AQUIND Limited

AQUIND INTERCONNECTOR

Environmental Statement – Volume 3 – Appendix 16.6 Aquatic Ecology Assessment – Tributaries of the North Purbrook Stream, Denmead

The Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 – Regulation 5(2)(a)

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WSP

WSP House

70 Chancery Lane

London

WC2A 1AF

+44 20 7314 5000

www.wsp.com

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APPENDICES

EXECUTIVE SUMMARY

This report has been prepared on behalf of AQUIND Limited (the 'Applicant') to support an application (the 'Application') for a Development Consent Order ('DCO'). AQUIND Interconnector is a proposed electricity Interconnector between France and the UK. The Application for the DCO is made in respect of the UK elements of AQUIND Interconnector (referred to as the 'Proposed Development').

WSP were commissioned by AQUIND Ltd. to undertake aquatic macroinvertebrate and fish surveys of watercourses that could potentially be affected by the Proposed Development. Surveys were undertaken on three sections of a network of watercourses which flow into the North Purbrook Stream.

A total of three fish species were caught, namely minnow *Phoxinus phoxinus*, 3-spined stickleback *Gasterosteus aculeatus* and tench *Tinca tinca*. No species of conservation interest were identified.

The aquatic macroinvertebrate assemblages recorded were indicative of slow flowing or still water, and variable water quality, as might be found in an ephemeral watercourse such as this.

No further surveys were recommended, and no significant effects of the Proposed Development are envisaged on the aquatic ecology of this network of watercourses. A precautionary approach is recommended to managing potential risks of pollution and disturbance caused by site activity during the proposed works.

APPENDIX 16.6 AQUATIC ECOLOGY ASSESSMENT – TRIBUTARIES OF THE NORTH PURBROOK STREAM, DENMEAD

1.1. INTRODUCTION

1.1.1. PROJECT BACKGROUND

1.1.1.1. This report has been prepared on behalf of AQUIND Limited (the 'Applicant') to support an application (the 'Application') for a Development Consent Order ('DCO'). AQUIND Interconnector is a proposed electricity Interconnector between France and the UK. The Application for the DCO is made in respect of the UK elements of AQUIND Interconnector (referred to as the 'Proposed Development').

1.1.1.2. The Proposed Development is described in detail in Chapter 3 (Description of the Proposed Development) of the Environmental Statement Volume 1 (document reference 6.1.3).

1.1.1.3. WSP were commissioned by Aquind Limited in July 2019 to undertake aquatic macroinvertebrate and fish surveys of watercourses that could potentially be affected by the Proposed Development.

1.1.1.4. As part of the Development design, High Voltage Direct Current ('HVDC') Cables will be constructed below ground (via trenching and Horizontal Directional Drilling ('HDD')) running south-north and will cross part of the watercourse.

1.1.1.5. Watercourses potentially affected by the Proposed Development were identified during a preceding aquatic ecology scoping assessment, Appendix 16.5 (Aquatic Ecology Scoping Assessment) of the ES Volume 3 (document reference 6.3.16.5).

