

ENVIRONMENTAL PERMITTING (ENGLAND AND WALES) REGULATIONS 2016

APPEAL BY NNB GENERATION COMPANY (HPC) LIMITED (the “APPELLANT”)

WATER DISCHARGE ACTIVITY AT HINKLEY POINT C, SOMERSET

PERMIT VARIATION APPLICATION RELATING TO ACOUSTIC FISH DETERRENT

APPLICATION REF: EPR/HP3228XT/V004

APPEAL REF: APP/EPR/573

**STATEMENT OF COMMON GROUND BETWEEN THE
APPELLANT AND THE ENVIRONMENT AGENCY**

25 May 2021

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1. INTRODUCTION

The relevant parties

- 1.1 This Statement of Common Ground ("**SoCG**") has been agreed between:
- 1.1.1 NNB Generation Company (HPC) Limited (the "**Appellant**"); and
 - 1.1.2 The Environment Agency (the "**EA**")
- (together, the "**Parties**")
- 1.2 The EA is the "regulator" for the purposes of the Environmental Permitting (England and Wales) Regulations 2016 (the "**2016 Regulations**") and was the competent authority for the purposes of Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (the "Habitats Regulations") during the determination of the permit variation application that this appeal relates to.
- 1.3 On 13 March 2013, the Appellant was granted the Hinkley Point C Water Discharge Activity Environmental Permit (EPR/HP3228XT) (the "**WDA Permit**") authorising the discharge of water into the Severn Estuary in connection with the cooling water system at Hinkley Point C.
- 1.4 This Appeal is against the deemed refusal of an application by the Appellant to vary the WDA Permit to remove the requirement to install an acoustic fish deterrent (ref: EPR/HP3228XT/V004) (the "**Application**").
- 1.5 This SoCG sets out matters agreed between the Parties in relation to this Appeal.

Purpose and structure

- 1.6 This SoCG has been prepared in accordance with the "Environmental Permits Appeal Procedure Guidance" dated September 2019.
- 1.7 This SoCG also refers to documents which are agreed to be relevant to this case. These documents are contained in an agreed bundle of Core Documents and a reference to each document is given in the following format: (**CD Ref: XX**).
- 1.8 A glossary has been prepared as an addendum to this Statement of Common Ground. These terms are anticipated to be used throughout the Core Documents and Inquiry.
- 1.9 This SoCG is structured as follows:
- 1.9.1 Key legislation, guidance and case law and definitions (in **Section 2**).
 - 1.9.2 Details regarding the relevant environmental permit which is the subject of the Appeal, the associated development consent order ("**DCO**"), design details and engineering (in **Section 3**)
 - 1.9.3 Agreed matters relating to the Habitats Regulations Assessment process (in **Section 4**)
 - 1.9.4 Matters not agreed by the parties (in **Section 5**)
 - 1.9.5 Draft conditions (in **Section 6**)
- 1.10 Where relevant, sub-headings are used beneath these broad topic headings to assist the reader in identifying the relevant points.

2. KEY LEGISLATION, GUIDANCE, CASE LAW AND DEFINITIONS

Legislation

- 2.1 The following represent the primary statutory instruments, directives and conventions relevant to the Appeal:
- 2.1.1 The Environmental Permitting (England and Wales) Regulations 2016; (**CD Ref: 11.1**)

- 2.1.2 The Conservation of Habitats and Species Regulations 2017 (as amended); (**CD Ref: 11.2**)
- 2.1.3 The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019; (**CD Ref: 11.6**)
- 2.1.4 Council Directive 92/43/EEC (the "**Habitats Directive**"); and (**CD Ref: 11.3**)
- 2.1.5 Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat (**CD Ref: 11.4**)
- 2.2 Subject to paragraph 2.5, the Parties agree that the provisions of the Water Framework Directive (2000/60/EC), do not provide a reason why the permit variation Application should be refused.
- 2.3 The Parties also agree that matters regarding the Wild Birds Directive (2009/147/EC) are not material for the purposes of this Appeal.
- 2.4 The Environment Agency confirms that it has no objection to the variation of the permit aside from its concerns under the Conservation of Habitats and Species Regulations 2017 (and under the Water Environment (Water Framework Directive) Regulations 2017 insofar as they apply to European sites as protected areas). If the Secretary of State is satisfied that the proposal would not adversely affect the integrity of the European sites then the permit variation should be granted.
- 2.5 For clarification, the Environment Agency's view is that the WFD imports the requirements of the Habitats Directive. The EA's view is that the Water Framework Directive specifies that areas requiring special protection under other EU Directives (such as the Habitats Directive) are identified as protected areas for the purposes of Article 4.1(c). The EA's view is that achieving the objectives of SACs is a requirement of WFD because they are Protected Areas for purposes of WFD. As such, the EA will submit that if there is a breach of the Habitats Directive then there will also be a breach of the WFD.
- 2.6 However, the Environment Agency raises no separate issue under the WFD. In particular, the EA does not allege a breach of the WFD water body status and it does not argue, for example, that matters arising from the discharge of moribund biomass will breach the WFD.
- 2.7 The Appellant is of the view that no breach of the WFD arises and will address this in its legal submissions, as necessary

Key Provisions

- 2.8 The key provision in the Habitats Directive for the purposes of this appeal is Article 6(3):
- Article 6(3):
- "Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."*
- 2.9 The Habitats Directive does not itself have any status under domestic law, however the Habitats Directive is transposed into English and Welsh law by the Habitats Regulations.
- 2.10 The key requirements of Article 6(3) of the Habitats Directive are set out in regulation 63 of the Habitats Regulations which provides, inter alia:
- "(1) A competent authority, before deciding to undertake, or give any consent, permission or other authorization 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 of the plan or project for that site in view of that site's conservation objectives*

[...]

- (5) *In light of the conclusions of the assessment, and subject to regulation 64, 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 or the European offshore marine site (as the case may be).*
- (6) *In considering whether a plan or project will adversely affect the integrity of the site, the competent authority must have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which it proposes that the consent, permission or other authorization should be given.”*

2.11 Regulation 101 expressly applies the provisions of the Habitats Regulations to the grant and reviews of environmental permits.

Case Law

2.12 The Parties will agree a statement of legal propositions including agreed case law principles. This statement will be submitted to the Inspector by 25 May 2021, in line with the timetable agreed at the pre-inquiry meeting on 24 March 2021.

Guidance

- 2.13 The parties agree that the following guidance is of particular relevance to the Appeal:
- 2.13.1 Defra, Natural England, Welsh Government and Natural Resources Wales, 2021. *Habitats Regulations Assessments: Protecting a European Site.* (CD Ref: 12.1)
 - 2.13.2 European Commission, 2019. Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Luxembourg: Office for Official Publications of the European Communities. (CD Ref: 12.2)
 - 2.13.3 ODPM Circular and Defra Circular, 2005. Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impact within the Planning System. TSO (The Stationery Office) (CD Ref: 12.5)
 - 2.13.4 Assessment of Plans and Projects Significantly Affecting Natura 2000 sites- Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission 2001) (CD Ref: 12.3)
 - 2.13.5 JNCC, 2004. *Common Standards Monitoring Guidance Introduction to the Guidance Manual.* Online (CD Ref: 12.4)
 - 2.13.6 Commission of the European Communities, 2000. *Communication from the Commission on the Precautionary Principle.* Brussels (CD Ref: 12.6)
 - 2.13.7 Natural England and Countryside Council for Wales, 2009. *The Severn Estuary EMS Regulation 33 Conservation Advice Package.* (CD Ref: 12.16)
 - 2.13.8 Changes to the Habitats Regulations 2017. Policy paper “The main points and processes of the 2019 Regulations, which amend the Habitats Regulations 2017 that transpose the Habitats and Wild Birds Directives, to make them operable from 1 January 2021”, 1 January 2021. (CD Ref: 12.22)
 - 2.13.9 PINS Advice Note Ten: Habitats Regulations Assessment relevant to Nationally Significant Infrastructure Projects. Republished November 2017 (version 8) (CD Ref: 12.23)

Definitions relevant to the application of the tests at Regulation 63 of the Habitats Regulations

- 2.14 Scientific names for fish species referred to by common name below are as follows;
- 2.14.1 Atlantic cod (*Gadus morhua*)
 - 2.14.2 Whiting (*Merlangius merlangus*)
 - 2.14.3 European seabass (*Dicentrarchus labrax*)
 - 2.14.4 Atlantic herring (*Clupea harengus*)
 - 2.14.5 Atlantic salmon (*Salmo salar*)
 - 2.14.6 Twait shad (*Alosa fallax*)
 - 2.14.7 Allis shad (*Alosa alosa*)
- 2.15 **"European site"** means; a Special Area of Conservation ("**SAC**"), Special Protection Areas ("**SPA**") or European Offshore Marine Site.
- 2.16 **"Ramsar site"** means a site designated under the criteria of the Ramsar Convention on Wetlands of International Importance. Ramsar sites are included as a matter of policy in Habitats Regulations Assessments.
- 2.17 The term **"European Marine Site"** collectively describes SACs and SPAs so far as they consist of marine areas.¹ This is not an independent statutory designation.
- 2.18 **"Integrity"** is not defined in the Habitats Directive. The European Commission's 2019 Guidance states:
- 'The 'integrity of the site' can be usefully defined as the coherent sum of the site's ecological structure, function and ecological processes, across its whole area, which enables it to sustain the habitats, complex of habitats and/or populations of species for which the site is designated.'*²
- 2.19 The meaning of "conservation", "conservation status" and "favourable conservation status" in the Habitats Regulations refer to the definitions in the Habitats Directive as follows:
- 2.20 **Article 1(a) "conservation"** means a series of measures required to maintain or restore the natural habitats and the populations of species of wild fauna and flora at a favourable status as defined in Article 1(e) (habitats) and Article 1(i) (species) (see below);
- 2.21 **Article 1(e) "conservation status of a natural habitat"** means the sum of the influences acting on a natural habitat and its typical species that may affect its long-term natural distribution, structure and functions as well as the long-term survival of its typical species within the territory referred to in Article 2³.
- (A) The conservation status of a natural habitat will be taken as **"favourable"** when:
 - (1) its natural range and areas it covers within that range are stable or increasing, and
 - (2) the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and

¹ Regulation 8(3), Habitats Regulations (CD Ref: 11.2)

² Para 4.6.4, European Commission, 2019. Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. (CD Ref: 12.2)

³ i.e. the European territory of the Member States to which the Treaty applies

- (3) the conservation status of its typical species is favourable as defined in Article 1(i);
- 2.22 **Article 1(i) "conservation status of a species"** means the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its populations within the territory referred to in Article 2⁴;
- 2.23 The conservation status will be taken as "**favourable**" when:
- (1) population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
 - (2) the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
 - (3) there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis;
- 2.24 **Article 1(f) "habitat of a species"** means an environment defined by specific abiotic and biotic factors, in which the species lives at any stage of its biological cycle.
- The Impact of the UK's withdrawal from the EU and the status of the Habitats Directive**
- 2.25 As of 1st January 2021 the United Kingdom left the European Union. The European Union (Withdrawal) Act 2018 (the "**Withdrawal Act**"), ss2-7 (**CD Ref:** 11.5) governs the role which legislation derived from European Legal Instruments continues to have in the UK.
- 2.26 The Habitats Regulations (**CD Ref:** 11.2) continue to have effect by virtue of section 2 of the Withdrawal Act.
- 2.27 Further, decisions of the CJEU made prior to 31 December 2020 continue to have effect in the UK by virtue of section 3 of the Withdrawal Act. At present, those decisions may only be departed from by the Supreme Court or the Court of Appeal (see the European Union (Withdrawal) Act 2018 (Relevant Court) (Retained EU Case Law) Regulations 2020) (**CD Ref:** 11.7). Decisions of the CJEU made after 31 December 2020 are to be treated as 'persuasive authority' (i.e. not binding but carrying weight) (see s6 Withdrawal Act) (**CD Ref:** 11.5).
- 2.28 The Habitats Regulations were amended by the Conservation of Habitats and Species (Amendment)(EU Exit) Regulations 2019 (the "**2019 Amendment Regulations**") (**CD Ref:** 11.6) to ensure that the Habitats Regulations are 'fit for purpose' following Brexit. A number of the changes involve transferring functions from the European Commission to the appropriate authorities in England and Wales. The basic obligations of the competent authorities have not changed.
- 2.29 As a result of the 2019 Amendment Regulations **SACs** and SPAs in the UK no longer form part of the European Union's Natura ecological network. The 2019 Amendment Regulations have created a national site network ("NSN") which includes existing SACs and SPAs and any new SACs and SPAs designated under the same Regulations.
- 2.30 The Parties agree that the 2019 Amendment Regulations do not affect the applicable legal principles in this case
- 2.31 Ramsar Sites, or Designated Wetlands of International Importance, do not form part of the NSN. However, the National Planning Policy Framework ("**NPPF**") (**CD Ref:** 12.18) at paragraph 176 provides that Ramsar sites should be given the same protection as SAC and SPAs.

⁴ i.e. the European territory of the Member States to which the Treaty applies

3. THE DCO, THE ENVIRONMENTAL PERMIT, DESIGN DETAILS AND ENGINEERING

The DCO, the Environmental Permit and the Marine Licence

- 3.1 Development consent to build and operate a nuclear power station at Hinkley Point, including two pressurised water reactors of EPR design⁵, known as Hinkley Point C, (“HPC”) was granted by DCO under the Planning Act 2008 on 19 March 2013 (**CD Ref:** 5.1). The project is under construction. The cooling water system for HPC is designed to abstract seawater from the Severn Estuary through two intake tunnels extending approximately 3.3km offshore, to use this water to cool the condensers from the cooling circuits of the two nuclear reactors, and to then discharge the water back into the Severn Estuary through a single outfall tunnel. The location of HPC, the two intake tunnels and the outfall tunnel, is shown on **Figure 1**.
- 3.2 The Appellant was granted the WDA Permit authorising the cooling water discharge on 13 March 2013 (**CD Ref:** 5.4).
- 3.3 The Marine Management Organisation (“MMO”) granted a marine licence on 7 June 2013 for works required to construct HPC (licence number L201300178/4) (**CD Ref:** 5.2).
- 3.4 The preventative (mitigation) measures proposed for HPC included the intake design being a low velocity side-entry (“LVSE”) intake, an acoustic fish deterrent (“AFD”) system and a fish recovery and return (“FRR”) system. Agreed details regarding the LVSE intake and FRR system are set out below.
- 3.5 The WDA Permit included within it several conditions relevant to the commissioning, optimisation and operation of the FRR and AFD:
- 3.5.1 Operating techniques (Table S1.2): stating operation of the Acoustic Fish Deterrent (AFD) system 24 hours per day.
 - 3.5.2 Operating techniques (Table S1.2): stating Commissioning Plan for AFD and FRR Systems in accordance with PO8.
 - 3.5.3 Pre-operational measure PO2 (Table S1.4): Requiring as-built description of the plant and infrastructure, including the AFD and FRR systems.
 - 3.5.4 Pre-operational measure PO8 (TableS1.4): Requiring a Commissioning plan for the AFD and FRR systems, including optimisation.
- 3.6 Equivalent conditions are imposed on the DCO and marine licence.
- 3.7 A condition was also placed upon the DCO that trials would be carried out of any AFD system installed at HPC (DCO requirement CW1, Part 2) (**CD Ref:** 5.6).

The Application

- 3.8 On 15 February 2019, the Appellant submitted the Application to the EA. The Application seeks the removal of those conditions in the WDA Permit which relate to the AFD. No other changes are proposed. Should the Appeal be successful then corresponding applications will be made to vary the DCO (**CD Ref:** 5.1) and marine licence (**CD Ref:** 5.2) to remove the equivalent requirements.

Details regarding Hinkley Point A and Hinkley Point B

- 3.9 Hinkley Point A (“HPA”) is a twin reactor Magnox station undergoing decommissioning which is located in the West Somerset District of the county of Somerset, South West England. It is situated on the Hinkley Point headland in Bridgwater Bay, on the southern shore of the Bristol Channel, from which it drew 44 m³/s cooling water supplies during its operational phase. HPA began operations in 1965 and ceased operations in 2000

⁵ The EPR is a third generation pressurised water reactor design. In Europe this reactor design was called European Pressurised Reactor, and the internationalised name was Evolutionary Power Reactor, but it is now simply named EPR.

