenerate. It is intended that the works will be undertaken in Spring 2020 and as such there will be a full growing season to enable regeneration of vegetation ahead of the subsequent overwintering season. This is considered sufficient to ensure no loss of habitat that is functionally linked to the EMS.

3.3.5 Waste and Arisings

All waste generated by the directional drilling project, including the arisings generated by the drilling process, will be disposed of off-site at a licensed waste handling facility, transported under an appropriate Waste Carriers Licence.

Waste segregation will be employed at the point of creation in order to maximise the re-use and recycling of materials. Where opportunities arise (for example, for re-use of natural soil arisings on nearby construction sites (under a CL:AIRE Definition of Waste: Development Industry Code of Practice approach or similar), materials arising from the works shall be diverted away from the waste stream under appropriate permits and permissions.

Under no circumstances will any soils or other waste materials be left on site, nor will they be placed within the marine environment.

3.4 MANAGEMENT AND STORAGE OF FUEL, OIL, CONCRETE AND CHEMICALS

Fuel storage will be located within the plant storage area and be positioned to allow safe access and maintenance. The tank(s) will be positioned to minimise the risk of damage by impact. Diesel fuel will be stored in an appropriately sized storage tank(s), designed specifically for the storage of fuel. The tank(s) shall also be surrounded by an oil tight bund, which shall have a storage volume of a minimum of 110% of the capacity of the diesel tank under which it sits.

Leaks will be constantly monitored by trained operatives. All dispensers will comply with BS EN13617.

To prevent theft and vandalism, lockable valves will be fitted on all storage tanks, fences will be secure, and doors and gates kept locked.

The surface of the area where deliveries are made, and oil is dispensed, shall be protected by an impermeable surface and isolated from surface water drainage systems. This shall comprise an impermeable polypropylene liner covered in 300mm graded stone with the liner upturned at the circumference hence providing an impermeable catch-pit. This will minimise the risk of spilt oils causing pollution.

Plant which needs to be re-fuelled on site during the day, will be refuelled by a self-contained diesel bowser, towed to the point of need, with a suitable vehicle. No mobile refuelling will take within 30m of the estuary or foreshore.

Small plant such as pumps or generators shall be refuelled using jerry cans and appropriate funnels. Refuelling will be carried out over a drip tray. The small plant will be sited over drip trays during operation. Jerry cans and other fuel containers shall be stored in a secured fuel container within the compound.

As a general rule, at the end of the day all plant shall track back to the plant storage compound where it will be refuelled. A spill kit shall be held locally to the plant.

An emergency spill plan will be prepared and adopted by all site users. All site operatives shall be made aware of the spill plan via the site induction. As a minimum, all refuelling areas will have spill kits available and there will be competent individuals employed to use them. Used spill kits will be disposed in the appropriate manner to avoid contamination. Management and storage of fuel and oil will be carried out in accordance with:

- PPG 7: The Safe Operation of Refuelling facilities
- PPG 6: Working at Construction and Demolition Sites
- PPG 8 Safe Storage and disposal of used oils

