Department for
Business, Energy
& Industrial Strategy

Southampton to London Pipeline Project

Development Consent Order

Regulation 63 of the Conservation of Habitats and Species Regulations 2017

October 2020

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1 Introduction

1.1 Background

This is a record of the Habitats Regulations Assessment ("HRA") that the Secretary of State for Business, Energy and Industrial Strategy has undertaken under the Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations") and relevant parts of the Birds Directive[1] in respect of the Development Consent Order ("DCO") for the Southampton to London Pipeline Project and its associated infrastructure (the "Project"). For the purposes of these Regulations the Secretary of State is the competent authority and the public authority.

Esso Petroleum Company, Limited ("The Applicant") is making an application for development consent to replace 97 km (60 miles) of its existing 105 km (65 miles) aviation fuel pipeline that runs from the Fawley Refinery near Southampton, to the Applicant's West London Terminal storage facility in Hounslow. The Applicant has already replaced 10 km of pipeline between Hamble and Boorley Green in Hampshire. The replacement pipeline starts near Boorley Green at the end point of the previously replaced pipeline. The route runs generally in a northeast direction via Esso's Pumping Station in Alton.

The proposed Project lies within the following local authorities: Eastleigh Borough Council ("BC"); Winchester City Council; East Hampshire District Council ("DC"); Hart DC; Rushmoor BC; Surrey Heath BC; Runnymede BC; Spelthorne BC and the London Borough of Hounslow. It will be located within the administrative districts of Hampshire County Council ("CC"), Surrey CC and the Greater London Authority (GLA). Furthermore, part of the route will be located within the South Downs National Park ("SDNP") which is managed by the South Downs National Park Authority ("NPA"). The site is wholly in England. The Project application is described in more detail in Section **Error! Reference source not found.**.

The Project constitutes a nationally significant infrastructure project ("NSIP") as defined by s21(1) of the Planning Act 2008 ("PA2008") and so requires development consent in accordance with s31 of PA2008. The Project therefore meets the definition of an NSIP as set out in s14(1)(g) of PA2008.

The Project was accepted by the Planning Inspectorate ("PINS") on the 25th of June 2019 and a four-member Panel of Inspectors ("the Panel") was appointed as the Examining Authority ("ExA") for the application. The examination of the Project application began on the 9th of October 2019 and concluded on the 9th of April 2020. The Panel submitted its report of the examination, including its recommendation ("the ExA's Report"), to the Secretary of State on 7th July 2020.

1.2 Habitats Regulations Assessment (HRA)

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive") and Council Directive 2009/147/EC on the conservation of wild birds ("the Birds Directive") aim to ensure the long-term conservation of certain species and habitats by protecting them from possible adverse effects of plans and projects.

The Habitats Directive provides for the designation of sites for the protection of habitats and species of European importance. These sites are called Special Areas of Conservation ("SACs"). The Birds Directive provides for the classification of sites for the protection of rare and vulnerable birds and for regularly occurring migratory species within the EU. These sites are called Special Protection Areas ("SPAs"). SACs and SPAs are collectively termed European sites and form part of a network of protected sites across Europe. This network is called Natura 2000.

The Convention on Wetlands of International Importance 1972 ("the Ramsar Convention") provides for the listing of wetlands of international importance. These sites are called Ramsar sites. Government policy is to afford Ramsar sites in the United Kingdom the same protection as European sites.

[1] Council Directive 2009/147/EC of 3 November 2009 on the conservation of wild birds.

Regulation 63 of the Conservation of Habitats and Species Regulations 2017 provides that:

….before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which (a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in-combination with other plans or projects), and (b) is not directly connected with or necessary to the management of that site, [the competent authority] must make an appropriate assessment of the implications for that site in view of that site's conservation objectives.