- 3.10 The Hinkley Point B (“**HPB**”) power station is situated immediately adjacent to the east of HPC. HPB draws cooling water supplies from the Bristol Channel. The Parties do not agree on the precise volume of cooling water supplies drawn, but agree that the correct number is close to 34 m³/s. HPB began operations in 1976 and is planned to cease operations and commence defueling no later than July 2022. HPB is operated by a subsidiary of EDF Energy, which is the parent company of the Appellant. The location of HPB is shown on **Figure 1**. To estimate the impingement at HPC the assessment approach adopted by both Parties is to scale the measured impingement at HPB by the ratio of the cooling water volumes extracted by the two stations (SPP112, **CD Ref: 7.11**) and TB003, **CD Ref: 8.28**)
- 3.11 HPC will draw 131.8 m³/s of cooling water supplies from the Bristol Channel. The Parties do not agree on precisely how many times greater this volume will be than that abstracted by HPB (as there is not agreement on the HPB flowrate, see above) but agree that the correct number is close to 4. HPC is planned to commence operations in June 2026 and to have an operational life of 60 years during which this abstraction and the associated entrainment and impingement will be continuous, apart from periods of maintenance.

Low Velocity Side Entry intake heads

Overview of LVSE heads

- 3.12 The 4 LVSE heads will be placed on the seabed at locations that are approximately 3.3 km offshore (see **Figure 1**)⁶. Each LVSE is a rectangular concrete ‘box’ with two intake surfaces (apertures) on either side of the long axis of the structure. The long axis is 35.5m long and orientated with the direction of flow (on the ebb and flood tides). ⁷ The narrow axis is 10m wide and both ends are closed and are hydrodynamic in form as they face the tidal flows of the estuary. The intake surfaces (apertures) are 2m high with centres approximately 2.5m above the seabed, with the base of the aperture being approximately 1.5m above the sea bed. The LVSE heads are located approximately 10km from the deep-water channel of the estuary and are submerged throughout the tidal cycle.
- 3.13 Unlike the HPB intake which is open at the top the LVSE is closed on the top, i.e. the apertures are vertical on either side of the box and primarily take water in horizontally (i.e. Side Entry), with minimal vertical draw down. The peak vertical draw down of the LVSE is 0.2-0.25 m/s extending 20 cm at the top edge.

Agreed aspects regarding the operation and efficiency of LVSE heads

- 3.14 The LVSE heads have been designed to minimise impingement by:
- 3.14.1 limiting the exposure of the intake surfaces to the tidal stream, to reduce impingement for fish swimming with the tidal stream. That is, they reduce the cross sectional intercept area of the intake presented to the prevailing tidal directions by mounting the head at right angles to the tidal flow. The LVSE heads at HPC mitigate fish entrapment by: (i) decreasing the cross sectional area of the four, 35.5 m long x 2 m high intakes, that is exposed to the tidal flow, (ii) through the side entry design reducing the number of pelagic fish drawn vertically down into the intake and (iii) by having the the base of the aperture raised approximately 1.5m above the sea bed reducing entrapment of benthic species.
 - 3.14.2 reducing intake velocities, into the head to a target velocity of 0.3m/s during all tidal states. In order to maximise the possibility of fish avoiding abstraction, a velocity of 0.3m/s during all tidal states is a best practice target.

⁶ See also: EDF Energy 2017 Hinkley Point C Cooling water Infrastructure Fish Protection Measures: Report to Discharge DCO Requirement CW1 (**CD Ref: 5.6**)

⁷ Whilst the tidal currents at HPC are highly rectilinear, there is approximately a 10 degrees difference between the flood and ebb tidal axis meaning there will be minor misalignment at various stages of the tide depending on alignment. The LVSE can be placed with an accuracy of ±1 degree.

The HPC intakes are estimated to achieve this target over a proportion of the intake face for a proportion of the time. The Parties disagree on the relevant proportions.

- 3.14.3 reducing vertical velocities (which fish are ill equipped to resist) by means of a cap on the intake.
- 3.15 The LVSE heads therefore represent an improvement over the existing caisson intake design which extracts cooling water for HPB and previously HPA, but the Parties disagree as to the extent of this improvement. At and above low water neaps both the HPB vertical and horizontal intake surfaces are fully submerged, but at low water on springs the seawater level can drop below the horizontal screen with a large proportion of the intake surface above the surface of the water. The precise intercept areas are unable to be agreed between the Parties.(SPP107) (CD Ref: 7.10 and TB006 CD Ref: 8.4).
- 3.16 During the determination process for the original DCO, no assessment of the efficacy of the LVSEs in reducing impingement rates was taken into account. However deflection efficiency of the AFD system and efficiency of the FRR system were estimated. In the case of the AFD, the deflection efficiency figures were derived from the EA's Report, Screening for Intake and Outfalls: a best practice guide, Science Report SC030231 (Turnpenny and O'Keeffe 2005) (CD Ref: 9.3).
- 3.17 Whilst the LVSE intake is 35.5m long and 2m high, the orientation of the head largely parallel to the tidal streams means the projected intake cross sectional area is smaller than the physical area. It varies depending on the misalignment between the head and the tidal currents, as their directions change over the tidal cycle.
- 3.18 Pelagic species are less able to swim against vertical currents than horizontal ones. The intake cap reduces the vertical current and therefore reduces the entrapment of pelagic species. The intake velocity cap factor is a multiplier that represents the number of fish that will be entrapped in an intake with a cap as opposed to an open intake. It has a low value for pelagic species because they are protected from entrapment by vertical currents when the intake head is capped.
- 3.19 For the species that the Parties have agreed are relevant to this Appeal (see **Table 3**), both Parties agree the following intake velocity cap factors. The estimates are based on the best available evidence, and calculated in EA report TB007 (CD Ref: 8.5):

Table 1

Species	Intake velocity cap factor
Allis shad	0.23 (range 0.18-0.28)
Twaite shad	0.23 (range 0.18-0.28)
Atlantic salmon	0.23 (range 0.18-0.28)*
European seabass	1.00
Atlantic cod	1.00
Atlantic herring	0.23 (range 0.18-0.28)
whiting	1.00

*With the understanding that adult salmon, kelts and smolts migrate close to the sea surface, as described in TR456 Sections 4.6.1 and 4.6.2 (CD Ref: 1.11) Based on

literature summarised in EA (2020)⁸ the intake velocity cap could potentially provides some benefits for the midwater species European sea bass, Atlantic cod and whiting, although a precise factor has not been specified.

Fish Recovery and Return system

- 3.20 The cooling water system also encompasses a forebay and pumping station for each intake tunnel, located onshore. The forebay is a large, 29m deep structure that allows the hydraulic energy from the seawater to dissipate before it enters the pumping station. In the pumping station, debris and organisms which pass through the widely spaced bars on the LVSE intake heads will be removed before the water enters the power station cooling water system. This occurs using a further coarse bar screen (the space between these bars is 50mm), fine mesh (5mm) drum screens which protect the main cooling water supply to the steam condensers, and band screens (also 5mm) which protect the rest of the cooling water system. The coarse screens are equipped with time and pressure actuated rakes that will remove larger debris and fish from the bars to a dedicated gutter in the pumping station. Each drum and band screen is fitted with buckets to recover fish and discharge them into a common gutter system for return to the sea. This system is referred to as the FRR system.
- 3.21 The design of the FRR system has been refined and improved since the DCO was granted and incorporated into the HPC design.⁹
- 3.22 The design of the FRR System for Hinkley Point C has been approved by the MMO in consultation with the EA and others as part of the discharge of DCO Requirement CW1. The CW1 requirement was discharged after detailed consultation with the EA and Natural England ("**NE**"), Natural Resources Wales ("**NRW**") and Devon and Severn Inshore Fisheries and Conservation Authority.
- 3.23 FRR mortality rates are derived from a combination of the proportion of fish of each species expected to be impinged upon each type of screen (trash, band and drum), and the mortality rate for that species at that screen. The FRR mortality estimates set out in report TR456 (**CD Ref:** 1.11) are based upon the EA's report Screening for Intake and Outfalls: a best practice guide, Science Report SC030231 (Turnpenny and O'Keeffe 2005) (**CD Ref:** 9.3). TB008 (**CD Ref:** 8.6) contains a review of scientific literature relating to FRR mortality rates carried out by the EA. For the species that the Parties have agreed are relevant to this Appeal (see **Table 3**), (with the exception of salmon), predicted FRR mortality factors are set out in Table 2. The Parties disagree on the predicted mortality factor for salmon.

Table 2

Species	Predicted Mortality Factor
Allis shad	1.00
Twaite shad	1.00
European seabass	0.61
Atlantic cod	0.56
Atlantic herring	1.00
Whiting	0.55

4. MATTERS RELATING TO THE HABITATS REGULATIONS ASSESSMENT PROCESS

Relevant designated sites and qualifying interest features

- 4.1 It is agreed between the Parties that only the European sites and interest features of those sites listed in Table 3 (comprising Table 3A and Table 3B) are relevant to this Appeal. It is common ground between the Parties that no other species of fish other than those identified

⁸ EA 2020 guidance: Nuclear power stations cooling waters protecting biota (**CD Ref:** 9.23)

⁹ EDF Energy 2017. Hinkley Point C Cooling Water Infrastructure Fish Protection Measures: Report to Discharge DCO Requirement CW1 (**CD Ref:** 5.6)

in Table 3 below are relevant to the Appeal. No other habitats or other features are relevant to the proposed permit variation. Table 3B is contained in Section 5 (matters for disagreement).

- 4.2 The Parties agree that the presence or absence of the AFD would not change the entrainment or impingement risk to eel. The Parties are agreed that the Appeal does not need to consider European eel.

Table 3A

Interest feature	Relevant European site
Twaite shad	Severn Estuary SAC Annex II qualifying species
Atlantic Salmon Allis shad Twaite shad	Severn Estuary Ramsar Criterion 4
Atlantic cod European seabass Atlantic herring Whiting	Severn Estuary Ramsar Criterion 8
Atlantic salmon Twaite shad	River Usk SAC Annex II qualifying species. River Usk SAC Annex II qualifying species.
Atlantic salmon Twaite shad Allis shad	River Wye SAC Annex II qualifying species. River Wye SAC Annex II qualifying species. River Wye SAC (present but not a primary reason for site selection)

- 4.3 The relevant citation and conservation objectives (including supplementary advice) for each of the sites listed in Table 3 above are those set out in in Appendix 1. The location of the relevant European sites in relation to HPC and the cooling water system is shown in **Figure 1** (which shows the Severn Estuary Ramsar site) and **Figure 2** (which shows the Severn Estuary SAC, River Wye SAC and River Usk SAC).
- 4.4 The test pursuant to the Habitats Regulations is whether it can be ascertained that the relevant project "will not adversely affect the integrity of the European site" (Regulation 63(5)) (**CD Ref:** 11.2). The assessment must be undertaken in view of the designated site's Conservation Objectives.

Relevant In-Combination plans / projects

- 4.5 Any HRA must be done 'in-combination' with other plans and projects, including within project in combination effects. It is agreed that the relevant plans and projects that must be assessed in-combination are as set out in section 5 of the Environment Agency's Appropriate Assessment (**CD Ref:** 4.1)¹⁰.
- 4.6 The Parties do not agree on the effects of the project when considered alone. The Parties do however agree that no other plan or project gives rise to additional adverse effects which could act in combination.

Baseline data

- 4.7 Since the DCO (**CD Ref:** 5.1) was submitted, the combination of more science and more scrutiny has led to improved understanding of the expected impacts of HPC. Both Parties seek to account for and to recognise these iterative improvements in understanding in their analyses and submissions.

¹⁰ In particular, the Parties agree that the de-commissioning of HPB is a relevant project for in-combination assessment.

Bristol Channel Fishery Data Set

- 4.8 Numerous datasets are available to describe the fish populations of the Severn Estuary SAC and Ramsar, the River Wye SAC and the River Usk SAC. These include impingement monitoring at HPB, rod and net catch data for Atlantic salmon, data from the Unlocking the Severn project (2017-2019), historic records of twaite shad bycatch in the putcher net fishery, and Atlantic salmon in Severn Estuary tributary rivers as well as those detailed in Bird (2008) (**CD Ref:** 9.45)
- 4.9 The Hinkley Point B data set comprises:
- 4.9.1 a monitoring study consisting of 24 hour samples of impinged fish at Hinkley Point B, known as the Comprehensive Impingement Monitoring Programme (“**CIMP**”) dataset. The Parties do not agree on the appropriate monitoring period which should be used to define the scope of this dataset. The Appellant argues that the 40 samples collected over a 12 month period from February 2009 to January 2010 is the appropriate dataset. The EA argues that the 52 samples collected over a 16 month period from February 2009 to May 2010 is the appropriate dataset;
 - 4.9.2 a long-term 37 year (1981-2017) Routine Impingement Monitoring Programme (“**RIMP**”) dataset, consisting of monthly samples collected over a 6 hour period, during daylight.
- 4.10 In order to improve the accuracy and sensitivity of the impingement monitoring the CIMP survey was designed to provide a higher resolution dataset than the RIMP dataset which only sampled for 6 hours a month or 72 hours per annum. The CIMP sampling plan was for 40 x 24-hour samples conducted on (pseudo) randomly selected sampling dates stratified into 10 samples per quarter, i.e. a maximum of 960 hours sampling per annum. Data from 40 sampling visits representing one year, from February 2009 to January 2010 was used to calculate annual impingement rates in TR456 (**CD Ref:** 1.11) with data and code used to analyse the data supplied to the EA. More recently, SPP112 (**CD Ref:** 7.11) applies the same source data.

Impingement predictions corrected for raising factors and flow rates

- 4.11 For Atlantic cod, whiting, European seabass, Atlantic herring, twaite shad and allis shad impingement estimates for HPB, and impingement predictions for HPC are based upon scaling impingement monitoring data collected during the CIMP.
- 4.12 The Parties agree that analysis of the CIMP dataset did not provide evidence for an ebb-tide bias and so on a precautionary basis an ebb-tide bias factor should not be applied when estimating impingement rates.
- 4.13 The EA completed a vertical audit and Quality Assurance (Environment Agency TB001) (**CD Ref:** 8.1) of the HPB raw impingement datasets and the computer code (R script) used to generate the HPC predictions. In the audit of the raw data, four occasions (out of the 40 samples) were identified when the number of cooling water pumps operating and the number of screens sample misaligned.
- 4.14 In response to TB001, the Appellant undertook an internal audit of the data and consulted HPB engineers to determine how the number of screens and pumps misaligned. In so doing, additional information was made available to the Appellant to refine the flow rate information for impingement assessments.

Approach to assessment

- 4.15 HPC impingement is predicted by reference to impingement monitoring data from a nearby site (HPB). Data from the CIMP were used to predict HPC annual impingement for Atlantic cod, whiting, European seabass, Atlantic herring, twaite shad and allis shad. The process of estimating HPC impingement consists of scaling the estimated annual impingement at HPB by the ratio of the cooling water volumes extracted by the two stations, scaling this by a factor to account for the intercept cross sectional area of the HPC intakes as compared to HPB;

and then scaling by a further factor for pelagic species (Atlantic herring, twaite shad, allis shad and salmon) due to the use of capped intakes at HPC.

- 4.16 Both parties agree that, given the current evidence and analysis of the CIMP and RIMP data the abstraction volume to impingement ratio can be considered linear.
- 4.17 Because many fish species produce large numbers of offspring, mortality of larval and juvenile fish will not have the same effect on a population as removing the same number of adults would, due to the fact that many of the larvae and juveniles would never have survived to contribute to the spawning population. The parties agree that it is appropriate to express numbers of impinged fish in terms of an equivalent number of adults, in order to contextualise the losses of fish of all ages in terms of the equivalent number of adult fish that they represent. This is the Equivalent Adult Value ("EAV").
- 4.18 For each species, the numbers of impinged equivalent adults was multiplied by an estimate of mortality in the FRR system to arrive at a predicted number of equivalent adults lost per year.
- 4.19 To express losses with reference to adult populations, the number of equivalent adults lost was compared to a measure of population size, either Spawning Stock Biomass (SSB) (Atlantic cod, whiting, European seabass), fishery landings (Atlantic herring) or number of adults (twaite shad, allis shad). For a species where predicted losses were compared to a mass of adults (SSB), this was achieved by multiplying the number of equivalent adults predicted to be lost annually at HPC by the mean weight of an adult fish of that species in the population.
- 4.20 The EA broadly agrees with the Appellant's quantitative assessment approach but in carrying out its own assessment, adjusted parameters to reflect what the EA considers to be the most up-to-date evidence and data. Not all of these adjustments are agreed by the Appellant.
- 4.21 The Appellant accepts the methodology for accounting for how the change in screen mesh size between HPB (10 mm screens) and HPC (5 mm screens) would affect the proportion of fish impinged. However, the Appellant cannot accept the methodology used to estimate EAV numbers for larval and very small fish that would be impinged on the 5mm screens.
- 4.22 The Parties agree that the inclusion of entrainment losses ensures the assessment is conducted on the full potential impacts from operating the cooling water system and not solely on impingement.
- 4.23 The Parties agree that the quantitative approach can be used to predict losses at HPC but disagree on some of the parameters that should be used and some of the methods used to derive those parameters, as detailed in Section 5.
- 4.24 However, both Parties do agree that there is uncertainty within the derivation of many of the parameters used within the quantitative assessment of impacts. Therefore where appropriate and quantitatively predicted, the effects of these uncertainties should be considered in the analyses.