1.1.1.6. The Site Boundary indicated in Plate 1 will hereafter be referred to as the 'Site'.

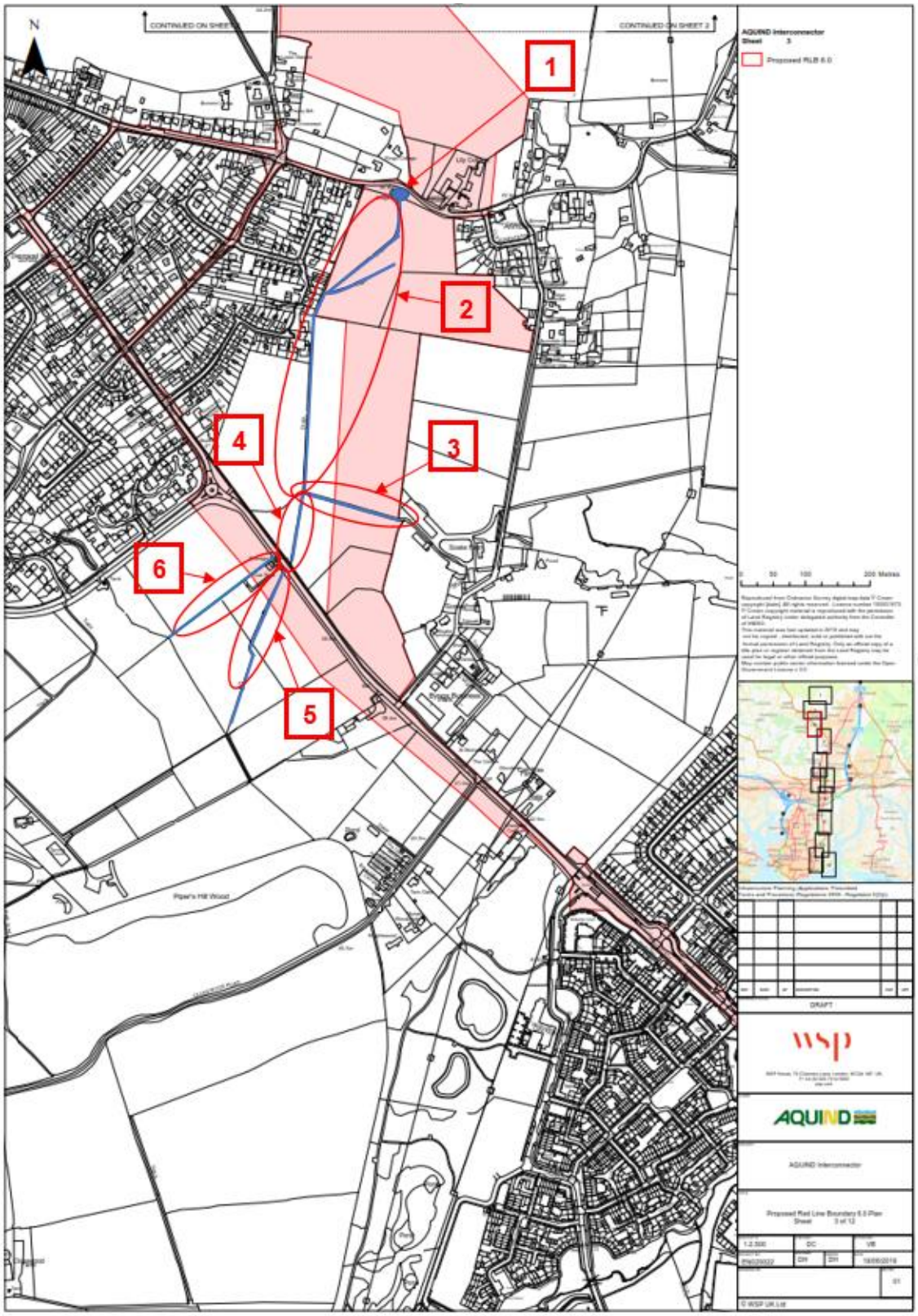

Plate 1 - Map of the Survey Area and the various watercourse sections that were identified within the Site.

1.1.2. DESCRIPTION OF WATERCOURSES

1.1.2.1. Three sections of wet watercourse were identified within the Site. These are interconnected and form part of the headwaters of the North Purbrook Stream, which have been highlighted as a potential migratory route for European eel *Anguilla anguilla* by Natural England.

1.1.2.2. For the purposes of the initial aquatic ecology assessment, sections of the network of watercourses were identified and numbered as illustrated in Plate 1.