3.5 MONITORING

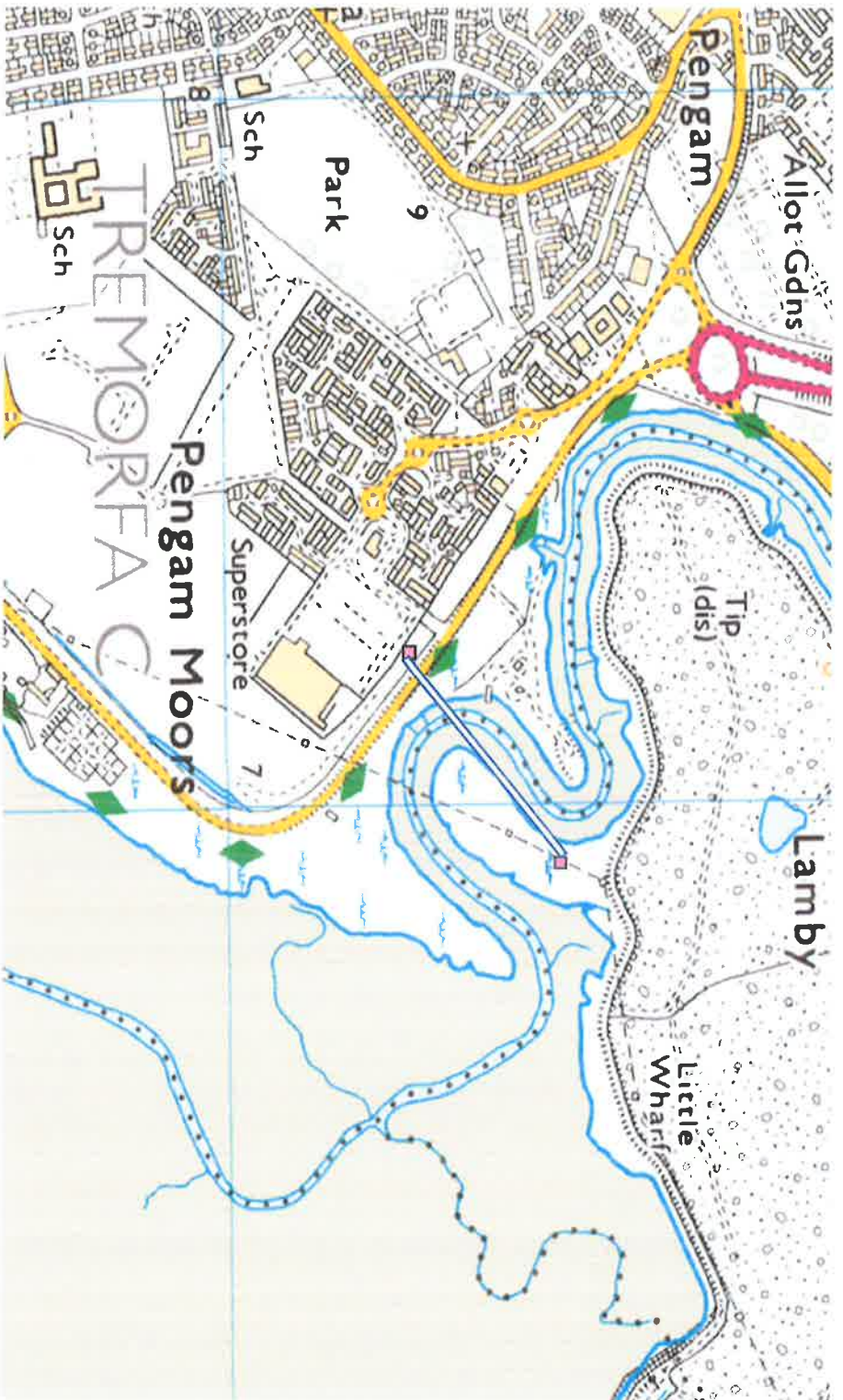
A dedicated water management team will be responsible for inspecting and maintaining all water management and control measures. A rigorous inspection regime shall be established, and all surface water protection measures will be inspected on a frequent basis. Inspections will identify areas that need improvement and will identify any significant breaches requiring immediate attention.

During site operations the periphery of the works compounds will be observed. Photographs will be taken during wet and dry periods and maintained for record purposes. The monitoring of the compound periphery will typically be carried out weekly but increased as deemed necessary dependent on the site conditions. Monitoring will be recorded on a check sheet together with a record of weather conditions. The observations are designed to gain an understanding of the existing site conditions and surrounding environmental setting and to become aware of any implications of the works on the surrounds, if occurring.

3.6 EMERGENCY RESPONSE

An emergency environmental procedure shall be developed and implemented in cases of pollution. A nominated emergency contact will be appointed, and their details will be displayed on site notice boards. The emergency contact details for National Resources Wales will also be displayed. The emergency procedures will be explained during induction and a copy will be displayed on all site notice boards.