Other agreed matters relating to fish assessment

- 4.25 Both parties agree that conclusions about impacts on fish populations should be based on rigorous and impartial evidence that takes account of the latest science and data
- 4.26 Species, numbers of individuals and lengths of fish caught are as recorded in the CIMP and RIMP data sets.
- 4.27 Allis shad
- 4.27.1 The Parties do not agree on any parameters regarding the assessment of allis shad.

4.28 For twaite shad, the Parties agree that:

- 4.28.1 It is reasonable to apportion the population estimates between the contributing rivers according to the current accessible spawning areas within each, as presented in TB016 (**CD Ref:** 8.15). This is an apportionment of 100% for the Severn Estuary, 50% for the River Wye, 25% for the River Usk and 25% for the River Severn.
- 4.28.2 The APEM model described in TB016 will be used to provide mean estimates of twaite shad population size for the purposes of this inquiry.

4.29 For Atlantic salmon, the Parties agree that:

- 4.29.1 A preliminary assessment, prepared by Cefas, the EA and NRW, for ICES in March 2020 (**CD Ref:** 9.50), classifies:
- the salmon population of the River Severn as being 'probably at risk' and predicted to remain 'probably at risk' in 2024, with egg deposition attained only 51% of the river's Conservation Limit in 2019.
 - the salmon population of the River Wye as being 'probably at risk' and predicted to remain 'probably at risk' in 2024, with egg deposition attained only 31% of the river's Conservation Limit in 2019.
 - the salmon population of the River Usk as being 'probably at risk' and predicted to remain 'probably at risk' in 2024, with egg deposition attaining 70% of the river's Conservation Limit in 2019.
- 4.29.2 The 'Management Objective' (MO) for salmon stocks in England and Wales is that they should meet or exceed their CLs in at least four years out of five (i.e. at least 80% of the time). Compliance with this objective takes trends in egg deposition into account. For rivers that are are classified as 'probably at risk' there is a 5% < p < 50% of achieving the MO.
- 4.29.3 Nine salmon were recorded within the RIMP survey. These fish were described in the table below (Section 4.1 and Table 6 of TR456 (**CD Ref:** 1.11))

Table 4

Date	Number	Weight (g)	Length(s). (Not recorded in the 1980s)	Likely development stage
1981	1	-	N/A	Recorded as salmon parr but more likely to have been a smolt
1983	1	-	N/A	Salmon parr or smolt
1987	1	-	N/A	Kelt. Many fish die after spawning but a proportion return to the sea and survive to spawn for a second time. Kelts dropping downstream are in poor condition.
1989	1	-	N/A	Kelt (post-spawning adult salmon).
1998	1	-	97 mm SL (standard length)	Smolt
2000	1	6	35 mm SL	Salmon parr. Fish was very small, so possibly a fish that was in poor condition / subject to wash-out after flooding

2002	1	3400	605 mm SL	Returning adult fish
2004	2	162	117 mm and 165 mm SL	Salmon parr or smolts

- 4.29.4 Only 2 salmon were recorded in the CIMP survey, and after the period used by the Appellant to provide data for EAV calculations (SPP112) (**CD Ref:** 7.11). These fish were 150mm and 160mm and recorded in February and March 2010 respectively.
- 4.29.5 For the purposes of the appropriate assessment, over the period 1997-2017, mean population size for the River Severn will be taken as 3,038 adult salmon, as calculated in TB017 (**CD Ref:** 8.16).
- 4.29.6 For the purposes of the appropriate assessment, over the period 1997-2017, mean population size for the River Wye SAC will be taken as 5,890 adult salmon, as calculated in TB017. (**CD Ref:** 8.16).
- 4.29.7 For the purposes of the appropriate assessment, over the period 1997-2017, mean population size for the River Usk SAC will be taken as 6,269 adult salmon, as calculated in TB017. (**CD Ref:** 8.16).
- 4.29.8 For the purposes of the appropriate assessment, over the period 1997-2017, mean population size for the Severn Estuary will be taken as 17,616 adult salmon, as calculated in TB017. (**CD Ref:** 8.16).

4.30 For Atlantic cod, the Parties agree that:

4.30.1 For the calculation of EAVs for Atlantic cod, mean length at age is as follows:

Age	0	1	2	3	4	5+
Length (cm)	16.5	33.1	58.6	78.9	89.9	98.6

4.30.2 For the calculation of EAVs for Atlantic cod, natural mortality (rate/year) is as follows:

Age	0	1	2	3	4	5+
Natural mortality	1.12	0.51	0.33	0.21	0.17	0.14

4.31 For European seabass, the Parties agree that:

4.31.1 For the calculation of EAVs for European seabass, mean length at age is as follows:

Age	0	1	2	3	4	5	6	7
Length (cm)	8.61	16.52	21.27	26.70	31.90	35.87	40.19	44.80
Age	8	9	10	11	12	13	14+	
Length (cm)	47.88	51.75	52.50	49.00	50.75	58.50	60.50	

5. POINTS OF DISAGREEMENT

5.1 The Parties do not agree on the following issues.

Habitats Regulations matters

5.2 The Parties disagree as to whether it is possible to conclude no adverse effect on the integrity of the Severn Estuary SAC and Ramsar, the River Usk SAC and the River Wye SAC as a result of the Application, in relation to the alone assessment.

5.3 The Appellant does not agree with the conclusion of the EA's HRA 'alone' assessment

5.4 The Appellant does not agree that the "Notable estuaries assemblage" forms part of the Severn Estuary SAC Qualifying Habitat as a matter of law. However, if it does, then it is agreed between the Appellant and the EA that only the species in Table 3B are relevant to this appeal for that purpose.

Interest feature	Relevant European site
Estuaries - Notable estuarine assemblages: Atlantic salmon Allis shad Twaite shad Atlantic cod European seabass Atlantic herring Whiting	Severn Estuary SAC Annex I qualifying habitat

Fish assessment matters

5.5 The Appellant disagrees with the conclusions about the effects of HPC entrapment that have been reached by the EA, as well as the methods used by the EA to reach those conclusions.

5.6 The EAV methods used by EA and the Appellant lead to different estimates of the equivalent annual losses of spawning fish owing to entrapment and to different conclusions about the effects on population abundance. The Appellant does not agree that the EAV method with the SPF extension, as applied in the EA Appropriate Assessment, provides a valid estimate of the annual rate of entrapment of adult fish that can be compared with spawning population size.

5.7 The Appellant does not agree with the EA estimates of the spawning population sizes of the marine fishes (sea bass, Atlantic cod, whiting), and argues that the true population sizes are larger than the EA propose. Differing estimates of spawning population size affect the apparent significance of entrapment because annual rates of entrapment are reported as a percentage of spawning population size.

5.8 The Appellant does not agree with the EA that the effects of HPC entrapment are significant in relation to the effects of other factors that drive trends in the abundance of the spawning populations of the relevant species.

5.9 The Appellant's case is that data from the RIMP survey are valuable for assessing long-term trends in the impingement rates of a number of the species that are relevant to the Appeal and as an indicator of baseline variability in local abundance of these species. The EA disagrees with this.

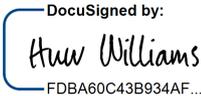
LVSE intercept area

5.10 For the purposes of this Appeal, the Appellant will apply a value of 1 for scaling the intake intercept area between HPB and HPC. However, the Appellant considers that this is a precautionary approach and the true value is likely to be lower. The EA disagrees with this approach.

6. DRAFT CONDITIONS

6.1 The EA has prepared a mark-up of the WDA Permit which shows the proposed changes to the WDA Permit, should the Appeal be granted. The Appellant disagrees with a number of the EA's proposed changes. The position of both the EA and the Appellant in relation to the proposed changes is set out in an addendum to the Statement of Common Ground dated 25 May 2021.

This Statement of Common Ground has been agreed by both the EA and the Appellant.

Signed:  DocuSigned by:
Huw Williams
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Huw Williams
Senior Managing Lawyer
On behalf of the Environment Agency
Dated: 25 May 2021

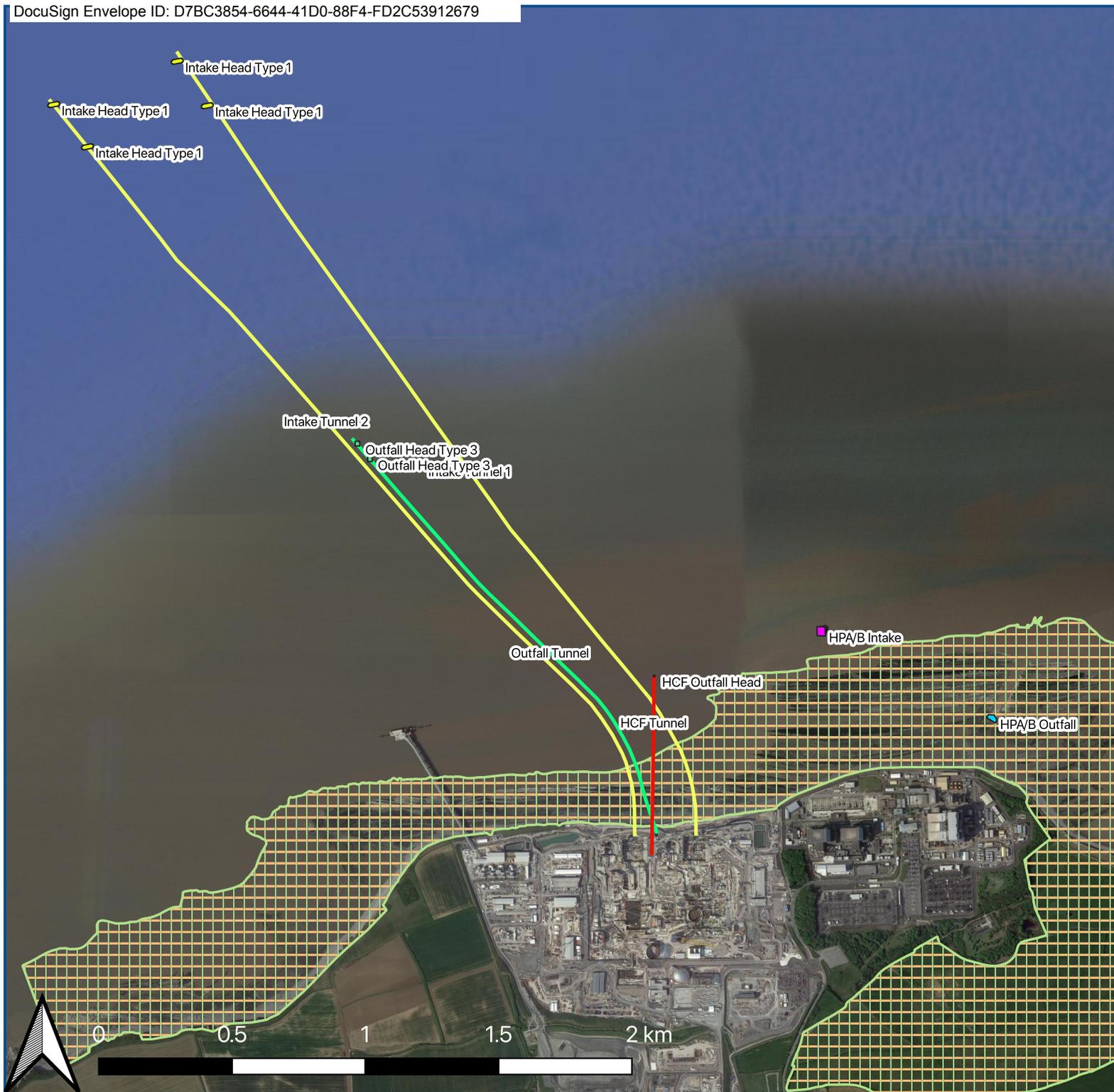
Signed by **NNB Generation Company (HPC) Limited**

 DocuSigned by:
Richard Savage
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acting by **Richard Savage**, director

APPENDIX 1**SAC CITATIONS, CONSERVATION OBJECTIVES AND REGULATION 33 ADVICE**

Severn Estuary Documentation	
CD 12.29	Severn Estuary SAC Citation
CD 12.30	Severn Estuary Natura 2000 Standard Data Form
CD 12.13	European Site Conservation Objectives for Severn Estuary
Information on RAMSAR Wetlands, The Severn Estuary	
CD 11.4	Ramsar Convention on Wetlands of International Importance Especially as Waterfowl Habitat (extracts)
Advice under Regulation 33(2)(a), The Severn Estuary	
CD 12.16	Natural England and Countryside Council for Wales, advice given under regulation 33 in relation to the Severn Estuary (June 2009)
River Usk Documentation	
CD 12.31	River Usk Natura 2000 Standard Data Form
CD 12.15	River Usk Core Management Plan
River Wye Documentation	
CD 12.32	River Wye SAC Citation
CD 12.33	River Wye Nature 2000 Standard Data Form
CD 12.14	European Site Conservation Objectives for River Wye
CD 12.24	Supplementary Advice for River Wye
CD 12.17	River Wye Core Management Plan



Legend

EU Designated Sites

- Severn Estuary Ramsar
- Severn Estuary SPA

Tunnels

- Outfall
- Intake
- HCF - Fish Return

Heads

- Intake Head Type 1
- Outfall Head Type 3
- HCF - Fish Return Outfall Head
- HPA/B Intake
- HPA/B Outfall

FIGURE 1

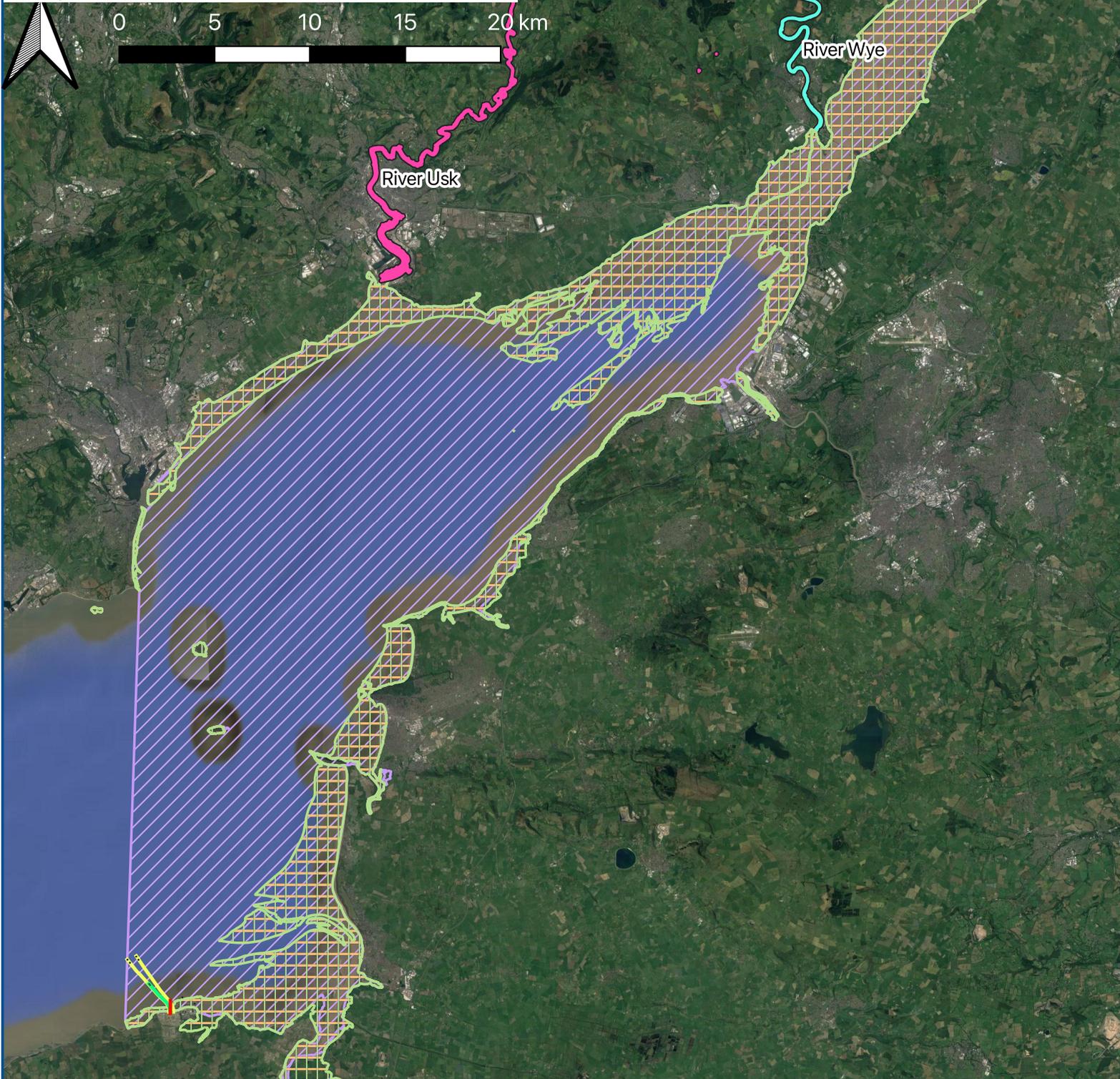
Plan name: HPA, HPB, HPC and Severn Estuary SPA / Ramsar Location Plan

Project name & number: 1388, Water Intake HRA Enquiry

Drawn by: JW

Date: 23/04/2021





Legend

EU Designated Sites

- River Usk SAC (100m Buffer)
- River Wye SAC (100m Buffer)
- Severn Estuary Ramsar
- Severn Estuary SPA
- Severn Estuary SAC

Tunnels

- Outfall
- Intake
- HCF - Fish Return

Heads

- Intake Head Type 1
- Outfall Head Type 3
- HCF - Fish Return Outfall Head
- HPA/B Intake
- HPA/B Outfall

FIGURE 2

Plan name: HPA, HPB, HPC and Severn Estuary, River Usk and River Wye Designated Sites

Project name & number: 1388, Water Intake HRA Enquiry

Drawn by: JW

Appeal ref: APP/EPR/573**Addendum to Statement of Common Ground****Statement of position of Environment Agency ("EA") and Appellant in relation to conditions**

The EA has prepared a mark-up of the WDA Permit which shows the EA's proposed changes to the WDA Permit, should the Appeal be granted. This mark-up is attached as Appendix 1 to this Addendum. The Appellant disagrees with a number of the proposed changes. The position of both the EA and the Appellant is set out in the table below.