And that: *In the light of the conclusions of the assessment, and subject to regulation 64 [IROPI], 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).*

This application is not directly connected with, or necessary to, the management of a European site or a European marine site. The Habitats Regulations require that, where the project is likely to have a significant effect ("LSE") on any such site, alone or in-combination with other plans and projects, an appropriate assessment ("AA") is carried out to determine whether or not the project will have an adverse effect on the integrity of the site in view of that site's Conservation Objectives. In this document, the assessments as to whether there are LSEs, and, where required, the AAs, are collectively referred to as the HRA.

The Secretary of State's conclusions on habitats and wild bird issues contained in this report have been informed by evidence from the application documents and consultation responses, which are available on the Planning Inspectorate's Nationally Significant Infrastructure Project web pages[2]. In particular:

- The ExA's Report;
- The Report on the Implications for European Sites) ("RIES")[3];
- The Applicant's Environmental Statement ("ES");
- The Applicant's Technical Note ISH5-16 [4].

Plus other documents submitted during the Examination.

Key information from these documents is summarised and referenced in this report.

1.3 RIES and Statutory Consultation

Under the Habitats Regulations and the Offshore Habitats Regulations the competent authority must, for the purposes of an AA, consult the appropriate nature conservation body and have regard to any representation made by that body within such reasonable time as the authority specifies. Natural England ("NE") is the Statutory Nature Conservation Body ("SNCB") for England and for English waters within the 12 nm limit.

Where LSEs upon Natura 2000 sites have been identified a RIES is provided by the ExA, with support from the Planning Inspectorate's Environmental Services Team. It is based on matrices provided by the Applicant and relevant information provided by Interested Parties. The RIES is designed to document the information received during the examination up until that point and presents the ExA's understanding of the main facts regarding the HRA to be carried out by the Secretary of State.

[2] https://infrastructure.planninginspectorate.gov.uk/projects/south-east/southampton-to-london-pipeline-project/?ipcsection=docs

[3] Report on the Implications for European Sites (RIES) Issued by the Examining Authority – 12 March 2020. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-000759-20200312%20EN070005%20SLP%20-%20Report%20on%20the%20Implications%20for%20European%20Sites%20(RIES).pdf

[4] Appendix 1 in Deadline 6 Submission - 8.85 Response to Action Points from Issue Specific Hearing on Environmental Matters (ISH5) - Revision 1.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001313-8.85%20Response%20to%20Action%20Points%20from%20Issue%20Specific%20Hearing%20on%20Environmental%20Matters%20(ISH5).pdf

The ExA prepared a RIES, with support from the Planning Inspectorate's Environmental Services Team. The purpose of the RIES was to compile, document and signpost information submitted by the Applicant and IPs during the Examination (up to and including Deadline 6 of the Examination (5 March 2020)) in relation to potential effects on European Sites. The RIES was published on the Inspectorate's website on 12 March 2020. Consultation on the RIES was undertaken between 12 March 2020 and 2 April 2020. The RIES was issued to ensure that NE, as the SNCB, had been formally consulted on HRA matters and to give other parties an opportunity to comment. The RIES consultation processes may be relied upon by the Secretary of State for the purposes of Regulation 63(3) of the Habitats Regulations.

The Secretary of State is content to accept the ExA's recommendation that the RIES, and consultation on it, represents an appropriate body of information to enable the Secretary of State to fulfil his duties in respect of European sites.

2 Project description

The Project is described within Chapter 3 of the Applicant's Environmental Statement[5]. The Project has been subject to minor modifications to its route and construction plans during the course of the ExA's examination.