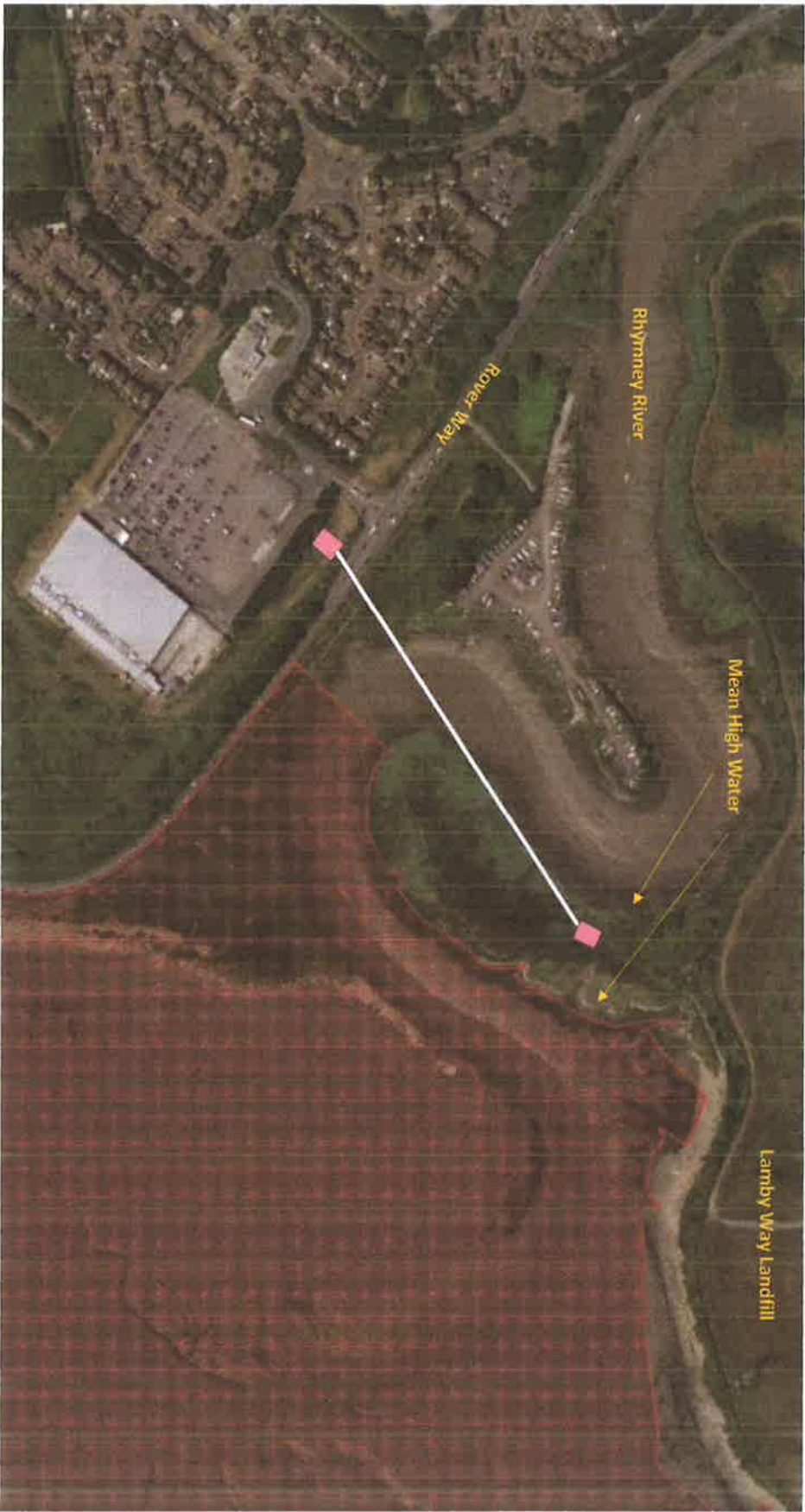


KEY:

Approximate drill pit compound locations

Approximate alignment of bored tunnel

 7 Neptune Court, Vanguard Way, Cardiff, CF24 5PJ help@yellowsubgeo.com	Drawing Title		Site Location Plan		Scale		NTS	
	Drawing Number		P19121_R1_D01		Revision		0	
	Project Name		Cable connection, Lamby Way Solar		Drawn by		GRO	
	Project Number		P19121		Checked by		ACE	
Client		Walters UK Ltd		Notes		All locations approximate only		



KEY:

Approximate drill pit compound locations

Approximate alignment of bored tunnel

Severn Estuary SAC

 7 Neplune Court, Vanguard Way, Cardiff, CF24 5PJ info@yellowsubgeo.com	Drawing Title		Proposed site layout plan		Scale		NTS		
	Drawing Number		P19121_R1_D02		Revision		0		
	Project Name		Cable connection, Lamby Way Solar		Drawn by		GRO		
	Project Number		P19121		Checked by		ACE		
	Client		Walters UK Ltd		Notes		All locations approximate only		

Appendices



Appendix A: Report Conditions



Report Conditions

This report has been prepared by Yellow Sub Geo Ltd. (Yellow Sub Geo) in its professional capacity as soil and groundwater specialists, with reasonable skill, care and diligence within the agreed scope and terms of contract and taking account of the manpower and resources devoted to it by agreement with its client, and is provided by Yellow Sub Geo solely for the internal use of its client.

The advice and opinions in this report should be read and relied on only in the context of the report as a whole, taking account of the terms of reference agreed with the client. The findings are based on the information made available to Yellow Sub Geo at the date of the report (and will have been assumed to be correct) and on current UK standards, codes, technology and practices as at that time. They do not purport to include any manner of legal advice or opinion. New information or changes in conditions and regulatory requirements may occur in future, which will change the conclusions presented here.

Where necessary and appropriate, the report represents and relies on published information from third party, publicly and commercially available sources which is used in good faith of its accuracy and efficacy. Yellow Sub Geo cannot accept responsibility for the work of others.

Site investigation results necessarily rely on tests and observations within exploratory holes only. The inherent variation in ground conditions mean that the results may not be representative of ground conditions between exploratory holes. Yellow Sub Geo take no responsibility for variation in ground conditions between exploratory positions.