	Changes	EA Comments	Appellant's Comments
Item	Table S1.1 Activities		
1.	<p>The effluent from the FRR system has been included as a Water Discharge Activity (WDA) – Activity Ref: FRR.</p> <p>This has been described as 'Discharge of trade effluent (comprising cooling water) via outlet 3.</p> <p>The effluent has been titled 'Waste stream H' and limited to 'Trade effluent consisting of a small proportion of returned abstracted cooling water via the Fish Recovery & Return (FRR) System'.</p>	<p>The FRR system will discharge water back to the estuary via a dedicated outlet. This water will return fish and invertebrates, retrieved from the abstracted cooling water. Some of these will go on to survive but some will be dead or dying (known as moribund biota). As this biota breaks down it has the potential to impact water quality and local</p>	<p>The Appellant notes that the FRR has always been included in the HPC design and with or without an AFD would always have returned biota (dead and alive) to the estuary.</p> <p>The Appellant also notes that the EA's HRA WFD assessments have shown no adverse impacts resulting from the return of marine organisms,</p>

		habitats and species (EA 2020 HRA, CD Ref: 4.1). It is therefore regarded as polluting matter, and therefore this activity is regarded as a WDA and must be authorised on the permit.	both dead or alive, to the estuary via the FRR. The FRR has been specifically included in the HPC design as an environmental benefit, not only for those fish that survive the abstraction and impingement but also by returning and retaining the biomass within the estuary ecosystem. The Appellant therefore does not view this as necessary. However, in the interests of resolving differences and assisting the inquiry, this change is accepted.
2	Activity references included: CWPE to signify the cooling water & process effluent activity. FRR to signify the FRR system activity.	As the permit now authorises more than one activity, an 'Activity reference' column has been added to distinguish between the two activities. (NB this extra column has been added to all following tables were applicable).	Change accepted
Table S1.2 Operation techniques			

3	Removal of reference to Section 3.1.3 from the Main document from the original permit application	EA agrees with the removal of this reference as this section refers to the AFD system. Therefore if the AFD requirement is removed, then this section of this document will need to be updated (see proposed change to PO2).	Agreed
4	Removal of reference to operating an AFD 24 hours per day	EA agrees if the requirement for AFD is removed then this operating technique will need to be removed.	Agreed
5	Removal of reference to AFD within the Commissioning Plan	EA agrees if the requirement for AFD is removed then this reference will need to be removed.	Agreed
Table S1.4 Pre-operational measures			
PO2 – requires a report which includes a completed, as-built description of the plant and infrastructure relevant to the WDA			
6	'for approval' included	This has been added to clarify that the Pre-operational measure will be considered complete once adequate information has been provided for its approval.	The Appellant notes that this addition is not triggered by the removal of the AFD but is prepared to accept the change.

7	'Water Discharge Activity' has been made plural	This is due to the addition of the FRR WDA. As in the permit now covers two discharge activities.	Change accepted
8	Reference to including the AFD design removed and a requirement to provide an updated Section 3.1.3 of the Environmental permit application for Hinkley Point C, application reference EPR/HP3228XT/A001 - Main document.	EA agrees if the requirement for AFD is removed then this reference will need to be removed, and this section of this document updated to no longer refer to an AFD system (linked to proposal for Table S1.2).	No further comment
	PO3 – requires the submission of a report reviewing the substance loadings and emissions		
9	'for approval' included	This has been added to clarify that the Pre-operational measure will be considered complete once adequate information has been provided for its approval.	The Appellant notes that this addition is not triggered by the removal of the AFD but, as with item 1, is prepared to accept the change in the interests of assisting the inquiry.
	PO8 – Requires the submission of a commissioning Plan		
10	Removal of reference to the AFD	EA agrees if the requirement for AFD is removed then this reference will need to be removed.	Agreed

	PO11 – requires submission of an Environmental Monitoring Plan for the Severn Estuary SAC, SPA & Ramsar for the purposes of post-scheme appraisal.		
11	<p>'Local population surveys of fish species' has been added to the list that shall be included.</p>	<p>This condition provides a list of aspects that the Environmental Monitoring Plan should consider. The EA has added this to the list to a) substantiate the population estimates relied on as part of the assessments and b) ensure trends in the relevant populations can be identified and any potential impact from HPC investigated if needed.</p> <p>The appropriate monitoring strategy for this will be devised further through the development and approval of this Environmental Monitoring Plan.</p> <p>The environmental monitoring is a necessity due to the current uncertainties involved</p>	<p>The Appellant accepts this, but only on the understanding that the surveys are those conducted on impinged fish in the FRR system and periodically sampled via the 'fish trap'.</p>

		in both the Appellant's and EA's assessments.	
12	'with reference to Activity CWPE and Activity FRR' has been added to the water quality monitoring to be included.	<p>This is to signify that water quality monitoring will be included for both discharge locations, with the relevant parameters being different for each.</p> <p>The appropriate location, parameters and frequency of such monitoring will be devised further through the development and approval of</p>	Change accepted.

		this Environmental Monitoring Plan.	
	PO13 – requires confirmation of final NGR locations.		
13	Confirmation of the FRR outlet (titled outlet 3) location included.	The discharge from the FRR system is regarded a WDA (as per proposals for Table S1.1). Therefore the outlet location of this WDA must be included on the permit. As the exact location of this outlet may not be known yet, it has been added to PO13 so it can be provided once known.	Change accepted.
	PO14 – requires confirmation of the NGRs for the compliance monitoring points		
14		No edit suggested but for awareness the FRR monitoring point or points have been added to table S3.3 so will also be requirement of this PO. The specifications of this/these monitoring points will need to be confirmed via PO15.	No further comment
	PO15 – requires submission of an Effluent Monitoring Plan		
15		No edits suggested but for awareness the Effluent Monitoring Plan will need to include the monitoring of the FRR system as well as the	No further comment

		suggested impingement and entrainment monitoring to ensure theoretical entrapment predictions are validated. This is a necessity due to the current uncertainties involved in both the Appellant's and EA's assessments.	
	Additional PO (PO17)		
16	Inclusion of PO17 – requiring submission of an Impingement Monitoring Plan	<p>Whilst the EA believes this has already been covered in its proposed changes above linked to PO15 and therefore can be incorporated in to the Effluent Monitoring Plan, it is willing to agree to the addition of a separate Pre-operational condition to cover the impingement and FRR monitoring. However it must include all the aspects proposed by the EA (above) in relation to PO15 and the Effluent Monitoring Plan.</p> <p>For example, it must cover Impingement monitoring, impingement survivability, other 'in-system' mortality and be sufficient to calculate the</p>	<p>The Appellant suggests the most effective approach to understanding the impingement impacts of HPC is to design a comprehensive monitoring programme focussed on the bypass culvert / fish trap (which is the only way to conduct monitoring in the FRR system); data from which can be used to validate the modelling undertaken by HPC (CEFAS) and EA. Whilst the Appellant believes this is already covered by the post scheme appraisal requirements in PO11 the Appellant is willing to accept the inclusion of a specific PO on monitoring of the bypass culvert / fish trap. As such a proposed new PO17</p>

		<p>theoretical total daily moribund biomass discharged via the FRR outlet to a certain degree of confidence to compare against the compliance limit.</p>	<p>on Impingement Monitoring is included as a helpful way forward, and we believe that this meets the EA's stated intention of good environmental monitoring and ensuring robustness of data.</p> <p>With reference to impingement survivability and other 'in system' mortality please see comments under item 17.</p>
Table S3.1a – emission limits and monitoring requirements			
17	<p>Parameters: Impingement, Impingement survivability, Entrainment, Entrainment Survivability & Other 'in-system' mortality have been included as a monitoring requirement for Waste stream A</p>	<p>These parameters have been included with no compliance limit but monitoring requires to substantiate estimates relied on due to the current uncertainties involved in both the Appellant's and EA's assessments.</p> <p>The specifications of this monitoring will need to be devised and approved via PO15 and described with in the Effluent Monitoring Plan.</p> <p>This monitoring has been assigned to Waste stream A, as this is where these</p>	<p>The Appellant has previously explained it is not possible to monitor waste stream A. Such monitoring would interfere with the essential cooling water functions of the power station and would be a threat to nuclear safety.</p>

		<p>parameters would be sampled. However this monitoring may too inform the monitoring requirement included for Activity FRR (see below). This is due to the Impingement, Impingement Survivability & Other 'in-system' mortality being directly linked to the total moribund biomass discharged via the FRR outlet.</p>	
18	<p>Activity FRR – Waste stream H has been included. With a compliance limit of 490 kg total moribund biomass measured against a 90 day rolling average of the daily mean.</p>	<p>The discharge from the FRR system is regarded a WDA (as per proposals for Table S1.1). Therefore the regulation of this WDA must be authorised in the permit.</p> <p>The EA proposes to regulate this activity via a maximum compliance limit on the total moribund biomass that can be discharged daily. This has been set as a 'standstill limit', as in it has been devised by considering the worst case scenario assessed that resulted in suitable mixing zones within the environment (EA 2020 HRA, CD Ref: 4.1). The limit has been set as a</p>	<p>The Appellant has previously explained it is not possible to monitor the total mass of biota released from the FRR.</p> <p>Limit not accepted.</p> <p>The Appellant can only control the volume discharged via the FRR by shutting down the powerstation's cooling water system which would necessitate shutting the reactor down.</p> <p>The mass of biota in the FRR system can be sampled via the FRR fish trap, but this will only ever be a periodic sampling exercise. The mass of biota discharged from the FRR could</p>

		<p>daily mean, calculated over a 90 day rolling period. This is to take account of the daily fluctuations expected that are unlikely to influence these mixing zones, but also to capture the seasonality expected within this parameter.</p> <p>The specifications of the monitoring required to ensure compliance with this limit has yet been defined within the permit. These will need to be discussed and approved via PO15 and incorporated in to the Effluent Monitoring Plan. The monitoring may not result in direct sampling of the moribund biomass. But may use a combination of impingement monitoring and survivability surveys to calculate a theoretical biomass in an agreed way, within a certain degree of confidence for compliance purposes.</p>	<p>be inferred from such monitoring.</p> <p>The data gathered from the monitoring noted in the proposed PO17 could be used to provide a picture of the mass of biota discharged from the FRR in the course of any reporting period but the Appellant does not consider it appropriate to place a limit on such figures as in reality they cannot be controlled.</p>
	Table S3.2 Discharge points		
19	Additional discharge point included for the FRR activity, known as Outlet 3.	The discharge from the FRR system is regarded a WDA (as	Change accepted.

		<p>per proposals for Table S1.1). Therefore the discharge point of this WDA must be stipulated in the permit.</p> <p>As the exact location of this outlet may not be known yet, confirmation of the NGR has been added to PO13.</p>	
Table S3.3 Monitoring points			
20	Additional monitoring point included for the FRR activity, known as Waste stream H.	<p>The discharge from the FRR system is regarded a WDA (as per proposals for Table S1.1). Therefore the monitoring point for this WDA must be stipulated in the permit.</p> <p>As the exact location of this monitoring point may not be known yet, confirmation of the NGR has been added to PO14.</p>	See comments under item 18. The only possible sampling location in the FRR is the 'fish trap'.
Table S4.1 Reporting of monitoring data			
21	Additional reporting requirement included for the FRR activity – Waste stream H.	The discharge from the FRR system is regarded a WDA (as per proposals for Table S1.1). Therefore the reporting requirements of any monitoring	Not required - see comments under Item 18.

		<p>of this WDA must be stipulated in the permit.</p> <p>The specifics of this reporting has not yet been stipulated within the permit. These will need to be discussed and approved via PO15 and incorporated in to the Effluent Monitoring Plan.</p>	
Table S4.2 Reporting forms			
22	Additional reporting form included for the FRR activity – Waste stream H.	<p>Due to the reporting requirements as per proposals for Table S4.1, the form this reporting will be provided in must be stipulated in the permit. The specifics of this reporting have yet been stated in the permit, and although this table does not specify PO15, it is under this PO that the specifications of any forms of reporting can be discussed, agreed and described within the Effluent Monitoring Plan.</p>	Not required - see comments under Item 18.

	Schedule 7 – Site plans		
23	Additional discharge point included for the FRR activity, known as Outlet 3.	The discharge from the FRR system is regarded a WDA (as per proposals for Table S1.1). Therefore the discharge location must be identified within a site plan.	Change accepted.

This addendum to the Statement of Common Ground is signed by the Environment Agency and the Appellant

Signed:

DocuSigned by:

FDBA60C43B934AF...

Huw Williams

Senior Managing Lawyer

On behalf of the Environment Agency

Dated: 25 May 2021

Signed by **NNB Generation Company (HPC) Limited**

DocuSigned by:
Richard Savage

acting by **Richard Savage**, director

APPENDIX ONE
MARK-UP OF CONDITIONS

Conditions

1 Management

1.1 General management

- 1.1.1 The operator shall manage and operate the activities:
- (a) in accordance with a written management system that identifies and minimises risks of pollution, including those arising from operations, maintenance, accidents, incidents, non-conformances and those drawn to the attention of the operator as a result of complaints; and
 - (b) using sufficient competent persons and resources.
- 1.1.2 Records demonstrating compliance with condition 1.1.1 shall be maintained.
- 1.1.3 Any person having duties that are or may be affected by the matters set out in this permit shall have convenient access to a copy of it kept at or near the place where those duties are carried out.

2 Operations

2.1 Permitted activities

- 2.1.1 The operator is only authorised to carry out the activities specified in schedule 1 table S1.1 (the “activities”).

2.2 The site

- 2.2.1 The activities shall not extend beyond the site, being the land shown edged in green on site plans 1 and 2 at schedule 7 to this permit and the discharge shall be made at the points marked on site plan 1 at schedule 7 to this permit and as listed in table S3.2 (discharge points).

2.3 Operating techniques

- 2.3.1 (a) The activities shall, subject to the conditions of this permit, be operated using the techniques and in the manner described in the documentation specified in schedule 1, table S1.2, unless otherwise agreed in writing by the Environment Agency.
- (b) If notified by the Environment Agency that the activities are giving rise to pollution, the operator shall submit to the Environment Agency for approval within the period specified, a revision of any plan specified in schedule 1, table S1.2 or otherwise required under this permit, and shall implement the approved revised plan in place of the original from the date of approval, unless otherwise agreed in writing by the Environment Agency.