1.1.2.3. Of the sections assessed, only three (Sections 3, 5 and 6) were partially accessible and held water.

1.1.2.4. Section 3, on Soake Farm, is situated to the north-east of the B2150 road. It is a shallow tributary which flows in a north-westerly direction before joining the main tributary of the North Purbrook Stream (Section 4) before it flows underneath the B2150 where it splits into Sections 5 and 6.

1.1.2.5. Section 5 which flows through Goodman's Field is immediately to the south of the B2150 and to the east of the car park area.

1.1.2.6. Section 6 is situated immediately to the west of the public car park for Goodman's Field.

1.1.3. SCOPE OF REPORT

1.1.3.1. This report focuses on the three accessible sections of the watercourses identified within the Site (Sections 3, 5 and 6, hereafter referred to as the 'Survey Area') which may be potentially affected by the Proposed Development, as described above.

1.1.3.2. The scope of this report is:

- to provide baseline ecological information with reference to whether legally protected and/or notable aquatic macroinvertebrate species or habitat are present or likely to be present, in the Survey Area;
- to provide baseline ecological information with reference to whether legally protected and/or notable fish species or habitats are present, or likely to be present, in the Survey Area;
- to provide recommendations to enable compliance with relevant legislation and planning policy; and
- if necessary, to identify the need for avoidance, mitigation, compensation or enhancement measures and/or further ecological surveys.

2. METHODS

2.1. AQUATIC MACROINVERTEBRATE SURVEYS

2.1.1.1. Macroinvertebrate sampling, carried out on 5/7/2019, followed Water Framework Directive (WFD) UKTAG Rivers Assessment Methods – Benthic Invertebrate Fauna Guidance (WFD-UKTAG, 2014), which conforms to BS EN ISO 10870:2012 Water Quality – Guidelines for the selection of sampling methods and devices for macroinvertebrates in fresh waters (British Standards Institution, 2012).

2.1.1.2. Three sampling locations were selected; one in each of Sections 3, 5 and 6.

2.1.1.3. One surveyor carried out the sampling using a standard Freshwater Biological Association ('FBA') design sampling net with a rectangular frame, 20 to 25 cm long and 19 to 22 cm tall, a minimum of 30 cm deep and with a 1 mm mesh.

2.1.1.4. At each site all meso-habitats (medium sized habitats) were surveyed and macroinvertebrates were collected using sampling, sweeping and hand searching for three minutes.

2.1.1.5. All samples were preserved in 70% Industrial Denatured Alcohol (IDA) for transportation to the laboratory.

2.1.1.6. Following identification in the laboratory to mixed taxonomic level (TL5) a series of pressure-specific indices were produced.

2.2. BIOLOGICAL INDICES

2.2.1. WHALLEY, HAWKES, PAISLEY AND TRIGG (WHPT) AND THE RIVER INVERTEBRATE CLASSIFICATION TOOL (RICT)

2.2.1.1. The Whalley, Hawkes, Paisley and Trigg (WHPT) metric is the classification method for the assessment of macroinvertebrates in rivers in relation to general degradation, including organic pollution under the WFD (WFD-UKTAG, 2014). The WHPT scoring system replaced the Biological Monitoring Working Party scoring system; the WHPT metric is abundance weighted and scores have been revised to be more representative of each macroinvertebrate family and reflect general pollution rather than just organic pressures (Paisley, et al., 2007). Each macroinvertebrate family is assigned a score from -1.6 to 13, depending on their tolerance to pollution and abundance category (on a continuous scale, -1.6 is for highly abundant pollution-tolerant taxa, 13 is for highly abundant pollution-intolerant taxa) and an overall score is produced from the total.

2.2.1.2. The Average Score Per Taxon (ASPT) is derived from the WHPT index. By dividing the total WHPT score by the Number of scoring TAXA (NTAXA) present, the average score per taxon can be calculated. This metric is more easily comparable with other sites and permits an assessment of biological water quality that is less influenced by the presence of a greater proportion of low scoring taxa or sampling effort than the overall WHPT score.