This report is confidential to the client. The client may submit the report to regulatory bodies, where appropriate. Should the client wish to release this report to any other third party for that party's reliance, Yellow Sub Geo may, by prior written agreement, agree to such release, provided that it is acknowledged that Yellow Sub Geo accepts no responsibility of any nature to any third party to whom this report or any part thereof is made known. Yellow Sub Geo accepts no responsibility for any loss or damage incurred as a result, and the third party does not acquire any rights whatsoever, contractual or otherwise, against Yellow Sub Geo except as expressly agreed with Yellow Sub Geo in writing. Yellow Sub Geo reserves the right to withhold and/ or negotiate the transference of reliance on this report, subject to legal and commercial review



Appendix B: Correspondence with NRW Marine Licencing Team



Gareth Owen

From: Marine Licensing <marinelicensing@cyfoethnaturiolcymru.gov.uk>
Sent: 31 July 2019 15:37
To: Gareth Owen
Cc: Rhodri Hughes; Dai Thomas
Subject: RE: Q19068 Marine Licence enquiry, mouth of River Rhymney, Cardiff

Q19068

Good afternoon Gareth,

Thank you for your email.

To clarify there is not an application process for exemptions only a condition relating to the bored tunnel that the marine licensing must be notified of the activity. As part of this notification process we would not provide approval, or consult to determine whether we agreed that the works would not pose adverse effect on the welsh environment. Should you look to rely on the exemption you must satisfy yourselves that the works will not pose adverse effect on the environment. As discussed below we usually recommend that a marine licence is sought to cover both activities due to the difficulty in ruling out adverse effect.

Band 1 projects are usually restricted to projects which have been listed within the band 1 guidance document, these activities have been pre consulted upon with our advisors and relevant conditions included within the band 1 licence. If an activity is not listed within the guidance document then it is unlikely that we would consider it band 1. In exceptional circumstances where it is clear there is no impact pathway with the marine environment or the activity is similar in nature to a band 1 listed activity we may include activities that are not listed, I am not aware of the methods or potential impact that may arise from deposit of a cable however from your email below as you are suggesting that an environmental assessment will be required to determine the impact of deposit of the cabling, if the works require an environmental assessment this suggest there is a potential impact pathway with the marine environment from the deposit of the cable, if this is the case its unlikely band 1 may not be appropriate.

For clarity we would not consider a bored tunnel as band 1 therefore if there is potential or uncertainty surrounding whether there may be adverse effect on the environment we would ask you submit a band 2 application.

Band 2 application are used for a wide range of project which vary in scale and potential impact, therefore would be appropriate for activities that do not fall within the band 1 guidance document.

As you note our service level for band 2 application is 4 months, in many cases these are determined prior to this, however we would not be able to confirm or agree any shorter time frame.

Kind regards

Pete

Trwyddedu Morol/ Marine Licensing
Cyfoeth Naturiol Cymru / Natural Resources Wales

www.cyfoethnaturiol.cymru / www.naturalresources.wales

Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.

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Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay

From: Gareth Owen <gareth@yellowsubgeo.com>

Sent: 26 July 2019 16:36

To: Marine Licensing <marinelicensing@cyfoethnaturiolcymru.gov.uk>

Cc: Rhodri Hughes <RhodriHughes@walters-group.co.uk>; Dai Thomas <DaiThomas@walters-group.co.uk>

Subject: RE: Q19068 Marine Licence enquiry, mouth of River Rhymney, Cardiff

Good afternoon Pete,

Many thanks for your prompt response, which is much appreciated. I will revert back to our client on the matter, but a few points for clarification immediately come to mind:

Firstly, I appreciate your points highlighting the risk that, were we to undertake the boring under an exemption and to cause an adverse effect, our client may be liable to enforcement action. I will discuss this with our client. In the event that we chose to undertake the tunnel boring under exemption, am I correct in interpreting your response as indicating that we would need a Band 2 Licence for the cable deposition activity in any case?

Secondly, in practice we anticipate that the quality and content of supporting information we will need to submit will be similar (albeit supporting different application forms) whether an exemption, Band 1 or Band 2 apply (due to the need to demonstrate no adverse effect to the sensitive environment). We were however hoping that a Band 1 Licence may be acceptable based on the scale and type of the work, as the mention of deposit of cabling in the Band 2 documentation would seem to be associated with marine energy projects, and hence would not seem to apply to this project?

Thirdly, there is a significant difference in timescales for NRW review and response between the Band 1 and Band 2 routes. Based on the fact that you advise the Band 2 route, the 16 week response period puts our proposed programme at risk. Assuming that a Band 2 application is made, is there a possibility that this may be turned around quicker than this, or are you typically working to the 16 week period at present?

Many thanks for your help in the matter – I look forward to hearing from you.

Kind regards,

Gareth

Gareth Owen

Director

E: gareth@yellowsubgeo.com

T: 07572 070 798

W: www.yellowsubgeo.com



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From: Marine Licensing <marinelicensing@cyfoethnaturiolcymru.gov.uk>

Sent: 26 July 2019 14:37

To: Gareth Owen <gareth@yellowsubgeo.com>

Cc: Rhodri Hughes <RhodriHughes@walters-group.co.uk>; Dai Thomas <DaiThomas@walters-group.co.uk>

Subject: Q19068 Marine Licence enquiry, mouth of River Rhymney, Cardiff

Q19068

Good afternoon Gareth,

Thank you for contacting the marine licensing team.