2.4 Improvement programme

- 2.4.1 The operator shall complete the improvements specified in schedule 1 table S1.3 by the date specified in that table unless otherwise agreed in writing by the Environment Agency.
- 2.4.2 Except in the case of an improvement which consists only of a submission to the Environment Agency, the operator shall notify the Environment Agency within 14 days of completion of each improvement.

2.5 Pre-operational conditions

- 2.5.1 The activities shall not be brought into operation until 31 October 2017 and until the measures specified in schedule 1 table S1.4 have been completed.

3 Emissions and monitoring

3.1 Emissions to water

- 3.1.1 There shall be no point source emissions to water except from the sources and emission points listed in schedule 3.
- 3.1.2 The limits given in schedule 3 shall not be exceeded.
- 3.1.3 Samples of the incoming and discharge water shall be taken on each sampling occasion. The difference between the discharge and incoming measurements will be calculated for each sampling occasion.

3.2 Emissions of substances not controlled by emission limits

- 3.2.1 Emissions of substances not controlled by emission limits (excluding odour) shall not cause pollution. The operator shall not be taken to have breached this condition if appropriate measures, including, but not limited to, those specified in any approved emissions management plan, have been taken to prevent or where that is not practicable, to minimise, those emissions.
- 3.2.2 All liquids in containers, whose emission to water or land could cause pollution, shall be provided with secondary containment, unless the operator has used other appropriate measures to prevent or where that is not practicable, to minimise, leakage and spillage from the primary container.

3.3 Monitoring

- 3.3.1 The operator shall, unless otherwise agreed in writing by the Environment Agency, undertake the monitoring specified in the following tables in schedule 3 to this permit:
- (a) point source emissions specified in tables S3.1a, S3.1b, S3.1c and S3.3;
 - (b) inlet quality specified in table S3.1a and S3.3;

and the environmental monitoring specified in the environmental monitoring plan approved in accordance with pre-operational measure PO11 in table S1.4 in schedule 1 to this permit.

- 3.3.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
- 3.3.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme and the environmental or other monitoring specified in condition 3.3.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate), where available, unless otherwise agreed in writing by the Environment Agency.
- 3.3.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 3 tables S3.1a, S3.1b, S3.1c, S3.2 and S3.3.

4 Information

4.1 Records

- 4.1.1 All records required to be made by this permit shall:
 - (a) be legible;
 - (b) be made as soon as reasonably practicable;
 - (c) if amended, be amended in such a way that the original and any subsequent amendments remain legible, or are capable of retrieval; and
 - (d) be retained, unless otherwise agreed in writing by the Environment Agency, for at least 6 years from the date when the records were made.
- 4.1.2 The operator shall keep on site all records, plans and the management system required to be maintained by this permit, unless otherwise agreed in writing by the Environment Agency.

4.2 Reporting

- 4.2.1 The operator shall send all reports and notifications required by the permit to the Environment Agency using the contact details supplied in writing by the Environment Agency.
- 4.2.2 A report on the performance of the activities over the previous year shall be submitted to the Environment Agency by 31 January (or other date agreed in writing by the Environment Agency) each year. The report(s) shall include as a minimum, a review of the results of the monitoring carried out in accordance with the permit including an interpretive review of that data.
- 4.2.3 A report on the performance of the activities during periods of planned maintenance when the power station is subject to operation in RF3 maintenance configuration, shall be submitted to the Environment Agency within 1 month of completion of the maintenance period (or other timeframe agreed in writing by the Environment Agency). The report need only include reference to waste stream A (as specified in table S1.1 of this permit) and shall include a review of the results of the cooling water flow and temperature monitoring carried out in accordance with the permit including an interpretive review of that data.
- 4.2.4 Within 28 days of the end of the reporting period the operator shall, unless otherwise agreed in writing by the Environment Agency, submit reports of the monitoring and assessment carried out in accordance with the conditions of this permit, as follows:

- (a) in respect of the parameters and emission points specified in schedule 4 table S4.1;
- (b) for the reporting periods specified in schedule 4 table S4.1 and using the forms specified in schedule 4 table S4.2; and
- (c) giving the information from such results and assessments as may be required by the forms specified in those tables.

4.3 Notifications

4.3.1 The Environment Agency shall be notified without delay following the detection of:

- (a) any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution;
- (b) the breach of a limit specified in the permit; or
- (c) any significant adverse environmental effects.

4.3.2 The Environment Agency shall be notified in writing at least one month in advance of any periods of planned maintenance when the power station will be subject to operation in RF3 maintenance configuration. The notification shall contain the intended start date for, and the proposed duration of the maintenance works. Confirmation of the start date shall be received in writing by the Environment Agency within 1 week of commencement of the maintenance period.

4.3.3 Any information provided under condition 4.3.1 shall be confirmed by sending the information listed in schedule 5 to this permit within the time period specified in that schedule.

4.3.4 Where the Environment Agency has requested in writing that it shall be notified when the operator is to undertake monitoring and/or spot sampling, the operator shall inform the Environment Agency when the relevant monitoring and/or spot sampling is to take place. The operator shall provide this information to the Environment Agency at least 14 days before the date the monitoring is to be undertaken.

4.3.5 The Environment Agency shall be notified within 14 days of the occurrence of the following matters, except where such disclosure is prohibited by Stock Exchange rules:

Where the operator is a registered company:

- (a) any change in the operator's trading name, registered name or registered office address; and
- (b) any steps taken with a view to the operator going into administration, entering into a company voluntary arrangement or being wound up.

Where the operator is a corporate body other than a registered company:

- (a) any change in the operator's name or address; and
- (b) any steps taken with a view to the dissolution of the operator.

1.1.2 Where the operator proposes to make a change in the nature or functioning, or an extension of the activities, which may have consequences for the environment and the change is not otherwise the subject of an application for approval under the Regulations or this permit:

- (a) the Environment Agency shall be notified at least 14 days before making the change; and
- (b) the notification shall contain a description of the proposed change in operation.

1.2 Interpretation

1.2.1 In this permit the expressions listed in schedule 6 shall have the meaning given in that schedule.

1.2.2 In this permit references to reports and notifications mean written reports and notifications, except where reference is made to notification being made "without delay", in which case it may be provided by telephone.

Schedule 1 - Operations

Table S1.1 Activities

<u>Activity reference</u>	Description of activity	Limits of specified activity
<u>CWPE</u>	Discharge of trade effluent (comprising cooling water and process effluent) and treated sewage effluent via outlets 1 & 2	<p>The activity is limited to the following waste streams, as set out in Table 2.2.1 of the permit application:</p> <ul style="list-style-type: none"> • Waste stream A - Trade effluent consisting of returned abstracted cooling water. • Waste stream B - Trade effluent from operations within the 'nuclear island', excluding effluent from the Steam Generator Blowdown System. • Waste stream C - Trade effluent from the Steam Generator Blowdown System. • Waste stream D - Trade effluent from the Turbine Hall and uncontrolled area floor drains, excluding effluent from the Steam Generator Blowdown System. • Waste stream E - Trade effluent comprising of water potentially contaminated with hydrocarbons from areas where oils are used. • Waste stream F - Trade effluent from the production of demineralised water. • Waste stream G - Domestic sewage (sanitary effluent) from administration and mess facilities.
<u>FRR</u>	<u>Discharge of trade effluent (comprising cooling water) via outlet 3</u>	<p><u>The activity is limited to:</u></p> <ul style="list-style-type: none"> • <u>Waste stream H - Trade effluent consisting of a small proportion of returned abstracted cooling water via the Fish Recovery & Return (FRR) System.</u>

Table S1.2 Operating techniques		
Description of documentation	Parts	Date Received
Environmental permit application for Hinkley Point C, application reference EPR/HP3228XT/A001 - Main document	Sections 2.3.2 - 2.3.7 - description of the treatment systems used to remove contaminants prior to discharge Section 2.6.2 - Prevention of Unplanned Emissions of Oils from Heat Exchangers Section 2.7.2 - Hot Functional Testing Section 3.1.3 – Minimisation of Impingement and Entrainment of Marine Organisms Section 3.5 - Oily Water Treatment Section 3.7.3 - Strategy for Minimising Chlorination Section 3.8 - Sanitary Effluent Section 3.11 - Outfall Design	23/09/11
Further information in response to Schedule 5 Notice	Question 25 - injection of biocide downstream of the drumscreens but before the condensers	23/12/11
Further information in response to Schedule 5 Notice	Question 46 – operation of the Acoustic Fish Deterrent (AFD) system 24 hours per day.	29/03/12
Further information in response to Schedule 5 Notice	Question 9 - maximum expected pre-dilution substance concentrations in waste streams B & C (combined), and waste stream D	29/03/12
Further information in response to Schedule 5 Notice	Question 13 - maximum expected pre-dilution substance concentrations in waste stream F	14/02/12
Emissions Management Plan	As approved in accordance with Pre-operational measure PO5 in Table S1.4	To be received in accordance with pre-operational measure submission timescales in Table S1.4
Commissioning Discharges Management Plan	As approved in accordance with Pre-operational measure PO6 in Table S1.4	
Operational strategy for the control of biofouling	As approved in accordance with Pre-operational measure PO7 in Table S1.4	
Commissioning Plan for AFD and FRR Systems	As approved in accordance with Pre-operational measure PO8 in Table S1.4	
Forebay de-silting Plan	As approved in accordance with Pre-operational measure PO9 in Table S1.4	
Hydrazine Removal Plan	As approved in accordance with Pre-operational measure PO10 in Table S1.4	
Environmental Monitoring Plan	As approved in accordance with Pre-operational measure PO11 in Table S1.4	

Table S1.2 Operating techniques		
Description of documentation	Parts	Date Received
Priority Hazardous Substances Management Plan	As approved in accordance with Pre-operational measure PO12 in Table S1.4	To be received in accordance with pre-operational measure submission timescales in Table S1.4
Effluent Monitoring Plan	As approved in accordance with Pre-operational measure PO15 in Table S1.4	
Hydrodynamic Modelling Review Plan	As approved in accordance with Pre-operational measure PO16 in Table S1.4	

Table S1.3 Improvement programme requirements		
Reference	Requirement	Date
IC1	The operator shall submit a written report to the Environment Agency on the implementation of its Environmental Management System and the progress made in the accreditation of the system by an external body or if appropriate submit a schedule by which the EMS will be subject to accreditation.	Within 12 months of the date on which the Hot Functional Testing phase of commissioning commences
IC2	<p>The operator shall review their hydrodynamic modelling for the purpose of post-scheme appraisal within 5 years of the commencement of commercial operation of Unit 2, to validate their modelling predictions. The review shall include re-calibration and validation of the hydrodynamic model(s) if necessary, as well as a reassessment of the assumptions concerning the near-field behaviour of the discharges.</p> <p>The Operator shall submit a written report to the Environment Agency on the review of their hydrodynamic modelling within 1 month of completion of the review.</p>	As specified in Improvement Condition IC2
IC3	<p>The operator shall review their hydrodynamic modelling and associated impact assessment in light of the following:</p> <ul style="list-style-type: none"> • best available climate change projections; • operational performance of the power station; • the output from post scheme appraisal studies; <p>within 5 years of the commencement of commercial operation of Unit 2 and every 10 years thereafter unless otherwise agreed in writing by the Environment Agency.</p> <p>The review will assess how the climate change projections could influence the operation of the power station in the future. The results of the review shall be reported to the Environment Agency in writing within 1 month of completion of each review.</p>	As specified in Improvement Condition IC3

Table S1.4 Pre-operational measures		
Reference	Pre-operational measures	Date
PO1	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit a summary of the site Environment Management System (EMS) to the Environment Agency and make available for inspection all documents and procedures which form part of the EMS. The EMS shall be developed in line with Part 1 of How to comply with your Environmental Permit (EPR 1.00) and Horizontal Guidance note H6 on Environmental Management Systems; and shall include an Accident Management Plan for the Water Discharge Activity. The documents and procedures set out in the EMS shall form the written management system referenced in condition 1.1.1 (a) of the permit.</p>	At least one calendar month prior to the commencement of the Hot Functional Testing phase of commissioning.
PO2	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency <u>for approval</u> a report which includes a completed, as-built description of the plant and infrastructure relevant to the Water Discharge Activities. Note that the report shall take into account the cooling water system in its entirety, including the design of the Acoustic Fish Deterrent (AFD) and Fish Recovery and Return (FRR) systems; <u>providing an update to Section 3.1.3 of the Environmental permit application for Hinkley Point C, application reference EPR/HP3228XT/A001 - Main document (received 23/09/11)</u>.</p> <p>In addition the report shall contain an updated site plan clearly showing all relevant buildings and structures and the route of the associated pipework, including all land-based infrastructure associated with the cooling water system; and the national grid references of the cooling water intakes.</p> <p>Should the final design vary from that described in the permit application, the report shall include as appropriate, a risk assessment to demonstrate how the changes will prevent or minimise impacts on the receiving water environment, and ensure compliance with this permit.</p>	At least three calendar months prior to the commencement of the Hot Functional Testing phase of commissioning.

Table S1.4 Pre-operational measures		
Reference	Pre-operational measures	Date
PO3	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency <u>for approval</u> a report which reviews the proposed substance loadings and emissions to surface water from Hinkley Point C. The report shall include, but not be restricted to the following:</p> <ul style="list-style-type: none"> • a summary of the lessons learnt through design evolution and/or commissioning and operating the EPR at Flamanville 3 in France, or any other EPR site worldwide; • information from designers and suppliers which has influenced the final design with respect to the flow and composition of effluents; • reference to outputs from the demineralisation plant (expected to be based on non-desalination technology in variance to the data provided in GDA and the permit application); • reference to outputs from the ongoing Entrainment Mimic Unit (EMU) work regarding potential impacts on entrained marine organisms. <p>The report shall validate the proposed substance loadings and emissions from Hinkley Point C, fully describing and justifying:</p> <ul style="list-style-type: none"> • any expected variances from the substance loadings and emissions proposed in the permit application; • any additional mitigation measures required to ensure compliance with this permit. 	At least three calendar months prior to the commencement of the Hot Functional Testing phase of commissioning.
PO4	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval a scoping document for development of an Emissions Management Plan, to show how emissions not covered by emission limits in Table S3.1, will be prevented, or where that is not practicable, minimised.</p>	At least three calendar months prior to the commencement of the Hot Functional Testing phase of commissioning.
PO5	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval an Emissions Management Plan in accordance with the scope agreed under PO4.</p>	At least two calendar months prior to the commencement of the Hot Functional Testing phase of commissioning.

Table S1.4 Pre-operational measures		
Reference	Pre-operational measures	Date
PO6	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency a Commissioning Discharges Management Plan. The Plan shall describe how the operator intends to undertake Hot Functional Testing (HFT). The Plan shall include, but not be restricted to the following:</p> <ul style="list-style-type: none"> • the timetable for HFT of both UK EPR units; • a description of the HFT process; • a description of associated effluent treatment measures; • confirmation of the expected substance loadings and emissions to surface water; • confirmation of the expected thermal loading, including the expected temperature of the discharge; • proposals for effluent monitoring during the HFT process. <p>The Plan should also demonstrate how the operator's management and engineering controls will ensure that substance loadings and emissions to surface water do not exceed the levels stated in the permit application, with particular reference to how:</p> <ul style="list-style-type: none"> • environmental impacts will be prevented or minimised; and • compliance with this permit will be achieved. 	At least three calendar months prior to the commencement of the Hot Functional Testing phase of commissioning.
PO7	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval a report which confirms and justifies their operational strategy for the control of biofouling of the cooling water system. The report shall include, but not be restricted to the following:</p> <ul style="list-style-type: none"> • an appraisal of the operational conditions and chlorination strategy employed at Hinkley Point B power station, and a description of how this has been taken into account in defining the proposed strategy for HPC; • the lessons learnt through design evolution and/or commissioning and operating the EPR at Flamanville 3 in France, or any other EPR site worldwide; • details of how the operational strategy has been optimised to reduce the need for chemical dosing and the subsequent discharge of TRO and the formation of chlorinated by-products (CBP^{ms}); • validation of the impacts of the proposed dosing regime, to include reference to numerical modelling and ecotoxicological studies as appropriate. 	At least three calendar months prior to the commencement of the Hot Functional Testing phase of commissioning.