2.2.1.3. WHPT-ASPT scores are used as a measure of water quality; WHPT-NTAXA is used as a measure of diversity. Higher APST and NTAXA scores indicate higher quality.

2.2.2. COMMUNITY CONSERVATION INDEX (CCI)

2.2.2.1. The diversity and conservation importance of the macroinvertebrate community at each site can be represented by analysing species level data through the Community Conservation Index (CCI). The CCI incorporates elements of taxon rarity and richness to summarise the conservation value of macroinvertebrate communities (Chadd and Extence, 2004). Conservation Scores (CS) defined within Chadd and Extence (2004) are assigned to species within the sample to derive a total sample conservation score which infers a conservation value from the criteria listed in Table 1.

2.2.2.2. The raw data was also analysed for the presence of species with a CS six (Regionally Notable) or above (Chadd and Extence, 2004).

Table 1 - Community Conservation Index (Chadd and Extence, 2004)

Conservation Score	Conservation Classification	Description
0 ≤ 5	Low	Sites supporting only common species and/or a community of low taxon richness.
5 ≤ 10	Moderate	Sites supporting at least one species of restricted distribution and/or a community of moderate taxon richness.
10 ≤ 15	Fairly high	Sites supporting at least one uncommon species, or several species of restricted distribution and/or a community of high taxon richness.
15 ≤ 20	High	Sites supporting several uncommon species, at least one of which may be nationally rare and/or a community of high taxon richness.
> 20	Very high	Sites supporting several rarities, including species of national importance, or at least one extreme rarity (e.g. taxa included in the British RDBs) and/or a community

		of very high taxon richness (potentially of national significance and may merit statutory protection).

2.2.3. LOTIC-INVERTEBRATE INDEX FOR FLOW EVALUATION (LIFE)

2.2.3.1. Macroinvertebrates have specific requirements for flow conditions and can be used to determine not only predominant flow types (Extence *et al*., 1999), but also changes in flow character. The LIFE metric uses abundance data to assign a flow preference score to macroinvertebrate species present in a sample and an overall score for the site can be interpreted as an abundance-weighted average score per taxon metric.

2.2.3.2. There are currently no class boundaries for LIFE scores, but a threshold of 0.94 is used to indicate the presence of low stressed macroinvertebrate communities (Environment Agency, 2012).

2.2.4. PROPORTION OF SEDIMENT-SENSITIVE INVERTEBRATES (PSI)

2.2.4.1. The PSI metric aims to act as a proxy for the quantity of fine sediment at a site (Extence *et al*., 2011). Macroinvertebrate species are assigned a fine sediment sensitivity rating that ranges from highly insensitive to highly sensitive to fine sediment. The PSI score is calculated as the percentage of sensitive taxa in the sample and used to indicate how sedimented a watercourse is, from minimally sedimented/unsedimented to heavily sedimented (Table 2).

Table 2 - PSI scores and interpretation.

PSI Score	River bed condition
81 – 100	Minimally sedimented/ unsedimented
61 – 80	Slightly sedimented
41 – 60	Moderately sedimented
21 – 40	Sedimented
0 – 20	Heavily sedimented

2.3. FISH SURVEYS

2.3.1.1. The fish communities of Sections 3, 5 and 6 were surveyed on 5/7/2019 by electric fishing, using a battery powered backpack system (e-Fish).

2.3.1.2. Electric fishing is the term applied to a process that establishes an electric field in the water in order to capture fish. When exposed to the field, most fish become oriented toward the anode and as the density of the electric field increases they swim toward it. In close proximity to the anode, they are immobilised.

2.3.1.3. Electric fishing followed a standard electric fishing method and technique following guidelines developed by the Environment Agency (Beaumont et al., 2002; EA, 2001; EA, 2007) and which conformed to British Standard BS EN 14011:2003 Water Quality – Sampling of Fish with Electricity (British Standards Institution, 2003).