As you have noted there is an exemption for bored tunnels as detailed in section 31 of the Marine Licensing (Exempted Activity) (Wales) Order 2011 [here](http://legislation.gov.uk) [\[legislation.gov.uk\]](http://legislation.gov.uk) however a condition of this exemption is that the works does not cause an impact to the environment of Wales.

If there is any possibility that the works may have an adverse impact, for example noise, and vibrations through creating the bored tunnel impacting on birds, or migratory fish, then the exemption would not be applicable.

I note that you recognise that the works may have an impact on the environment due to the sensitive nature of the site and intend to submit an ecological assessment to be submitted with the notification. For clarity if you intend to rely on the exemption you must satisfy yourselves that the works will not pose an adverse effect to the environment, approval of your conclusion of the report is not part of the exemption process. Should you require comment on your report I would advise that you contact marine.area.advice@cyfoethnaturiolcymru.gov.uk who will be able to provide advice on potential impacts, this advice may be chargeable.

I would also highlight as the exception is only applicable if you do not adversely affect the Welsh environment if you did choose to rely on the exemption and any impact was caused by the works then the exception would not apply and in that instance the works would then be taking place without consent risking enforcement action.

As it is difficult to rule out impact, and based on the comments above our general advice is that you apply for a band 2 application that would cover the bored tunnel and the subsequent deposit within it (as you have correctly noted the deposit within the tunnel is not part of the exemption).

Should you have any further queries please do not hesitate to contact us.

Kind regards

Pete

Trwyddedu Morol/ Marine Licensing
Cyfoeth Naturiol Cymru / Natural Resources Wales

www.cyfoethnaturiol.cymru / www.naturalresources.wales

Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.

Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.



Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay

From: Gareth Owen <gareth@yellowsubgeo.com>

Sent: 25 July 2019 17:26

To: Marine Licensing <marinelicensing@cyfoethnaturiolcymru.gov.uk>

Cc: Rhodri Hughes <RhodriHughes@walters-group.co.uk>; Dai Thomas <DaiThomas@walters-group.co.uk>

Subject: Marine Licence enquiry, mouth of River Rhymney, Cardiff

Dear Sir/ Madam,

I am working for Walters UK Ltd, who have been employed by Cardiff City Council to undertake a process of Early Contractor Involvement to feed into the design for a new electricity cable route between the proposed solar farm on Lamby Way landfill and the nearest suitable grid connection off Rover Way, Cardiff. The proposed route requires the crossing of the mouth of the River Rhymney, which is tidal at that point. The need for a Marine Licence has therefore been identified and Yellow Sub Geo are managing the process of application for the licence on behalf of Walters.

The proposed means of crossing the river is directional drilling. I attach a drawing which provides the indicative location of the launch and receiving pits for the drilling process. Each of these are above the Mean High Water Mark, the approximate grid reference for each being as follows:

Launch pit: ST 22076 77596

Receiving pit: ST 21818 77269

I attach a sketch site location plan (Drawing P19121_D01) detailing the proposed approximate location of the two drilling pits and the bored tunnel alignment between.

Following review of the documentation on the NRW website, we are of the opinion that the drilling process itself best falls under the "Bored Tunnels" category, which is classed as Exempt from the licencing process. The NRW website states; *"Activities associated with the construction or operation of a bored tunnel that are carried out wholly under the seabed do not need a licence. The exemption is subject to the condition that the activity must not adversely affect the environment of Wales and the Welsh inshore region or the living resources that it supports."* The website goes on to state that *"the exemption does not apply to the subsequent deposit of any substance into the tunnel, such as cables and pipelines"*.

Upon completion of the drilling process, a tunnel will be formed beneath the bed of the River Rhymney, through which the cabling will be pulled. The above-ground aspect of this operation will be entirely outside of the intertidal area, from the launch and receiving pits described above. However, it is noted that the deposit of cables and pipelines is specifically excluded from the exemption. We therefore would welcome clarification as to whether the entire works may be addressed under an exemption, or whether we may require a Marine Licence.

If the latter, we assume that a Band 1 application is required to cover the operation of pulling the cabling through the tunnel. Whilst such works are not explicitly listed within NRW guidance as a Band 1 activity, we anticipate that they will fall within the *"additional activities not listed that NRW Permitting Service may consider to be eligible as Band 1 activities"* as set out in the NRW Marine Licensing Band 1 Low Risk Activities Guidance. This is because the above-ground works are to be entirely outside of the intertidal zone, and the works within the intertidal zone will be entirely beneath the sea-bed and of relatively small scale.