Table S1.4 Pre-operational measures		
Reference	Pre-operational measures	Date
PO8	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval a Commissioning Plan for the AFD and FRR Systems. The Plan shall include, but not be restricted to the following:</p> <ul style="list-style-type: none"> • a description of how the operator intends to optimise the AFD and FRR systems to minimise impacts upon fish; • details of the monitoring proposed to facilitate optimisation and meet the above objective; • confirmation of the timetable associated with the AFD and FRR system commissioning; • proposals for demonstrating the effectiveness of the optimisation process to the Environment Agency prior to the start of Active Commissioning of Unit 1. 	At least three calendar months prior to the commencement of the Hot Functional Testing phase of commissioning.
PO9	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval a Forebay de-silting Plan for the removal of accumulated silt from within the cooling water forebays. The Plan shall include:</p> <ul style="list-style-type: none"> • verification of the initial impact assessment findings detailed in the permit application; • a Method Statement for undertaking the de-silting activity. 	At least one calendar month prior to the commencement of the Hot Functional Testing phase of commissioning.
PO10	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval a Hydrazine Removal Plan which details how hydrazine shall be removed from the effluent prior to discharge. The Plan shall include, but not be restricted to the following:</p> <ul style="list-style-type: none"> • the methodology to be followed in removing hydrazine from the discharge; • proposals for monitoring during the Hot Functional Testing phase of commissioning to demonstrate that the level of hydrazine in (i) waste streams B & C (combined), and (ii) waste stream D, is below the Limit of Detection of the analytical method, the use of which shall be approved by the Environment Agency; • proposals for on-going process monitoring to ensure that the hydrazine removal process maintains its effectiveness; • details of contingency plans to deal with equipment failure and/or breakdown, or other reasonably foreseeable incidents which may compromise the effectiveness of the hydrazine removal process. 	At least three calendar months prior to the commencement of the Hot Functional Testing phase of commissioning.

Table S1.4 Pre-operational measures		
Reference	Pre-operational measures	Date
PO11	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval an Environmental Monitoring Plan for the Severn Estuary SAC, SPA and Ramsar, for the purpose of post-scheme appraisal.</p> <p>The Plan shall propose monitoring methods to determine the physical, chemical and biological characteristics of the area potentially affected by the water discharge activity_s (including impacts related to the abstraction of cooling water), and monitoring locations and frequencies. It shall also include the procedures for assessing any effects and reporting the results of the monitoring and assessment to the Environment Agency. The Plan shall include, but not be restricted to the following aspects:</p> <ul style="list-style-type: none"> • thermal plume monitoring; • <u>subtidal and intertidal benthic ecology monitoring;</u> • <u>local population surveys of fish species;</u> • water quality monitoring <u>(with reference to Activity CWPE and Activity FRR);</u> • sediment quality monitoring; and • the quality assurance procedures in place; or • the progress towards MCERTS certification or MCERTS accreditation, unless otherwise agreed in writing by the Environment Agency, and if necessary a timetable for achieving the MCERTS standard. 	At least three calendar months prior to the commencement of the Hot Functional Testing phase of commissioning.
PO12	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval a Priority Hazardous Substances Management Plan.</p> <p>The Plan shall describe how the operator intends to manage the use of chemicals so as to gradually cease or phase out discharging Priority Hazardous Substances, in accordance with the objectives set out under the Water Framework Directive.</p> <p>The Plan will make reference to amongst other things, the cadmium and mercury which is present as trace contaminants in bulk raw materials, and will propose a timetable for the gradual phasing out of the use of such chemicals.</p>	At least one calendar month prior to the commencement of the Hot Functional Testing phase of commissioning.
PO13	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency confirmation of the final national grid references (NGR's) for</p> <p><u>a) the individual diffuser heads on the cooling water outfall tunnel, to refine the NGR's in the permit application which were submitted with a 50m limit of deviation to allow for tunnel drilling contingency;</u></p> <p><u>a)b) the Fish Recovery and Return outfall (Outlet 3);-</u></p> <p>Following written approval by the Environment Agency, the NGR's shall be deemed to be incorporated under Table S3.2 of this permit.</p>	At least one calendar month prior to the commencement of the Hot Functional Testing phase of commissioning.

Table S1.4 Pre-operational measures		
Reference	Pre-operational measures	Date
PO14	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency:</p> <ul style="list-style-type: none"> • confirmation of the NGR's for the compliance monitoring points associated with each waste stream, as listed in table S3.3; • confirmation of the monitoring point references, to be prefixed by 'M', for the waste stream compliance monitoring points; and • detailed site plan(s) showing the exact location of the waste stream compliance monitoring points. <p>Following written approval by the Environment Agency, the NGR's and monitoring point references shall be deemed to be incorporated under Table S3.3 of this permit. The site plan(s) shall be deemed to be incorporated under Schedule 7 of this permit.</p>	At least one calendar month prior to the commencement of the Hot Functional Testing phase of commissioning.
PO15	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval an Effluent Monitoring Plan which specifies the monitoring techniques and assessments to be used for monitoring of effluents under this permit. The Plan shall also include, but not be restricted to the following:</p> <ul style="list-style-type: none"> • the quality assurance procedures in place; or • the progress towards MCERTS certification or MCERTS accreditation, unless otherwise agreed in writing by the Environment Agency, and if necessary a timetable for achieving the MCERTS standard. 	At least three calendar months prior to the commencement of the Hot Functional Testing phase of commissioning.
PO16	<p>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval a Hydrodynamic Modelling Review Plan. The plan shall include a description of the sampling and monitoring regimes that will be put in place to meet the requirement of Improvement Condition IC2 in table S1.3 of this permit.</p>	At least one calendar month prior to the commencement of the Hot Functional Testing phase of commissioning.
<u>PO17</u>	<p><u>Prior to the commencement of the Hot Functional Testing phase of commissioning the operator shall submit to the Environment Agency for approval an Impingement Monitoring Plan setting out the approach to monitoring impingement via the Fish Return Gutter Bypass Culvert or Fish Trap.</u></p>	<u>At least one calendar month prior to the commencement of the Hot Functional Testing phase of commissioning.</u>

Schedule 2 - Waste types, raw materials and fuels

Wastes are not accepted as part of the permitted activities and there are no restrictions on raw materials or fuels under this schedule.

Schedule 3 – Emissions and monitoring

For the purpose of this schedule the following interpretations shall apply:

- “Daily load” shall be calculated as follows:
 - (a) for waste streams B & C (combined) and for waste stream D, by multiplying the volume of effluent released from an effluent tank by the release concentration in that effluent tank. Where more than one effluent tank is discharged per day then the daily load for each substance shall be calculated by summing the individual loads discharged from each tank;
 - (b) for cadmium and mercury arising from waste streams B & C (combined) and waste stream D, by summing the calculated loads from each contributory waste stream;
 - (c) for waste stream F, unless otherwise stated, by recording the amount of substance used in the demineralisation plant over that day.
- “Annual load” shall be calculated by summing the daily loads in a fixed calendar year from 1 January to 31 December inclusive.
- “Hourly” limits for total residual oxidant require a minimum of one sample result to be recorded should the dosing period be less than sixty minutes.
- “Percentile” limits apply over a fixed calendar year from 1 January to 31 December inclusive, with the data return for the calendar year being at least 99%.
- “Planned” (in the context of RF3 maintenance) means work that is specified within the operator’s standard maintenance schedule, whether short or long term. It does not include any un-scheduled, reactive, or emergency maintenance work.
- The maximum rate of discharge for waste stream A (Unit 1 & Unit 2 combined) shall be calculated by summing the 15-minute instantaneous or integrated flow in Unit 1 and the 15-minute instantaneous or integrated flow in Unit 2, i.e.

$$Q_{\text{UNIT 1 \& UNIT 2}} = Q_{\text{UNIT 1}} + Q_{\text{UNIT 2}}$$

where: Q refers to the 15-minute instantaneous or integrated flow

- “RF3 maintenance” means the situation when Hinkley Point C power station is operating with only three of the four main cooling water pumps (CRF pumps) running, with the remaining CRF pump under maintenance. This means that one EPR™ unit will have both of its CRF pumps running, while the other EPR™ unit will have only one of its two CRF pumps running. The increased temperature differential permitted during RF3 maintenance can only apply to one EPR™ unit at any given time, that being the EPR™ unit running with reduced pump capacity due to the maintenance work.
- The maximum temperature for waste stream A (Unit 1 & Unit 2 combined) shall be calculated by mass balance, as follows:

$$T_C = (Q_{\text{UNIT 1}} \times t_{\text{UNIT 1}}) + (Q_{\text{UNIT 2}} \times t_{\text{UNIT 2}}) / (Q_{\text{UNIT 1}} + Q_{\text{UNIT 2}})$$

where: T_C refers to the temperature of the combined flow from Unit 1 and Unit 2
 Q refers to the 15-minute instantaneous or integrated flow
 t refers to the instantaneous absolute temperature

All values for flow and temperature must be coincident in time, i.e. measured over the same time period.

- “Tidal mean” is defined as an average of 15 minute data over 12.5 hours, as computed every 15 minutes.

Table S3.1a Point Source emissions to water (other than sewer) – emission limits and monitoring requirements								
Trade effluent (comprising cooling water and process effluent) and treated sewage effluent								
<u>Activity</u>	<u>Discharge source</u>	<u>Parameter</u>	<u>Limit</u>	<u>Reference Period</u>	<u>Limit of effective range</u>	<u>Monitoring frequency</u>	<u>Compliance Statistic</u>	
<u>CWPE</u>	Waste stream A (Unit 1 & Unit 2 combined)	Maximum rate of discharge	127.0 m ³ /s	Instantaneous	N/A	N/A	Tidal mean	
			134.6 m ³ /s	Instantaneous	N/A	N/A	98 percentile	
		Temperature	35.0 degrees C	Instantaneous (spot sample)	N/A	Continuous	99.5 Percentile	
		<u>Impingement</u>	<u>N/A</u>	<u>In accordance with Effluent Monitoring Plan as approved in accordance with Pre- operational measure PO15 in Table S1.4</u>			<u>N/A</u>	
		<u>Impingement survivability</u>	<u>N/A</u>				<u>N/A</u>	
		<u>Entrainment</u>	<u>N/A</u>				<u>N/A</u>	
		<u>Entrainment survivability</u>	<u>N/A</u>				<u>N/A</u>	
		<u>Other 'in-system' mortality</u>	<u>N/A</u>				<u>N/A</u>	
		Waste stream A (Unit 1)	15-minute instantaneous or integrated flow	No limit set. Record as l/s	15 minute	N/A	Continuous	N/A
				Temperature	11.8 degrees C	Instantaneous (spot sample)	N/A	Continuous
22.2 degrees C	Instantaneous (spot sample)				During <u>planned</u> RF3 maintenance, as referred to in Schedule 3 „interpretations“	Continuous	Maximum increase compared to inlet as a tidal mean. Condition 3.1.3 applies	

	Total residual oxidant (TRO)	200 µg/l	Instantaneous (spot sample)	During periods when the cooling water is dosed with sodium hypochlorite	Hourly	Maximum
	pH	6 to 9	Instantaneous (spot sample)	N/A	N/A	Minimum and maximum
	Visible oil or grease	No significant trace present	Instantaneous (spot sample)	N/A	N/A	No significant trace

Table S3.1a Point Source emissions to water (other than sewer) – emission limits and monitoring requirements**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

<u>Activity</u>	<u>Discharge source</u>	<u>Parameter</u>	<u>Limit</u>	<u>Reference Period</u>	<u>Limit of effective range</u>	<u>Monitoring frequency</u>	<u>Compliance Statistic</u>
<u>CWPE</u>	Waste stream A (Unit 2)	15-minute instantaneous or integrated flow	No limit set. Record as l/s	15 minute	N/A	Continuous	N/A
		Temperature	11.8 degrees C	Instantaneous (spot sample)	N/A	Continuous	Maximum increase compared to inlet as a tidal mean. Condition 3.1.3 applies
			22.2 degrees C	Instantaneous (spot sample)	During <u>planned</u> RF3 maintenance, as referred to in Schedule 3 „interpretations“	Continuous	Maximum increase compared to inlet as a tidal mean. Condition 3.1.3 applies
		Total residual oxidant (TRO)	200 µg/l	Instantaneous (spot sample)	During periods when the cooling water is being dosed with sodium hypochlorite	Hourly	Maximum
		pH	6 to 9	Instantaneous (spot sample)	N/A	N/A	Minimum and maximum
		Visible oil or grease	No significant trace present	Instantaneous (spot sample)	N/A	N/A	No significant trace
	Waste streams B & C (combined)	Maximum daily discharge volume	1500 m ³ /d	Total daily volume	N/A	N/A	Maximum
		Maximum rate of discharge	35 l/s	Instantaneous	N/A	N/A	Mean
		pH	6 to 9	Instantaneous (spot sample)	N/A	N/A	Minimum and maximum

Table S3.1a Point Source emissions to water (other than sewer) – emission limits and monitoring requirements**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

Activity	Discharge source	Parameter	Limit	Reference Period	Limit of effective range	Monitoring frequency	Compliance Statistic
CWPE	Waste streams B & C (combined) cont/d...	Visible oil or grease	No significant trace present	Instantaneous (spot sample)	N/A	N/A	No significant trace
	Waste stream D	Maximum daily discharge volume	1500 m ³ /d	Total daily volume	N/A	N/A	Maximum
		Maximum rate of discharge	35 l/s	Instantaneous	N/A	N/A	Mean
		pH	6 to 9	Instantaneous (spot sample)	N/A	N/A	Minimum and maximum
		Visible oil or grease	No significant trace present	Instantaneous (spot sample)	N/A	N/A	No significant trace
	Waste stream E	Maximum daily discharge volume	240 m ³ /d	Total daily volume	N/A	N/A	Maximum
		Visible oil or grease	No significant trace present	Instantaneous (spot sample)	N/A	Daily	No significant trace
	Waste stream F	Maximum daily discharge volume	4000 m ³ /d	Total daily volume	N/A	Continuous	Maximum
		Maximum rate of discharge	46 l/s	Instantaneous	N/A	N/A	Maximum
		pH	6 to 9	Instantaneous (spot sample)	N/A	N/A	Minimum and maximum
		Visible oil or grease	No significant trace present	Instantaneous (spot sample)	N/A	N/A	No significant trace

Table S3.1a Point Source emissions to water (other than sewer) – emission limits and monitoring requirements**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

<u>Activity</u>	<u>Discharge source</u>	<u>Parameter</u>	<u>Limit</u>	<u>Reference Period</u>	<u>Limit of effective range</u>	<u>Monitoring frequency</u>	<u>Compliance Statistic</u>
<u>CWPE</u>	Waste stream G	Maximum daily discharge volume	175 m ³ /d	Total daily volume	N/A	Continuous	Maximum
		ATU-BOD as O ₂	20 mg/l	Instantaneous (spot sample)	N/A	N/A	Maximum
		Suspended solids (measured after drying at 105° C)	30 mg/l	Instantaneous (spot sample)	N/A	N/A	Maximum
		Ammoniacal nitrogen (as N)	20 mg/l	Instantaneous (spot sample)	N/A	N/A	Maximum
		Visible oil or grease	No significant trace present	Instantaneous (spot sample)	N/A	N/A	No significant trace
<u>FRR</u>	<u>Waste stream H</u>	<u>Total moribund biomass</u>	<u>490 kg</u>	<u>Daily mean (90 day rolling average)</u>	<u>In accordance with Effluent Monitoring Plan as approved in accordance with Pre-operational measure PO15 in Table S1.4</u>		<u>Maximum</u>

Table S3.1b Point Source emissions to water (other than sewer) – emission limits and monitoring requirements (ANNUAL LOADS)**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

Activity	Discharge source	Parameter	Limit (kilograms per year)	Reference Period	Limit of effective range	Monitoring frequency	Compliance Statistic
CWPE	Waste streams B & C (combined)	Boron (as B)	2448	N/A	N/A	Daily	Maximum
		Lithium hydroxide	8.73				
		Morpholine	210				
		Ethanolamine	65				
		Nitrogen (as N)	10				
		Ammoniacal nitrogen (as NH ₄ ⁺)	15				
		Phosphate (as PO ₄ ³⁻)	602.50				
		Detergents	3200				
		COD	600.95				
		Aluminium	0.41				
		Copper	0.03				
		Chromium	0.65				
		Iron	2.70				
		Manganese	0.26				
		Nickel	0.03				
		Lead	0.02				
		Zinc	0.46				
	Cadmium	N/A					
	Mercury	N/A					
	Waste stream D	Morpholine	1464	N/A	N/A	Daily	Maximum
Ethanolamine		854					
Nitrogen (as N)		10120					
Ammoniacal nitrogen (as NH ₄ ⁺)		12994					
Phosphate (as PO ₄ ³⁻)		187.50					
COD		4449					
Aluminium		4.85					