2.3.1.4. Electric fishing was carried out by wading, using a battery powered backpack system (e-Fish). This was carried out by a two-person fishing team who surveyed the watercourse in short sections, where it was possible to enter the watercourse. Immobilised fish were captured using a hand net and placed into a container of fresh water to recover.

2.3.1.5. Sampled fish were transferred to an aerated container from which they were identified to species level, weighed and measured from the tip of their snout to the end of the middle caudal fin rays (fork length); before being returned safely to the watercourse from which they were captured.

2.4. ENVIRONMENTAL MEASUREMENTS AND OBSERVATIONS

2.4.1.1. Measurements of conductivity, water temperature, dissolved oxygen and pH were obtained at each macroinvertebrate and fish sampling location using a calibrated YSI ProDSS handheld multiparameter meter. The turbidity and flow of the watercourse were also noted at the time of sampling.

2.4.1.2. At each site, a standardised field sheet was completed to include details of channel and bank physical habitat (material of banks and substrates, flow types, physical processed, bank structure), riparian land use and potential sources of anthropogenic stress.

2.5. NOTES AND LIMITATIONS

2.5.1.1. Every effort has been made to provide a comprehensive description of the macroinvertebrate and fish communities within the Survey Area; however, the following specific limitations apply to this assessment:

- Access to all the watercourses in the Survey Area was severely restricted by overgrown vegetation. It was therefore only possible to undertake 'spot sampling' of fish in the sections which were open and accessible. The results therefore can only be presented as a qualitative, minimum estimate of the fish community.

- Ecological survey data is typically valid for two years unless otherwise specified, for example if conditions are likely to change more quickly due to ecological processes or anticipated changes in management.
- The metrics calculated by the River Invertebrate Classification Tool ('RICT') are not appropriate for artificial waterbodies, non-flowing or ephemeral waterbodies (such as ditches), or sites located within 2.5 km of their source.

3. RESULTS

3.1. AQUATIC MACROINVERTEBRATES

3.1.1.1. The biological indices that were produced for each sampling site are displayed in Table 3.

Table 3 - Biological indices of the macroinvertebrate data for each site

Site	WHPT Score	WHPT-NTAXA	WHPT-ASPT	CCI	LIFE	PSI
Section 3	79.1	22	3.60	4.41	5.93	6.67
Section 5	83.2	21	3.96	3.75	5.93	0.00
Section 6	40.2	11	3.65	1.13	5.88	32.00

3.1.2. ALL SECTIONS

3.1.2.1. The CCI scores recorded for all sections indicated the macroinvertebrate community assemblages to be of "Low" conservation value.

3.1.2.2. The WHPT-ASPT scores for all sections were low and indicative of an ephemeral watercourses with variable water quality.

3.1.2.3. The macroinvertebrate assemblages in each section of watercourse consisted primarily of taxa with a preference for slow flowing or standing water such as water scavenger beetles Helophoridae, aquatic snails including the white ramshorn *Gyraulus albus* and pollution tolerant taxa such as water hoglouse *Asellus aquaticus* and non-biting midge larvae Chironomidae. This is reflected in the LIFE scores, which are indicative of communities with no flow sensitive species.

3.1.2.4. The PSI scores for all sections indicate habitats that are heavily sedimented or sedimented.

3.2. FISH

3.2.1. SECTION 3

3.2.1.1. Access to watercourse was restricted to two short areas where the vegetation allowed. Sampling was carried out in two short sections of 10 m in length. The catch was consisted of a small number of 3-spined stickleback Gasterosteus aculeatus.

3.2.2. SECTION 5

3.2.2.1. There were sections of water within Section 6 that could be accessed. Sections of approximately 15 m, 10 m and 25 m were surveyed. Several 3-spined stickleback, a single juvenile tench *Tinca tinca* (67mm), and four minnow *Phoxinus phoxinus* were sampled.