The Project comprises a cross-country pipeline (Figure 1). The Project will run from Boorley Green in Hampshire to the Applicant's west London terminal in the London Borough of Hounslow and will consist of:

- 97 km of new steel pipeline, approximately 300 mm in diameter to be buried underground;
- Remotely operated in-line valves along the Proposed Pipeline route to allow isolation of sections of pipeline for maintenance or in case of emergency;
- New 'pigging' station at Boorley Green to allow the entry and exit points for Pipeline Inspection Gauges ("PIGs") from time to time;
- Single replacement external pump at Alton Pumping Station and modifications to the pigging station at the Esso West London Terminal storage facility including installation of a new PIG receiver and connection to the new pipeline;
- Temporary construction compounds;
- Temporary logistic hubs;
- Temporary construction accesses;
- Permanent accesses in connection with the operation of the in-line valves; and
- Other Project works including site preparation works; installation of wires, cables, conductors, pipes and ducts; establishment of winching points and temporary scaffolding; a number of works in relation to the Proposed Pipeline, in-line valves and 'pigging' stations such as surveys and investigations, fencing, aerial markers, cathodic protection test posts, cathodic protection and rectifier cabinets, sacrificial anodes and field boundary markers; street works; altering of land to facilitate the construction works; and landscaping works.

The replacement pipeline will be buried underground for its entire length. The minimum depth from the top of the pipe to the ground surface will be 1.2 m in open cut sections, and deeper for trenchless crossings. A slightly shallower depth may conceivably be necessary in exceptional circumstances, but all indications are that this will not be required. The pipeline will also be buried deeper, typically 1.5 m from top of pipe to ground surface, in roads and streets to account for other existing infrastructure such as utility pipes, cables and sewers.

The working corridors (the Order Limits) are generally between 30 m and 36 m wide depending on the proximity of existing pipelines and to allow flexibility for detailed routeing and construction methodologies for pipeline installation. A wider working width may be required at some locations, for example, the Order Limits are wider where the geology requires more working area. Where specific width restrictions exist, for example for highway works or in or near sensitive ecological areas, the working width will be narrowed. To reduce vegetation loss, the project includes an overarching commitment to only utilise a 10 m width when crossing through boundaries between fields where these include hedgerows, trees or watercourses.

[5] 6.2 Environmental Statement - Chapter 3 Project Description. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-000161-6.2%20Chapter%203%20Project%20Description.pdf