We also note that the Severn Estuary Special Area of Conservation is within close proximity to the Site, as marked on the attached Drawing P19121_D01. North of the river mouth, the shoreward boundary of the SAC appears to reflect the shape of the high tide mark (albeit with some margin for error in overlaying the NRW SSSI shapefile with the aerial imagery). The SAC boundary then crosses the River Rhymney and then uses the edge of Rover Way to demarcate the boundary south of the river. Our proposed works all lie inland (i.e. to the west) of the SAC boundary and as such fall entirely outside the SAC. Notwithstanding this, we recognise that the site is a sensitive one with respect to intertidal and marine conservation and hence will be providing a detailed ecological assessment and detailed method statements to assess and protect the environment in which we are to be working.

In due course (and prior to the commencement of works), we will provide NRW with a detailed information pack, including proposed works locations, Method Statements and ecological assessments. This will be provided either in support of Written Notice of the intention to carry out works as an exempt activity (under Article 32 of the Marine Licensing (Exempted Activities) (Wales) Order 2011) or in support of a Band 1 application for Marine Licence, dependent upon your advice. We have also approached the Maritime and Coastguard Agency and Glamorgan and Gwent Archaeological Trust for their confirmation that the works will not adversely affect either other marine activities or archaeology respectively and will provide their responses as part of our submission to NRW.

Ahead of this, and in order that we can properly scope and focus our work in the next few weeks, we would welcome your early review of this email and the attached plan in order that you can confirm whether either;

- a) The entire works package can be undertaken under Exemption from the need for a Marine Licence, or;
- b) That the works should be undertaken under a Band 1 Marine Licence.

I look forward to hearing from you on the matter.

Kind regards,

Gareth Owen

Director

E: gareth@yellowsubgeo.com

T: 07572 070 798

W: www.yellowsubgeo.com



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Appendix C: Correspondence with Maritime and Coastguard Agency



Gareth Owen

From: Thomas Bulpit <Thomas.Bulpit@mcga.gov.uk>
Sent: 29 July 2019 16:29
To: Gareth Owen
Cc: marinelicencing@naturalresourceswales.gov.uk
Subject: RE: Marine Licence Band 1 Application, River Rhymney, Cardiff

Dear Gareth,

Thank you for your email in support of a Band 1 (Low Risk Activity) Marine Licence to Natural Resources Wales. Based on the information provided, MCA Navigation Safety Branch do not object to consent being granted, noting that the drilling project will take place underground and will not enter the watercourse or have potential interaction with marine users. We therefore advise the following standard advisory only:

1. The Consent Holder should ensure suitable bunding, storage facilities are employed to prevent the release of fuel oils, lubricating fluids associated with the plant and equipment into the marine environment.

I have cc'd NRW so that they are aware of our response. Should you have any questions, please feel free to get in touch.

Best Regards,

Tom

Thomas Bulpit, Marine Licencing Lead

Navigation Safety Branch, DMSS

Maritime & Coastguard Agency

Spring Place, 105 Commercial Road, Southampton, SO15 1EG

Direct: 020381 72418 | Mobile: 07825 792138

Email: Thomas.bulpit@mcga.gov.uk

 **Maritime & Coastguard Agency** |  **HM Coastguard**

Safer Lives, Safer Ships, Cleaner Seas



From: Gareth Owen <gareth@yellowsubgeo.com>
Sent: 23 July 2019 15:49
To: navigation safety <navigationsafety@mcga.gov.uk>
Subject: Marine Licence Band 1 Application, River Rhymney, Cardiff

Dear Sir/ Madam,

We are currently working on behalf of Walters UK Ltd who are undertaking a process of preliminary design of a directionally drilled cable route beneath the mouth of the River Rhymney, Cardiff. The launch and receiving pits for the drilling will both be above Mean High, with the borehole then being directionally drilled beneath the bed of the tidal river mouth between these two points. The two landward works areas will be securely fenced within a compound and managed as construction sites.

The approximate position of the planned launch and receiving pits are:

Launch pit: ST 22076 77596

Receiving pit: ST 21818 77269

A sketch detailing these is attached.

As the drilling route for the cables runs beneath an intertidal area, a Marine Licence is required. As part of the application process, Natural Resources Wales request that the Maritime and Coastguard Agency be consulted to determine whether the planned works may be a risk to navigation or to others.

There is an operational boatyard positioned on the south-west bank of the River Rhymney immediately upstream of the planned drilling route but, as the works in the intertidal zone are to be completely underground, there is no potential for interaction with traffic from this yard.

Hopefully the above and attached are sufficient to enable the Agency to assess whether our proposed works will/ will not pose a risk to navigation or other water users, but if you need further information or wish to discuss, please do not hesitate to contact me.