3.2.3. SECTION 6

3.2.3.1. A section of approximately 15 m was surveyed and no fish were caught. The rest of the section either inaccessible, due to dense vegetation, or unfishable, due to low water levels.

3.3. ENVIRONMENTAL VARIABLES AND OBSERVATIONS

3.3.1.1. The values of various environmental variables, as recorded at the time of sampling, are presented in Table 5. Conductivity, pH and flow showed little variation between each section.

Table 4 - Environmental variables recorded in each survey section.

Environmental variable	Section 3	Section 5	Section 6
Conductivity (μScm^{-1})	618	604	592
Dissolved oxygen (mg/l)	3.1	8.35	3.87
Dissolved oxygen (% saturation)	30.3	86.6	38.5
pH	8.01	7.91	7.78
Turbidity	Low-moderate	Moderate-high	Low-moderate
Water Temperature (ºC)	14.3	17.0	15.0
Flow	None	None	None

3.3.2. SECTION 3 - SOAKE FARM

3.3.2.1. Water levels were very low at the time of the survey (<10 cm) and there was no discernible flow. The watercourse is narrow and incised with a bed comprising a mix of gravel, overlain with silt. A hedgerow runs along the right-hand bank with blackthorn *Prunus spinosa*, hawthorn *Crataegus monogyna*, oak *Quercus* sp. and bramble *Rubus fruticosus agg.*, with a meadow on the left-hand bank. The channel was largely overgrown with bankside and emergent vegetation, with yellow-flag iris *Iris pseudacorus*, soft rush *Juncus* sp. and branched burr reed *Sparganium erectum* dominant.

3.3.2.2. The low dissolved oxygen level recorded for Section 3 are indicative of standing water. This would also be consistent with the observed low levels of turbidity.

3.3.3. SECTION 5 – GOODMAN'S FIELD

3.3.3.1. Section 5, which flows through Goodman's Field, is largely overgrown with marginal and emergent vegetation, save for a few short areas of open water. The bed of the watercourse is silt over gravel, and the channel vegetation is dominated by yellow flag iris, with fool's water-cress *Apium nodiflorum* in open sections. The channel is incised, steep banked and poached in a number of areas. There was no discernible flow and the water was moderately turbid, presumably because of disturbance caused by dogs entering the water.

3.3.3.2. The relatively high dissolved oxygen levels recoded for Section 5 indicates that there may be a fresh source of water flowing into this section of the watercourse. This would also be consistent with the observed high levels of turbidity.

3.3.4. SECTION 6 – WEST OF GOODMAN'S FIELD CAR PARK

3.3.4.1. This section was more open than the others, owing to shading provided by the mature trees on the left-hand bank, but still heavily vegetated in places with grasses and tall herbs on both banks. The watercourse was a wetted ditch with a bed comprising silt over a clay bed.

3.3.4.2. The low dissolved oxygen levels recorded for Section 6 are indicative of standing water. This would also be consistent with the observed low levels of turbidity.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1.1. CONCLUSIONS

4.1.1.1. The fish community was restricted to coarse fish and minor species. No species of conservation interest were identified. A total of three fish species were identified; tench, minnow and 3-spined stickleback.

4.1.1.2. The aquatic macroinvertebrate community was dominated by taxa which prefer slow flowing or standing water. No species of conservation concern were identified.

4.1.1.3. The macroinvertebrate community was dominated by taxa which are indicative of slow flowing or standing water with a lack of habitat diversity. No species of conservation interest were identified.

4.1.2. RECOMMENDATIONS

4.1.2.1. No further surveys are recommended in relation to the aquatic ecology of the watercourses within the Site.

4.1.2.2. It is unlikely that the Proposed Development will have any significant effects on the aquatic ecology of the watercourses within the Site, however, a precautionary approach should be taken when working near watercourses, and appropriate pollution prevention measures should be included within the Construction Environment Management Plan ('CEMP') (see the Onshore Outline CEMP (document reference 6.9).