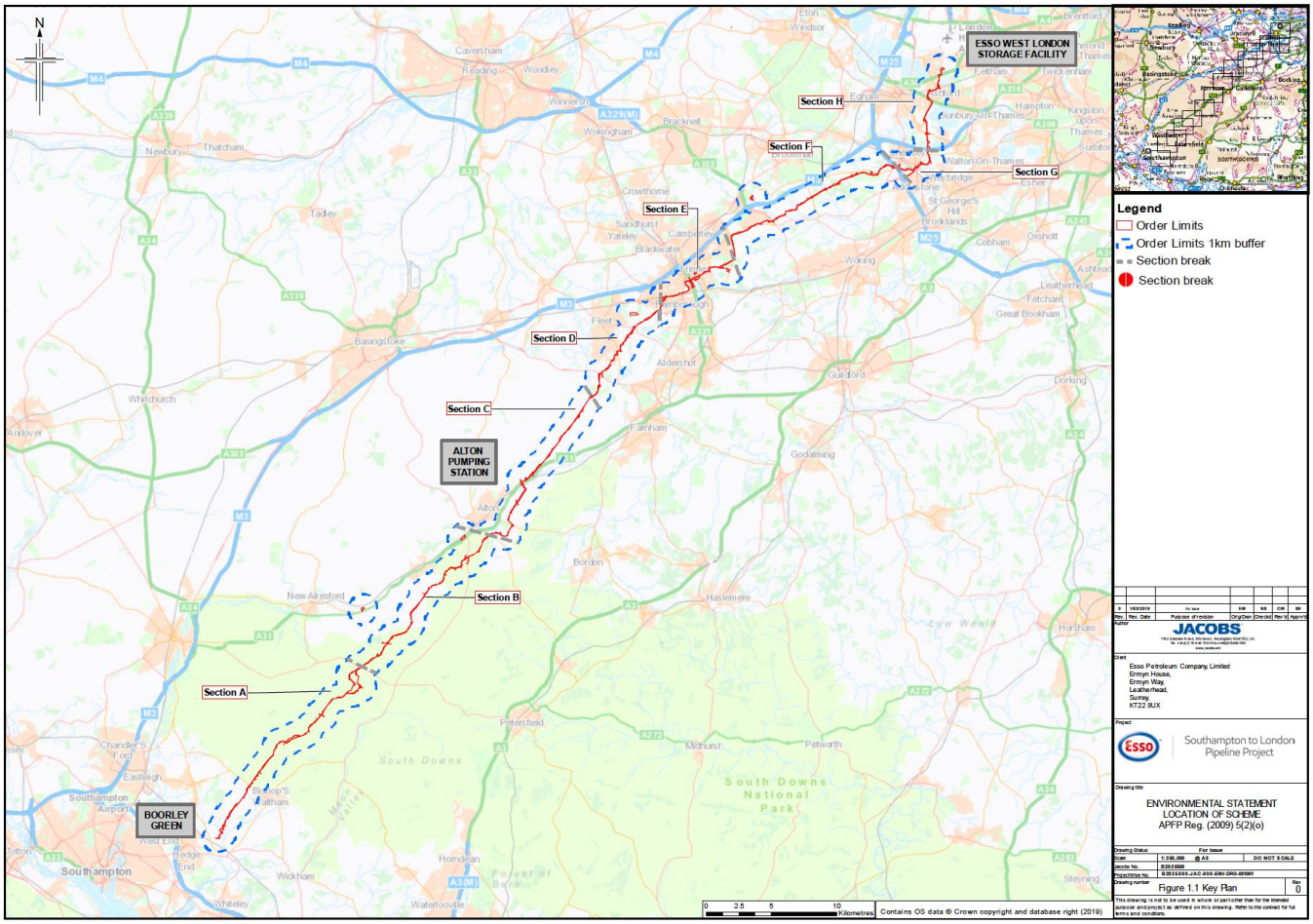

Figure 1: Location of Southampton to London Pipeline[6].

2.1 Construction Activities

Construction activities identified as having the potential to impact on designated sites relevant to this HRA include:

Working area preparation – Activities include the opening of access to field boundaries, installing temporary water courses and the pruning and protection of trees.

Temporary fencing - Provision of additional fencing on a site by site basis may be used to reduce the potential for impacts on wildlife and trees.

Pre-construction drainage - Runoff across the site will be controlled by the use of a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. Reinstatement of any existing land drains once the pipeline construction has been completed forms part of land reinstatement.

Temporary access tracks - Temporary access tracks link the pipeline construction areas to the local road network. Where new or additional surfacing is required on any access tracks and compound areas, these are to be permeable surfaces where ground conditions allow. Where these temporary access tracks are across open ground, the topsoil will be stripped and the access track constructed by treating the subsoil with a soil binder or laying the track with stone on a geotextile membrane or timber bog mats.

Construction compounds - Approximately 52 temporary compounds are to be established along the route of the new pipeline for the storage of pipe, materials, plant and equipment. Each compound will be

[6] 6.3 Environmental Statement - Figures Chapter 1 Introduction. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-000177-6.3%20Figures%20Chapter%201%20Introduction.pdf

approximately 40 m x 60 m in area provide hard standing areas, with apron and access areas comprising stone laid on a geotextile membrane.

Topsoil removal and storage - Where topsoil stripping is required, the normal working practice is to strip full depth of topsoil (where present) from construction compounds and logistics hubs; access roads; across the working width; and any other areas to be trafficked. The depth of topsoil strip is not expected to exceed 0.3 m. Topsoils and subsoils intended for reinstatement will be temporarily stockpiled as close to where they are stripped from as practicable. The topsoil is to be reinstated above the subsoil.

Haul Road Construction - Haul roads will be required through most of the working area. Where soils are suitable, the haul roads will be formed from the exposed subsoil. Protection of the subsoil from compaction and smearing will be undertaken using appropriate techniques including treating the subsoil with a soil binder, laying the track with inert material on a geotextile membrane or installing timber bog mats.