Table S3.1b Point Source emissions to water (other than sewer) – emission limits and monitoring requirements (ANNUAL LOADS)**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

Activity	Discharge source	Parameter	Limit (kilograms per year)	Reference Period	Limit of effective range	Monitoring frequency	Compliance Statistic
CWPE	Waste stream D cont/d...	Copper	0.39	N/A	N/A	Daily	Maximum
		Chromium	7.72				
		Iron	32.27				
		Manganese	3.07				
		Nickel	0.41				
		Lead	0.28				
		Zinc	5.54				
		Cadmium	N/A				
		Mercury	N/A				
	Waste streams B & C (combined) and D	Cadmium	0.37	N/A	N/A	N/A	Maximum
		Mercury	0.1				
	Waste stream F	Detergents	624	N/A	N/A	Daily	Maximum
		Amino tri - phosphonic acid (ATMP)	9100				
		Hydroxy Ethylidene Diphosphonic acid (HEDP)	890				
		Acetic acid	14				
		Phosphoric acid	12				
		Sodium polyacrylate	8030				
		Acrylic acid	165				
		Iron	46000				

Table S3.1c Point Source emissions to water (other than sewer) – emission limits and monitoring requirements (DAILY LOADS)**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

Activity	Discharge source	Parameter	Limit (kilograms per day)	Reference Period	Limit of effective range	Monitoring frequency	Compliance Statistic
CWPE	Waste streams B & C (combined)	Boron (as B)	984	N/A	N/A	Daily	Maximum
		Lithium hydroxide	4.4				
		Morpholine	75				
		Ethanolamine	15				
		Nitrogen (as N)	8				
		Ammoniacal nitrogen (as NH ₄ ⁺)	1.83				
		Phosphate (as PO ₄ ³⁻)	150				
		Detergents	270				
		COD	39.27				
		Aluminium	0.09				
		Copper	0.01				
		Chromium	0.14				
		Iron	0.60				
		Manganese	0.06				
		Nickel	0.01				
		Lead	0.01				
		Zinc	0.10				
	Cadmium	N/A					
	Mercury	N/A					
	Waste stream D	Morpholine	17.25	N/A	N/A	Daily	Maximum
Ethanolamine		9.75					
Nitrogen (as N)		320					
Ammoniacal nitrogen (as NH ₄ ⁺)		71.3					
Phosphate (as PO ₄ ³⁻)		202.5					
COD		290.7					

Table S3.1c Point Source emissions to water (other than sewer) – emission limits and monitoring requirements (DAILY LOADS)**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

Activity	Discharge source	Parameter	Limit (kilograms per day)	Reference Period	Limit of effective range	Monitoring frequency	Compliance Statistic
CWPE	Waste stream D cont/d...	Aluminium	1.01	N/A	N/A	Daily	Maximum
		Copper	0.07				
		Chromium	1.56				
		Iron	6.55				
		Manganese	0.61				
		Nickel	0.08				
		Lead	0.05				
		Zinc	1.10				
		Cadmium	N/A				
		Mercury	N/A				
	Waste streams B & C (combined) and D	Cadmium	0.005	N/A	N/A	N/A	Maximum
		Mercury	0.001				
	Waste stream F	Amino tri - phosphonic acid (ATMP)	45	N/A	N/A	Daily	Maximum
		Hydroxy Ethylidene Diphosphonic acid (HEDP)	4.50				
		Acetic acid	0.10				
		Phosphoric acid	0.10				
		Sodium polyacrylate	40				
		Acrylic acid	1				
		Iron	250				

Table S3.2 Discharge points

<u>Activity</u>	Effluent Name	Discharge Point	Discharge point NGR	Receiving water/ Environment
<u>CWPE</u>	Trade effluent (comprising cooling water and process effluent) and treated sewage effluent	Outlet 1	ST 19176 47521 Final NGR to be confirmed in accordance with pre-operational measure PO13.	Bristol Channel
		Outlet 2	ST 19128 47578 Final NGR to be confirmed in accordance with pre-operational measure PO13.	
<u>FRR</u>	<u>Trade effluent (comprising cooling water)</u>	<u>Outlet 3</u>	<u>Final NGR to be confirmed in accordance with pre-operational measure PO13.</u>	

Table S3.3 Monitoring points**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

Activity	Discharge Source	Monitoring type	Monitoring points NGR	Monitoring point reference
CWPE	Waste stream A (Unit 1)	Influent sample point	NGR's to be specified in accordance with pre-operational measure PO14.	Monitoring point references to be specified in accordance with pre-operational measure PO14.
		Effluent sample point		
		Flow monitoring point		
	Waste stream A (Unit 2)	Influent sample point		
		Effluent sample point		
		Flow monitoring point		
	Waste streams B & C (combined)	Effluent sample point		
		Flow monitoring point		
	Waste stream D	Effluent sample point		
		Flow monitoring point		
	Waste stream E	Effluent sample point		
		Flow monitoring point		
	Waste stream F	Effluent sample point		
		Flow monitoring point		
	Waste stream G	Effluent sample point		
Flow monitoring point				
FRR	Waste stream H	Effluent sample point(s)	NGRs to be specified in accordance with pre-operational measure PO14.	Monitoring point references to be specified in accordance with pre-operational measure PO14.

* All monitoring points to be appropriately labelled

Schedule 4 – Reporting

For the purposes of this schedule the following interpretations shall apply:

- Substance loading data for waste streams B & C (combined), D and F shall be reported as:
 - (a) the calculated load for each substance; and
 - (b) the corresponding effluent volume and effluent concentration;

unless monitoring is based on a record of the amount of substance used, in which case that data shall be reported.

Determinands, for which reports shall be made, in accordance with conditions of this permit, are listed below.

Table S4.1 Reporting of monitoring data					
Trade effluent (comprising cooling water and process effluent) and treated sewage effluent					
Activity	Discharge source	Determinand	Monitoring point reference	Reporting period	Period begins
CWPE	Waste stream A	15-minute instantaneous or integrated flow	Monitoring point references to be specified in accordance with pre-operational measure PO14.	Quarterly, plus annual summary	1 st of month
		Temperature			
		Total Residual Oxidant (TRO)			
	Waste streams B & C (combined)	Boron (as B)		Quarterly, plus annual summary	1 st of month
		Lithium hydroxide			
		Morpholine			
		Ethanolamine			
		Nitrogen (as N)			
		Ammoniacal nitrogen (as NH ₄ ⁺)			
		Phosphate (as PO ₄ ³⁻)			
		Detergents			
		COD			
		Aluminium			
		Copper			
		Chromium			
Iron					
Manganese					
Nickel					

Table S4.1 Reporting of monitoring data**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

Activity	Discharge source	Determinand	Monitoring point reference	Reporting period	Period begins	
CWPE	Waste streams B & C (combined) cont/d...	Lead	Monitoring point references to be specified in accordance with pre-operational measure PO14.	Quarterly, plus annual summary	1 st of month	
		Zinc				
		Cadmium				
		Mercury				
	Waste stream D	Morpholine		Monitoring point references to be specified in accordance with pre-operational measure PO14.	Quarterly, plus annual summary	1 st of month
		Ethanolamine				
		Nitrogen (as N)				
		Ammoniacal nitrogen (as NH ₄ ⁺)				
		Phosphate (as PO ₄ ³⁻)				
		COD				
		Aluminium				
		Copper				
		Chromium				
		Iron				
		Manganese				
		Nickel				
		Lead				
		Zinc				
		Cadmium				
	Mercury					
	Waste stream F	Maximum daily discharge volume	Monitoring point references to be specified in accordance with pre-operational measure PO14.	Quarterly, plus annual summary	1 st of month	
		Amino tri -phosphonic acid (ATMP)				
		Hydroxy Ethylidene - Diphosphonic acid (HEDP)				
Acetic acid						
Phosphoric acid						
Sodium polyacrylate						
Acrylic acid						
Iron						

Table S4.1 Reporting of monitoring data**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

Activity	Discharge source	Determinand	Monitoring point reference	Reporting period	Period begins
<u>CWPE</u>	Waste stream G	Maximum daily discharge volume		Quarterly, plus annual summary	1 st of month
<u>FRR</u>	<u>Waste stream H</u>	<u>Total moribund biota biomass</u>	<u>Monitoring point references to be specified in accordance with pre-operational measure PO14.</u>	<u>In accordance with Effluent Monitoring Plan as approved in accordance with Pre-operational measure PO15 in Table S1.4</u>	

Table S4.2 Reporting forms			
Trade effluent (comprising cooling water and process effluent) and treated sewage effluent			
Activity	Discharge source	Determinand	Reporting format
CWPE	Waste stream A	15-minute instantaneous or integrated flow	WISKI electronic format specified by the Environment Agency
		Temperature	Electronic format specified by the Environment Agency
		Total Residual Oxidant (TRO)	
	Waste streams B & C (combined)	Boron (as B)	Electronic format specified by the Environment Agency
		Lithium hydroxide	
		Morpholine	
		Ethanolamine	
		Nitrogen (as N)	
		Ammoniacal nitrogen (as NH ₄ ⁺)	
		Phosphate (as PO ₄ ³⁻)	
		Detergents	
		COD	
		Aluminium	
		Copper	
		Chromium	
		Iron	
		Manganese	
		Nickel	
	Lead		
	Zinc		
	Cadmium		
Mercury			
Waste stream D	Morpholine	Electronic format specified by the Environment Agency	
	Ethanolamine		
	Nitrogen (as N)		
	Ammoniacal nitrogen (as NH ₄ ⁺)		
	Phosphate (as PO ₄ ³⁻)		
	COD		
	Aluminium		
	Copper		
	Chromium		
Iron			

Table S4.2 Reporting forms**Trade effluent (comprising cooling water and process effluent) and treated sewage effluent**

Activity	Discharge source	Determinand	Reporting format
CWPE	Waste stream D cont/d...	Manganese	Electronic format specified by the Environment Agency
		Nickel	
		Lead	
		Zinc	
		Cadmium	
		Mercury	
	Waste stream F	Maximum daily discharge volume	WISKI electronic format specified by the Environment Agency
		Amino tri -phosphonic acid (ATMP)	Electronic format specified by the Environment Agency
		Hydroxy Ethylidene - Diphosphonic acid (HEDP)	
		Acetic acid	
		Phosphoric acid	
		Sodium polyacrylate	
		Acrylic acid	
Iron			
Waste stream G	Maximum daily discharge volume	WISKI electronic format specified by the Environment Agency	
FRR	Waste stream H	Total moribund biota biomass	Electronic format specified by the Environment Agency

Schedule 5 - Notification

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements shall be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

If any information is considered commercially confidential, it should be separated from non-confidential information, supplied on a separate sheet and accompanied by an application for commercial confidentiality under the provisions of the EP Regulations.

Part A

Permit Number	
Name of operator	
Location of Facility	
Time and date of the detection	

(a) Notification requirements for any malfunction, breakdown or failure of equipment or techniques, accident, or emission of a substance not controlled by an emission limit which has caused, is causing or may cause significant pollution	
To be notified within 24 hours of detection	
Date and time of the event	
Reference or description of the location of the event	
Description of where any release into the environment took place	
Substances(s) potentially released	
Best estimate of the quantity or rate of release of substances	
Measures taken, or intended to be taken, to stop any emission	
Description of the failure or accident.	

(b) Notification requirements for the breach of a limit	
To be notified within 24 hours of detection unless otherwise specified below	
Emission point reference/ source	
Parameter(s)	
Limit	
Measured value and uncertainty	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Time periods for notification following detection of a breach of a limit	
Parameter	Notification period

(c) Notification requirements for the detection of any significant adverse environmental effect	
To be notified within 24 hours of detection	
Description of where the effect on the environment was detected	
Substances(s) detected	
Concentrations of substances detected	
Date of monitoring/sampling	

Part B - to be submitted as soon as practicable

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission	
The dates of any unauthorised emissions from the facility in the preceding 24 months.	

Name*	
Post	
Signature	
Date	

* authorised to sign on behalf of the operator

Schedule 6 - Interpretation

"accident" means an accident that may result in pollution.

"annually" means once every year.

"application" means the application for this permit, together with any additional information supplied by the operator as part of the application and any response to a notice served under Schedule 5 to the EP Regulations.

"EP Regulations" means The Environmental Permitting (England and Wales) Regulations SI 2010 No.675 and words and expressions used in this permit which are also used in the Regulations have the same meanings as in those Regulations.

"emissions of substances not controlled by emission limits" means emissions of substances to air, water or land from the activities, either from the emission points specified in schedule 3 or from other localised or diffuse sources, which are not controlled by an emission limit.

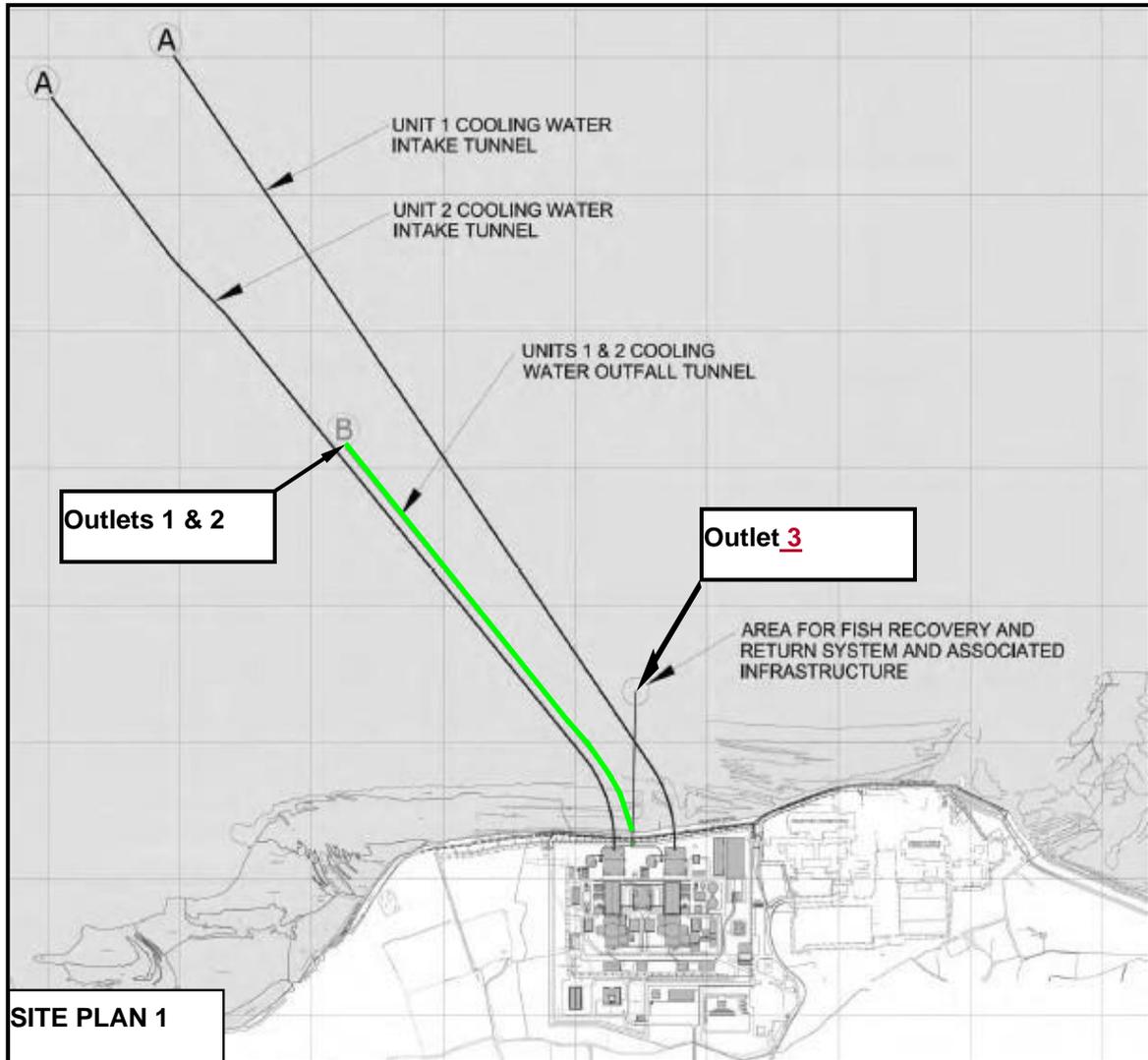
"groundwater" means all water, which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.

"MCERTS" means the Environment Agency's Monitoring Certification Scheme.

"quarter" means a calendar year quarter commencing on 1 January, 1 April, 1 July or 1 October. "year"

means calendar year ending 31 December.