4.1.2.3. Noise and vibration in and around the water course must be controlled and kept to the minimum necessary. In relation to the proposed drilling activity, measures to reduce noise and vibration should be implemented, especially when working beneath watercourses, to prevent disturbance and additional mobilisation of sediments.

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Appendix 1 – Relevant Legislation and Planning Policy

RELEVANT LEGISLATION AND PLANNING POLICY

1.1.1.1. This report has been compiled with reference to relevant wildlife legislation and planning policy.

1.2. SALMON AND FRESHWATER FISHERIES ACT 1975

1.2.1.1. This Act covers regulation of fisheries in England and Wales and includes legislation that covers the introduction of polluting effluents, the obstruction of fish passage (screens, dams, weirs, culverts etc) illegal means of fishing, permitted times of legal fishing and fishing licencing (which covers electric fishing).

1.2.1.2. Under this act any person who causes or knowingly permits to flow, or puts or knowingly permits to be put, into any waters containing fish or into any tributaries of waters containing fish, any liquid or solid matter to such an extent as to cause the waters to be poisonous or injurious to fish or the spawning grounds, spawn or food of fish, shall be guilty of an offence.

1.2.1.3. The act also requires that fish passes are installed on new and rebuilt barriers that affect waters frequented by salmon or migratory trout. In the future, it is likely that fish passage facilities will need to be designed to accommodate all fish species and life stages, with nature-like bypass channels being the most appropriate solution currently available.

1.3. NATURAL ENVIRONMENT AND RURAL COMMUNITIES (NERC) ACT 2006

1.3.1.1. Species and Habitats of Principal Importance in England and Wales are listed under Section 41 and Section 42 respectively of the NERC Act. The Section 41 and 42 lists detail species that are of principal importance for the conservation of biodiversity in England and Wales, and should be used to guide decision-makers such as local and regional authorities when implementing their duty to have regard for the conservation of biodiversity in the exercise of their normal functions – as required under Section 40 of the NERC Act 2006.

1.4. THE WATER ENVIRONMENT (WATER FRAMEWORK DIRECTIVE) (ENGLAND AND WALES) REGULATIONS 2017

1.4.1.1. The purpose of the WFD is to establish a framework for the protection of inland surface waters (rivers and lakes), transitional waters (estuaries), coastal waters and groundwater and for water all waterbodies (unless artificial or heavily modified) to achieve “good” ecological status.

1.4.1.2. Ecological Status is expressed in terms of five classes (high, good, moderate, poor or bad). These classes are established on the basis of specific criteria and boundaries defined against biological, physico-chemical and hydromorphological elements. Biological assessment uses numeric measures of communities of plants and animals (for example, fish and rooted plants). Physico-chemical assessment looks at elements such as temperature and the level of nutrients, which support the biology. Hydromorphological quality looks at water flow, sediment composition and movement, continuity (in rivers) and the structure of physical habitat.

1.4.1.3. The overall Ecological Status of a water body is determined by whichever of these assessments is the poorer. For example, a water body might pass ‘Good Status’ for chemical and physico-chemical assessments but be classed as ‘Moderate Status’ for the biological assessment. In this case it would be classed overall as ‘Moderate Ecological Status’. To achieve the overall aim of good surface water status, the Directive requires that surface waters be of at least Good Ecological Status and Good Chemical Status. To achieve High Status, the Directive requires that the hydromorphological Quality Elements are also in place.

1.4.1.4. When considering the effect of a development or activity on a waterbody it is a regulatory requirement under the WFD to assess if it will cause or contribute to a deterioration in status or jeopardise the waterbody achieving good status in the future.