Trench excavation and pipe installation - Open cut trenching is to be used for the majority of the pipeline route. The trench will be excavated, with temporary storage of subsoil on the opposite side of the working width to previously removed topsoil. Either selected backfill or imported granular pipe bedding material will then be placed into the excavation and, following pipe installation, suitable surround materials will be placed as required. The trench will be backfilled with the subsoil arisings and compacted. It is anticipated that between 90 m and 450 m of trenching activity will be undertaken each day. Trenchless installation using horizontal directional drilling may be undertaken in order to avoid obstructions or avoid sensitive areas.

Dewatering - In some locations, groundwater levels may be high and dewatering may be required to aid pipeline construction. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority.

Land reinstatement - Land drains will be reinstated to maintain the integrity of pre-existing land drainage patterns. The working width will then be cleared, any subsoil reinstated and loosened, and topsoil re-laid and seeded as required. Where possible, reinstatement of vegetation will generally be using the same or similar species to that removed (subject to restrictions for planting over and around the pipeline easements). Any affected hedgerow sections will be replanted, and any other affected boundaries reinstated as appropriate. Land will be returned to its original use with some exceptions such as change for ecological mitigation. Temporary fencing may remain in place until grazing land has sufficiently recovered to withstand grazing pressure.

In rural and other open areas, it is not anticipated that stripping or trenching will generate any large volume of excavated material that needs to be removed from site, with all excavated material expected to be replaced within the working area.

Construction is planned to commence following consent and be completed no later than 2023.

3 HRA Stage 1: Likely Significant Effects Test

Under regulation 63 of the Habitats Regulations the Secretary of State must consider whether a development is likely to have a likely significant effect (LSE), either alone or in combination with other plans or projects on any European site (Natura 2000 site). Where significant effects are likely and are not directly connected with or necessary to the management of that site, an AA is required of the implications of the plan or project for that site in view of its conservation objectives. The purpose of this section is to identify any LSEs on European sites and to record the Secretary of State's conclusions on the need for an AA and his reasons for including activities, sites or plans and projects for further consideration in the AA.

The Secretary of State has applied a coarse filter to identify LSEs in keeping with English Nature guidance[7]. He considers that any impact on a European site, from the Project alone or in-combination with other plans or projects, should be classified as an LSE unless impacts have been demonstrated to be trivial and inconsequential. All sites considered for LSE along with their qualifying features and the potential impact that could cause an LSE is provided in Table 1. All the impacts listed have the potential to arise from the Project alone and in-combination with other plans and projects.

In view of the evidence presented to him, the Secretary of State has identified six sites for which an LSE cannot be ruled out and therefore must be taken forward to an Appropriate Assessment. These sites are:

- Solent and Southampton Water SPA ,
- Solent and Southampton Water Ramsar,
- Thames Basin Heaths SPA,
- Solent and Dorset Coast pSPA,
- Thursley, Ash, Pirbright and Chobham SAC,
- Solent Maritime SAC.

[7] English Nature. 1999. Habitats Regulations Guidance Note No. 3. The Determination of Likely Significant Effect under the Conservation (Natural Habitats &c) Regulations 1994.

Table 1: European sites for which the potential for likely significant effects were considered, from the effects of the Project alone or in combination with plans or projects (summarised from the ExA's Report and the RIES).