Kind regards,

Gareth

Gareth Owen

Director

E: gareth@yellowsubgeo.com

T: 07572 070 798

W: www.yellowsubgeo.com



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Appendix D: Example Method Statement for Directional Drilling

1. PROJECT INFORMATION

1.1 Project Name: Lamby Way solar farm cable connection, Marine

1.2 Project Reference: P19121_R1 Rev01

1.3 Project Location: [Redacted Address]

1.4 Project Description: [Redacted Description]

1.5 Project Start Date: [Redacted Date]

1.6 Project End Date: [Redacted Date]

1.7 Project Manager: [Redacted Name]

1.8 Project Engineer: [Redacted Name]

1.9 Project Supervisor: [Redacted Name]

1.10 Project Safety Officer: [Redacted Name]

1.11 Project Health and Safety Officer: [Redacted Name]

1.12 Project Environmental Officer: [Redacted Name]

1.13 Project Quality Officer: [Redacted Name]

1.14 Project Finance Officer: [Redacted Name]

1.15 Project Legal Officer: [Redacted Name]

1.16 Project Communications Officer: [Redacted Name]

1.17 Project Training Officer: [Redacted Name]

1.18 Project Risk Officer: [Redacted Name]

1.19 Project Compliance Officer: [Redacted Name]

1.20 Project Audit Officer: [Redacted Name]

1.21 Project Review Officer: [Redacted Name]

1.22 Project Closeout Officer: [Redacted Name]

1.23 Project Handover Officer: [Redacted Name]

1.24 Project Sign-off Officer: [Redacted Name]

1.25 Project Completion Officer: [Redacted Name]

1.26 Project Final Review Officer: [Redacted Name]

1.27 Project Archiving Officer: [Redacted Name]

1.28 Project Reporting Officer: [Redacted Name]

1.29 Project Documentation Officer: [Redacted Name]

1.30 Project Communication Officer: [Redacted Name]

1.31 Project Safety Officer: [Redacted Name]

1.32 Project Health and Safety Officer: [Redacted Name]

1.33 Project Environmental Officer: [Redacted Name]

1.34 Project Quality Officer: [Redacted Name]

1.35 Project Finance Officer: [Redacted Name]

1.36 Project Legal Officer: [Redacted Name]



METHOD STATEMENT.

NOTE: Task specific method statements will also be required if specific Task/site conditions vary significantly from those outlined below

Project:		Ref No:	
Activity / Operation:	Directional Drilling		
Location:	L		
Period	From:	To: C	
Client:		PC:	
Personnel / People Involved		Plant / Equipment to be used	
• Drilling rig operator • Operative • At least 2 Persons at all times		• Directional Drilling Rig • Drilling support Lorry • Suitable Reamer • Drill tracker • 2 Way Radios • Layflat Hoses • Standpipe	
Permits required		Training Required	
• None		• Full UK Driving Licence with CAT C entitlement for support lorry • Appropriate Training for drilling rig operator	

Do's and Don'ts	
<u>DO</u> - Ensure that drilling rig, rods, reamers, water hoses, pipe and support lorry are segregated from traffic and pedestrians at all times. - Ensure that utilities are identified, traced and marked prior to commencing directional drilling operations.	<u>DON'T</u> - Allow any personnel to stand in front of 'live' area of drilling rig whilst rig is in operation - Attempt to drill without suitable mud/water mixture - Drill in unmade or loose ground without augers secured in ground - Attempt to drill across known line of existing utilities without confirmation of depth and location.

[illegible]

REVISION NO	DATE	BY	DESCRIPTION
1	29/04/15	PB	ORIGINAL ISSUE
2	10/11/15	PB	RA UPDATE
3	07/10/16	PB	REVIEWED
4	03/02/17	PB	RA Reviewed
5	24/07/17	ML	Reviewed/ Updated

Document Prepared By		Approved By	
Name & Position	Date	Name & Position	Date

SEQUENCE OF EVENTS	
ITEM	ACTIVITY
	<u>THIS METHOD STATEMENT MUST BE USED IN CONJUNCTION WITH OPERATORS MANUAL FOR DIRECTIONAL DRILLING RIG AT ALL TIMES.</u> <u>THIS METHOD STATEMENT REFERS TO DIRECTIONAL DRILLING ELEMENT ONLY AND ASSUMES THAT TRAFFIC MANAGEMENT, EXCAVATION AND USE AND HANDLING OF COILED PIPE HAVE BEEN CARRIED OUT IN ADVANCE AND COVERED BY APPLICABLE METHOD STATEMENTS.</u>
1.	<u>Carry out checks before drilling rig use:</u> • Check oil, water, hydraulic fluid etc. • Check tracks and body • Check all linkages and rack feed system and chains • Inspect drilling rods for signs of fractures or excessive wear • Check condition of tracks. • Start engine and check operation and controls. • Check condition and operation of all pipes, fittings and jets in water delivery system. • Check oil, water, brakes, lights etc on drilling support lorry. • Check operation and calibration of the drill tracker • IF ANY DEFECTS FOUND - REPORT TO SUPERVISOR IMMEDIATELY
2.	<u>Are you permitted to operate the vehicle?</u> • Do you hold a full EU/UK driving licence with appropriate categories for the support lorry? • Have you had the appropriate training for the use of the drilling rig? • Are you fit and healthy? • IF YOU ANSWER NO TO ANY OF THE ABOVE, UNDER NO CIRCUMSTANCES MUST YOU OPERATE A VEHICLE OR TOW A TRAILER
3.	<u>Carry out site checks:</u> • Are existing utilities located, traced and marked? • Are ground conditions known?