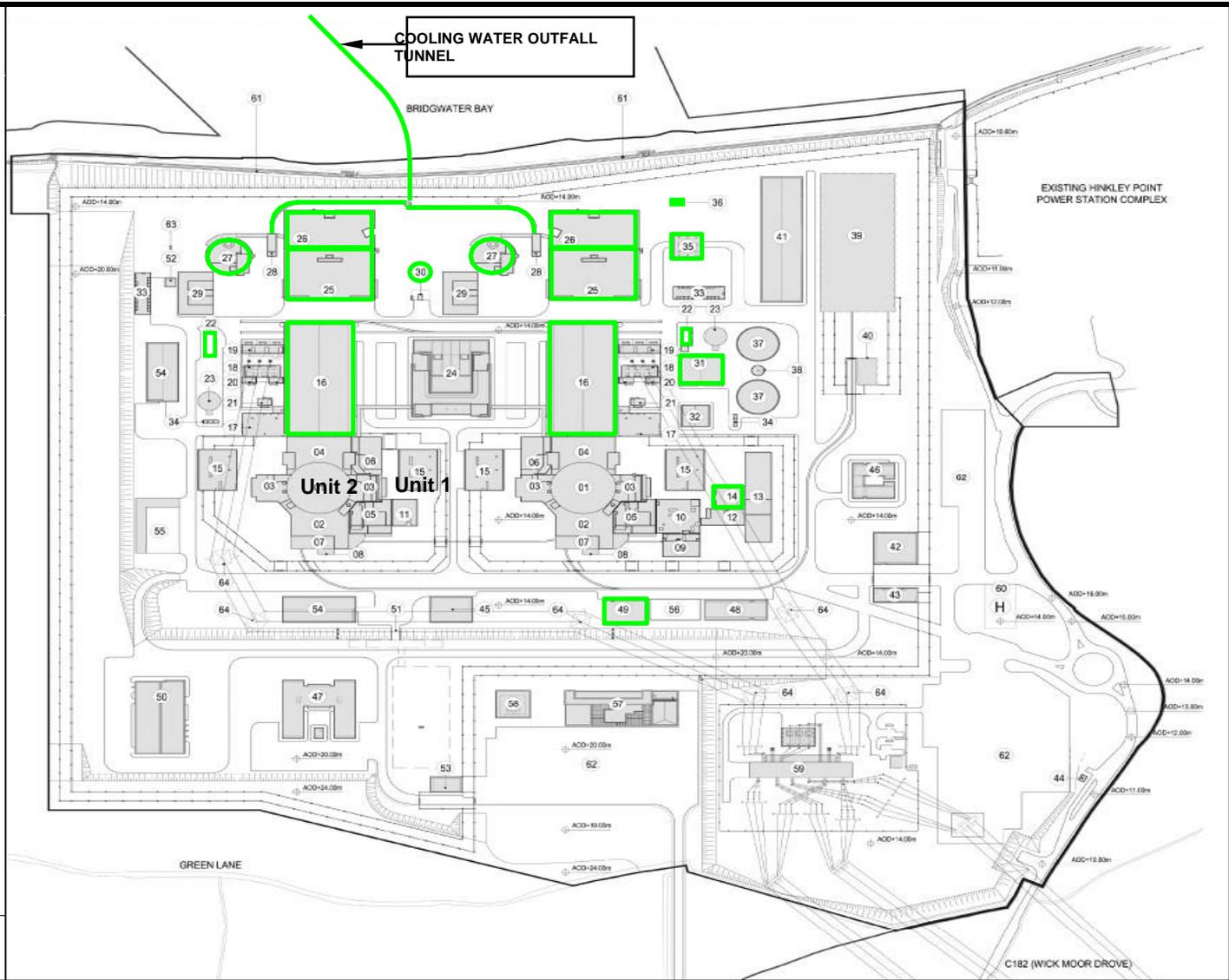
Schedule 7 – Site plans



KEY to buildings and structures

- 14 - Effluent tanks (waste streams B, C & D)
- 16 - Turbine Halls (waste stream A)
- 22 - Hydrazine and ammonia storage
- 25 - Cooling water pumphouses
- 26 - Cooling water forebays
- 27 - Outfall ponds (all waste streams)
- 30 - Attenuation pond (waste stream E)
- 31 - Demineralisation station (waste stream F)
- 35 - Chemicals storage
- 36 - Sewage treatment plant (waste stream G)
- 49 - Oil & grease storage and oil ancillary building

SITE PLAN 2



END OF PERMIT.

 25 May 2021

 25 May 2021

APPEAL BY NNB GENERATION COMPANY (HPC) LIMITED (the “APPELLANT”)

WATER DISCHARGE ACTIVITY AT HINKLEY POINT C, SOMERSET

PERMIT VARIATION APPLICATION RELATING TO ACOUSTIC FISH DETERRENT

APPEAL REF: APP/EPR/573

**ADDENDUM TO STATEMENT OF COMMON GROUND
GLOSSARY AGREED BETWEEN APPELLANT AND EA**

Appreciations & Acronyms	
AA	Appropriate Assessment
ADCP	Acoustic Doppler Current Profiler
AFD	Acoustic Fish Deterrent
ALARP	As low as reasonably practicable
APEM	Environmental consultancy specialising in terrestrial, freshwater and marine ecology and aerial surveys. Research contractor for the EA
B _{lim}	A limit reference point for spawning stock biomass, below which a stock is considered to have reduced reproductive capacity
BAT	Best Available Technique
BEEMS	Formerly British Energy Estuarine & Marine Studies
Cefas	Centre for Environment Fisheries and Aquatic Science, which acted as a research contractor for the Appellant
CEGB	Central Electricity Generating Board
CIMP	Comprehensive Impingement Monitoring Programme. a monitoring study consisting of 24 hour samples of impinged fish conducted over a 12-month period (40 samples collected from February 2009 to January 2010) at Hinkley Point B
CJEU	Court of Justice of the European Union
CL	Conservation limit
CPUE	Catch per unit effort
CWS	Cooling water system
D&S IFCA	Devon & Severn Inshore Fisheries and Conservation Authority
DCO	Development Consent Order
EA	Environment Agency
EAV	Equivalent Adult Value
EMS	European Marine Site
EPR	EPR is a third generation pressurised water reactor design. In Europe this reactor design was called European Pressurised Reactor, and the internationalised name was Evolutionary Power Reactor, but it is now simply named EPR
F	Fishing mortality
FIAT	Feature Impact Assessment Templates
FRR	Fish recovery and return system
GETM	General Estuarine Transport Model
HAWG	Herring Assessment Working Group for the Area South of 62°N
HPA	Hinkley Point A
HPB	Hinkley Point B

HPC	Hinkley Point C
HRA	Habitats Regulations Assessment
ICES	International Council for Exploration of the Sea
IFCA	Inshore Fisheries and Conservation Authorities
IROPI	Imperative Reasons of Overriding Public Interest
IUCN	International Union for Conservation of Nature
LVSE	Low Velocity Side Entry
M	Natural mortality
MHWS	Mean High Water Springs
MMO	Marine Management Organisation
MSW	Multi-sea-winter fish
NASCO	North Atlantic Salmon Conservation Organisation
NE	Natural England
NNB	Nuclear New Build
NRW	Natural Resources Wales
NSIP	Nationally Significant Infrastructure Project
OCS	Operational Catchment Services
PELTIC	Pelagic ecosystem survey in the Western Channel and Celtic Sea
PoE	Proof of Evidence
QIA	Quantitative Impact Assessment
RIMP	Routine Impingement Monitoring Programme. a long-term 37 year (1981-2017) dataset, consisting of monthly samples collected over a 6 hour period, during daylight, at HPB
ROV	Remotely Operated Vehicles
SAC	Special Area of Conservation designated under Council Directive 92/43/EEC (the " Habitats Directive ");
SNCB	Statutory Nature Conservation Body
SoC	Statement of Case
SoCG	Statement of Common Ground
SPA	Special Protection Area designated pursuant to the Wild Birds Directive (2009/147/EC)
SPF	Spawning Production Foregone
SPP	Scientific Position Paper prepared by Cefas on behalf of the Appellant
SSB	Spawning Stock Biomass
STP	Severn Tidal Power
STT	Selected Tidal Transport
SZC	Sizewell C
TAC	Total allowable catch
TB	Technical Briefs prepared by the Environment Agency
TR	Technical Report prepared by Cefas on behalf of the Appellant
UtS	Unlocking the Severn
WDA permit or OWDA	Hinkley Point C Water Discharge Activity Environmental Permit (EPR/HP3228XT) dated 13 March 2013
Definitions	
Age class	All the fish of a stock spawned or hatched in a given year. Synonym for 'Year class'
Amphidromous	Refers to fishes that regularly migrate between freshwater and the sea (in both directions), but not for the purpose of breeding, as in anadromous and catadromous species. Sub-division of diadromous. Migrations should be cyclical and predictable and cover more than 100 km
Anadromous	Fishes that live in the sea and return to freshwater to spawn. Sub-division of diadromous.
Benthopelagic	Living and feeding near the bottom as well as in midwaters or near the surface
Biomass	Mass of living biological organisms in a given area or ecosystem at a given time

Bootstrapping / bootstrapped	Statistical method for resampling a single dataset to create many simulated samples. It was applied to impingement data to calculate mean and percentiles for impingement rates.
Catadromous	Fishes that live in freshwater but enter the sea to spawn. Sub-division of diadromous
Celtic Sea	The area of the Atlantic Ocean off the south coast of Ireland.
Clupeid	A type of fish including herring, sprat and shads
Cohort	all the fish of a stock spawned or hatched in a given period, usually one year. If the period is one year then cohort is a synonym for 'Year class' or 'Age class'
Compensation	[in a fish population] increases in population growth and/ or recruitment, and/ or reductions in natural mortality, that compensate for additional mortality. In a fisheries context, these are population responses to fishing mortality.
Cumec	A cubic metre per second, as a unit rate of flow of water
Data storage tag (DST)	a combination of a data logger and multiple sensors that record environmental data at predetermined intervals. DSTs usually have a large memory size and a long lifetime: most are supported by batteries that allow the tag to record depth, day length and other data for several years. Data collected by the DST can be used to estimate position and reconstruct behavioural and migratory movements
Demersal	Fish living on, or near the bottom
Diadromous	Fish that spend part of their lives in freshwater and part in saltwater
Drum and band screens	Systems to filter the cooling water removing fish and debris.
EAV methods	A class of methods to calculate the numbers of fish that would be expected to survive naturally to enter the spawning population had they not been killed by entrainment or impingement
EAV factor	The multiplication factor that is applied to the number of fish impinged across all life stages to estimate the equivalent adults lost.
Ebb tide	The stage of the tidal cycle when the water level is falling
Embryogenesis	Egg development
Empirical	Based on observations
Entrained	organisms (including fish eggs, larvae and other plankton) that pass through the whole cooling water system and are discharged back into the Bristol Channel
Entrainment	Entrainment is the passage of biota, too small to be filtered by the drum and band screen, through the cooling water system. This includes plankton, fish eggs, larvae and some juvenile stages
Entrapment	Entrapment refers to the entry of marine organisms into the intake heads regardless of the route they then take through the rest of the cooling water system. In an assessment context entrapment is the sum of entrainment and impingement.
Epibenthic	Organisms living on or near the bottom sediments
Fecundity	The number of eggs produced
Fish recovery and return system	A means by which individuals impinged will be mechanically removed from the screens and returned to the Severn Estuary
Fish stock assessments	a method used to estimate the status of a fish stock and the rate at which it is fished
Fishing mortality	loss of fish from a population due to fishing
Flood tide	The stage of the tidal cycle when the water level is rising
Gadoids	Group of bony fish contains several commercially important fishes, including the cod, haddock, whiting, and pollock.
Genome	The complete set of genes or genetic material present in a cell or organism
Grilse	A returning adult salmon that has spent one winter at sea
Group	all the fish of a stock spawned or hatched in a given year. Often denoted with the year prefix e.g. 0-group, 1-group. Synonym for 'Year class'
Habitats Directive	Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017 (as amended)

Hindcast	A way of testing a mathematical model. Known or closely estimated inputs for past events are entered into the model to see how well the output matches the known results
Hybridisation / hybridise	The successful breeding of two different species, to produce offspring that are hybrids (such as Twaite shad breeding with Allis shad to produce shad hybrids)
ICES fish stock assessments	Stock assessments conducted by the International Council for the Exploration of the Sea (ICES)
Impingement	the retention of fish or other marine organisms on the surface of filtration screens by the water current (typically includes juvenile adult fish, shrimp and crabs).
Indeterminate (growth)	Growth that is not terminated at any biological stage
Intake velocity cap factor	One of the family of scaling factors used to estimate the impingement due to HPC relative to the HPB. The intake velocity cap factor relates specifically to the reduction in impingement due to minimising the vertical velocity draw down of the intake.
Iteroparous species	fish species that are repeat spawners i.e. have the potential to spawn year after year
Kelt	A spawned adult salmon, with the potential to become a returning adult in subsequent years
Length frequency	a distribution of the numbers of individual fish recorded in body length classes
LVSE factor	One of the family of scaling factors used to estimate the impingement due to HPC relative to the HPB. The LVSE factor relates specifically to the intake shape and geometry
Maturity	is reached when a fish is able to spawn for the first time
Maximum sustainable yield	the maximum yield that can be continuously taken, on average, from a stock under existing environmental conditions while maintaining long-term productivity
Mean High Water Springs	Is the average throughout the year, of two successive high waters, during a 24-hour period in each month when the range of the tide is at its greatest (Spring tides).
Metapopulation	A group of spatially separated populations of the same species which interact at some level
Monte Carlo	Statistical technique by which a quantity is calculated repeatedly, using randomly selected "what-if" scenarios for each calculation. These results approximate the full range of possible outcomes, and the likelihood of each.
Multi-sea-winter fish	A returning adult that has spent more than one winter at sea
Natal stream or river	Stream or river of birth
Natural Mortality	loss of fish due to predation and starvation, including disease and senescence (includes non-fishing human activities such as pollution)
Neap tides	A period of moderate tides occurring 7 days after a spring tide
Nursery area	an area where young fish grow
Parr	Juvenile salmon from the end of their first summer to their migration to sea
Pelagic	Fish associated with the surface or middle of the water column; and not in association with the seabed.
Population	Many individuals of the same species that have the potential to interbreed as adults and live in the same geographical area at the same time. In fisheries science: a unit of interbreeding individuals of the same species within which birth and death rates have a far greater influence on abundance and dynamics than immigration and emigration
Post-smolt	Salmon from its departure from the river to the end of its first winter at sea
Principal Salmon River	A principal salmon river is defined as having had an annual rod catch in excess of 50 per year when the National Rivers Authority (now EA) Salmon Strategy was released in 1996
Proxy species	A species used to represent other fish that play a similar role within the assemblage of fish species. For example common goby, black goby and rock goby are assessed by proxy of sand goby as the most abundantly captured goby species

Qualitative	Descriptive assessment where quantitative (i.e. numerical) evidence is not available.
Quantitative	Assessment based on numerical data such as modelling or survey data.
Ramsar	A site designated under the criteria of the Ramsar Convention on Wetlands of International Importance
Recruitment	The number of fish reaching a specified stage of the life cycle at a given point in time (often an age close to the age at first maturity or the age when fish are first caught in a fishery).
Returning adult	An adult salmon returning to the river to spawn
River / site fidelity	Returning to the same river to spawn
Selective tidal stream transport	To move with the tide, taking advantage of the ebb or flood tide to move more rapidly through the estuary
Semelparity	Spawning only once during the lifetime of a fish
Semelparous species	Fish species which spawn once and then (usually) die
Slack water / tide	The period of time at the turn of the tide, at either high water or low water, when there is little or no horizontal or vertical motion of the tidal water.
Smolt	Juvenile salmon migrating to sea
Spawners	Sexually mature fish
Spawning stock biomass	Total weight of all sexually mature fish in the stock
Spring tides	A tide just after a new or full moon, when there is the greatest difference between high and low water.
Spring-neap tidal cycle	The period covered by a spring tide and neap tide, lasting 30 days
Stock	The term "stock" is treated as synonymous with the term "population" for the species considered in this inquiry.
Subpopulation	Geographically or otherwise (e.g. genetically) distinct groups in a population with less exchange between groups than within them
Total mortality	Mortality attributed to both fishing and natural causes
Total stock biomass	The total stock of a fish species present in a water body at a point in time expressed as total biomass
Volumetric Scaling Factor	The ratio of the volume abstracted at HPC versus HPB
Year class	All the fish of a stock spawned or hatched in a given year
Young-of-year	All of the fish in a population younger than one year of age.