1.5. GLOBAL INTERNATIONAL UNION FOR CONSERVATION OF NATURE (IUCN) RED LIST

1.5.1.1. Species status assessments are a globally recognised way of identifying conservation priorities. The principles underpinning such assessments are that they should be objective and based on scientific information, and that information on species conservation status and distribution should provide the foundation for making informed decisions about preserving biodiversity at local to global levels.

1.5.1.2. The IUCN Red List of Threatened Species is the world's most comprehensive inventory of the global conservation status of plant and animal species. It uses a set of criteria to evaluate the extinction risk of thousands of species and subspecies. These criteria are relevant to all species and all regions of the world. With its strong scientific base, the IUCN Red List is recognized as the most authoritative guide to the status of biological diversity.

Appendix 2 – Aquatic macroinvertebrate taxon list and Conservation Scores

AQUATIC MACROINVERTEBRATE TAXON LIST AND CONSERVATION SCORES

1.1.1.1. Results from laboratory analysis of the macroinvertebrates samples are displayed in Table 1. An explanation of the Conservation Score definitions, as defined by Chadd and Extence (2004), is provided below the table.

Table 1: Taxon lists for macroinvertebrate samples, abundance and Conservation Scores (CS)

Taxa	CS	Section 3 abundance	Section 5 abundance	Section 6 abundance
Agabus bipustulatus	1	0	0	13
Anacaena globulus	1	2	0	0
***Anopheles* sp.**	N/A	0	0	32
Asellus aquaticus	1	515	34	2741
Chironomidae	N/A	392	190	22
Chrysopidae	N/A	0	0	1
Cladocera	N/A	0	1	0
Collembola	N/A	0	0	2
Crangonyx pseudogracilis	1	4	2	23
Dendrocoelum lacteum	2	1	0	0
***Dixa* sp.**	N/A	0	0	13
Galba truncatula	3	1	0	0
Gammarus pulex	1	4	0	410
Gammarus pulex/fossarum agg.	N/A	0	0	707

Gammaridae	N/A	1	0	0
Glossiphonia complanata	1	1	1	0
***Glossiphonia* sp.**	N/A	2	1	0
Gyraulus albus	1	15	22	0
Gyrinus substriatus	1	0	1	0
Haliplus lineatocollis	1	0	3	0
Helobdella stagnalis	1	3	0	0
Helophorus brevipalpis	1	1	6	5
Helophorus grandis	2	0	2	0
Hydracarina	N/A	1	2	2
Hydraena gracilis	1	3	0	0
Hydraenidae	N/A	0	1	0
Hydroporus palustris	1	0	1	0
Ilybius fuliginosus	1	1	1	5
Limnephilidae	N/A	0	1	0
Limnephilus lunatus	1	7	36	118
Melanogaster hirtella	N/A	1	0	0
Nepa cinereal	3	3	1	0
***Notonecta* sp.**	N/A	1	8	0
Oligochaeta	N/A	25	18	30
Ostracoda	N/A	23	21	0
Physa fontinalis	1	0	1	0
***Pisidium* sp.**	N/A	351	226	0
Potamopyrgus antipodarum	1	2	1	0
Psychodidae	N/A	8	3	0
Radix balthica	1	0	1	0
Sciomyzidae	N/A	3	1	0

Sigara fossarum	3	1	0	0
Succineidae	N/A	10	0	14
Tricladida	N/A	0	0	3
Velia caprai	2	5	1	17
***Velia* sp.**	N/A	74	39	23

Appendix 3 – Site images

SITE IMAGES

Figure 1: Section 3 – Soake Farm

Figure 2: Section 5 Goodman's Field

Figure 3: Section 6 - West of Goodman's Field Car Park

Appendix 4 – Fish Images

FISH IMAGES

Figure 1: Lateral view of 3-spined stickleback Gasterosteus aculeatus sampled from Section 3.

Figure 2: Lateral view of minnow *Phoxinus phoxinus* sampled from Section 5.

Figure 3: Lateral view of the juvenile Tench *Tinca tinca* sampled from Section 5.