	• Are excavations for launch/receive pits of suitable size/depth?
4.	<u>Filling the water tanks in the support lorry:</u> • Identify suitable fire hydrant on existing water main - check with operations staff that main is of sufficient size and that filling the tanks will not cause pressure or flow issues in the network. • Situate support lorry as near as safely possible to fire hydrant with rear of lorry facing hydrant. • If the hydrant is located in the highway, flashing beacon must be used and signs, barriers and cones will be required to guard lorry, hoses and hydrant from traffic and pedestrians. • Apply parking brake and switch off engine. • Open hydrant cover. • Flush hydrant and attach standpipe securely. • Connect lay flat hose to standpipe and water tank in lorry. • Open hydrant and fill water tanks, ensuring water level is constantly monitored. • CAUTION! Static electricity may build up in hose and standpipe during filling. Ensure rubber insulated gloves are used when handling hose during and after filling. • When tanks are full, turn off hydrant. • Disconnect and drain lay flat hose and standpipe. • Stow securely in support lorry. • Close hydrant cover. • REMEMBER! Ensure that lorry is not overloaded when tanks are full - be aware of weights and capacities at all times. • Strike any signs, barriers etc. • Drive lorry to drilling location.
5.	<u>Directional Drilling:</u> • Ensure that utilities are identified and marked on site, particularly location where augers are to be inserted. • If you are unsure about position and depth of any utilities to be crossed along route of drill, DO NOT commence drilling until further details have been obtained i.e. from trial holes or undertakers plans etc. • Refer to plans and walk route of directional drill. • Mark depths required along length of drill on plans and be aware of them. • Position drilling rig to drill into launch pit. • Position drilling support lorry in a safe location near to drilling rig.

	• Segregate area for drilling rig, lorry, pipe and hoses with barriers. • Connect water hoses from support lorry to drilling rig and check operation of water delivery system. • Ensure WATER ONLY is used for Drilling at all times. No Drilling lubricants to added. Caution to be take at all time due to water courses in the vascinity. • Inspect drilling head for damage or wear and connect to first rod on drilling rig. • Confirm that water jets are operational. • Check batteries in Sonde of drill head and confirm that the Sonde signal is being received by the tracker. • All personnel to stand clear of 'live' area of drilling rig i.e. in front of operators' seat. • Commence drilling operation • As drilling proceeds, operative to track the drill head and relay adjustments in depth and direction to the rig operator via 2 way radio communication. • <u>UNDER NO CIRCUMSTANCES IS DRILLING TO PROCEED 'BLIND' I.E. WITH NO-ONE TRACKING THE DRILLING HEAD.</u> • <u>IF DRILLING HEAD STRIKES A UTILITY, STOP DRILLING IMMEDIATELY AND CONTACT SUPERVISOR.</u> • When drilling head reaches reception pit, advance rod until enough is visible to enable connection of reamer. • Stop drilling rig and isolate. • Disconnect drilling head. • Connect reamer to drill rods • Coiled pipe on trailer or laid out is already on site - refer to appropriate methods statement. • Attach towing head to reamer. • Stand clear of pipe and reamer. • Commence reaming operation, drill will pull rods back, ream and pull pipe in behind. • 1 person to watch coiled pipe travel at all times, communicating with rig operator via 2 way radio. • If pipe becomes stuck or obstructed, stop drilling immediately until problem is rectified. • When rods are fully recovered back to drilling rig, ensure sufficient pipe is visible in launch pit and stop rig. • Remove reamer and towing head • Clean drilling rig, rods and reamer with pressure hose attachment • Stow reamer and drilling head securely.
--	---

ECE/RAMS34 Directional Drilling

	• Retract augers • Disconnect and drain down lay flat hoses and stow securely. • Remove drilling rig and support lorry from site. • Drilling operation complete
--	---

NOTE: this method statement covers directional drilling only and further method statements apply to any task being carried out e.g. Excavation.

Site:

Talk given by:

Position:.....

Date given:.....

I have been briefed of the contents of the attached method statement / risk assessment, and fully understand all that has been said to me. I have also had the opportunity to raise any queries relating to the work that is to be carried out.

Method Statement Induction Sheet			
Date	Name	Company	Signature