European Site	Distance from the Project (km)	Features (and Seasons) Br – Breeding Wi – Over-wintering	Potential Impact	LSE	Reasoning
(p)SPAs and Ramsar					
Solent and Southampton Water SPA and Ramsar	1.85	• Common tern (Br), • Little tern (Br), • Roseate tern (Br), • Sandwich tern (Br), • Mediterranean gull (Br), • Black-tailed godwit (Wi), • Brent goose (dark bellied) (Wi), • Teal (Wi), • Ringed plover (Wi), • Waterbird Assemblage.	• Water quality, • Nutrient release.	Yes	Potential for a pollution pathway between proposed construction works and the sites.
Solent and Dorset Coast pSPA	1.85	• Common tern (Br), • Little tern (Br), • Sandwich tern (Br).	• Water quality, • Nutrient release.	Yes	Potential for a pollution pathway between proposed construction works and the site.
South West London Waterbodies SPA and Ramsar	0.65	• Gadwall (Wi), • Shoveler (Wi).	• Disturbance	No	No direct or in-direct impact on qualifying features of the sites.
Thames Basin Heaths SPA	0	• Dartford warbler (Br), • Nightjar (Br), • Woodlark (Br).	• Impacts on habitat, • Water contamination, • Noise and visual disturbance, • Increased recreational disturbance,	Yes	Direct habitat loss during construction and potential to cause adverse hydrological changes. Increased recreational activity.

European Site	Distance from the Project (km)	Features (and Seasons) Br – Breeding Wi – Over-wintering	Potential Impact	LSE	Reasoning
SACs					
Solent Maritime SAC	1.85	• Estuaries, • Spartina swards (*Spartinion maritimae*), • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*), • Sandbanks which are slightly covered by sea water all the time, • Mudflats and sandflats not covered by seawater at low tide, • Coastal lagoons* Priority feature, • Annual vegetation of drift lines, • Perennial vegetation of stony banks, • *Salicornia* and other annuals colonising mud and sand, • 'Shifting dunes along the shoreline with *Ammophila arenaria* ('white dunes')', • Desmoulin's whorl snail (*Vertigo moulinsiana*).	• Water quality, • Nutrient release.	Yes	Potential for a pollution pathway between proposed construction works and the site.
Thursley, Ash, Pirbright and Chobham SAC	0	• Northern Atlantic wet heaths with *Erica tetralix,* • European dry heaths, • Depressions on peat substrates of the *Rhynchosporion*.	• Physical disturbance – direct habitat loss, • Physical disturbance – substrate properties, • Hydrological changes.	Yes	Direct habitat loss

3.1.1 Solent and Southampton Water SPA and Ramsar, Solent and Dorset Coast pSPA and Solent Maritime SAC

The Secretary of State considers that an LSE for Solent and Southampton Water SPA and Ramsar, Solent and Dorset Coast pSPA and Solent Maritime SAC could arise from the potential for construction activities to cause the release of either contaminants or nutrients into watercourses or drainage ditches upstream of the sites. Such releases have direct connectivity with the sites and have the potential to adversely affect the qualifying features.

The Order Limits cross two small tributaries of the River Hamble: A Main River known as Ford Lake stream at SU 51575 14739 near Boorley Green approximately 2.2 km due northwest and upstream of the SPA; and, an unnamed Ordinary Watercourse at SU 53575 17990 in Wintershill, approximately 6 km NNE and upstream of the SPA.

The two watercourses that will be crossed by the Order Limits are relatively very small in comparison to the large freshwater and estuarine systems that comprise the designated sites and which support the qualifying features. Nevertheless, since a potential pathway exists between sources of contamination and the designated features there is potential for LSE.

In its Stage 1 HRA assessment [APP-130 and APP-131], the Applicant screened out an LSE from contamination and nutrient release on the basis that standard industry good practice measures would necessarily be applied and consequently were an embedded part of the Project. These measures would reduce both the likelihood and severity of any potential contamination of the European sites of the Solent such that there would be no LSE.

The ExA concluded that without the implementation of the mitigation measures committed to by the Applicant, a pollution pathway would exist between construction works and the European sites which could result in LSE. The Secretary of State concurs with the ExA and considers that the issue should be subject to AA.

3.1.2 Thames Basin Heath SPA

The Secretary of State considers that an LSE for the Thames Basin Heaths SPA could arise from construction activities. Impacts identified are:

- Direct loss of supporting habitat for Dartford warbler, nightjar and woodlark features of the SPA due to ground clearance and excavations.
- Potential for contamination releases from construction activities.
- Disturbance to qualifying species from changes in noise and visual stimuli within the SPA during construction.
- Disturbance to qualifying species from changes in noise and visual stimuli from increased recreational activity in the SPA due to displaced visitor numbers during construction works within Suitable Alternative Natural Greenspaces (SANGs).

Installation of the pipeline within the Order Limits will require excavations and clearance of vegetation within the SPA. This could lead to the physical loss of habitat used by the qualifying bird species.

Disturbance to breeding and non-breeding birds could arise during construction within the SPA and an increase in visitors displaced from SANGs could increase disturbance.

In its Stage 1 HRA assessment [APP-130 and APP-131] the Applicant screened out impacts from direct loss of supporting habitat on the grounds that the loss would be temporary and that the extent of impact would not be sufficient to cause an LSE.

This was questioned during the examination process, including having regard to the ruling of the Court of Justice of the European Union in the case of People Over Wind, Peter Sweetman v Coillte Teoranta (C-323/17). The case held that “it is not appropriate, at the screening stage, to take account of the measures intended to avoid or reduce the harmful effects of the plan or project on that site”. It is noted that this may or may not necessarily apply to mitigation measures that are not specifically for the

protection of the European site, such as standard industry good practice measures which may be deemed to form an embedded element of the Project.

The Secretary of State agrees with the ExA that, notwithstanding the possible relevance of the People Over Wind case, direct loss of supporting habitat would occur which could have an LSE and that this should be considered by AA.

The Applicant also screened out an LSE from releases of contamination. Consistent with his conclusion for LSE to the European sites of the Solent, the Secretary of State considers that in the absence of mitigation measures a pathway for impact exists and that this should be assessed through AA.

3.1.3 Thursley, Ash, Pirbright and Chobham SAC

An LSE for the Thursley, Ash, Pirbright and Chobham SAC could arise from potential construction activities. Impacts identified are:

- Potential for direct habitat loss.
- Changes in hydrology due to dewatering.
- Changes to the physical structure and chemistry of substrates.

Installation of the pipeline within the Order Limits will require excavations and clearance of vegetation within the SAC. Where Annex I habitats are present within the Order Limits, this could lead to the physical loss of qualifying habitats of the SAC.

The qualifying features Northern Atlantic wet heaths with *Erica tetralix* and Depressions on peat substrates of the *Rhynchosporion* are water-dependent and are sensitive to changes in the supply and quality of water. The project has the potential to affect groundwater flows to or within these habitats due to excavations and dewatering during construction and, during operation, due the presence of the pipeline as a preferential route for groundwater flow. The project will consequently have an LSE on these features.

Excavations for the project will disturb substrates, including for the excavation of the pipeline trench and for any topsoil stripping within the construction working area. This could have implications for, for example, the drainage and nutrient cycling of qualifying habitats of the SAC. The use of material not native to the SAC also has the potential to cause changes to chemistry of substrates within the SAC (e.g. pH). This could result in long term effects leading to degradation or loss of qualifying wetland habitats.

4 Appropriate Assessment

The purpose of this AA is to determine whether or not an adverse effect on the integrity of the features of the sites identified can be ruled out as a result of the Project, alone or in combination with other plans and projects, in view of the site's conservation objectives and using the best scientific evidence available.

Whereas the LSE screening process establishes that a link exists between a source of impact and the conservation features of interest, and that this would likely result in significant impact, the AA considers whether the scale of impact is such that the integrity of the site would be adversely affected. The AA also takes account of measures, secured as commitments through the DCO, that will either remove the pathway for impact or minimise the likelihood or extent of impact.

The AA for each site is provided separately in the following subsections.

5 Appropriate Assessment of European Sites within the Solent: Solent and Southampton Water SPA, Solent and Southampton Water Ramsar, Solent and Dorset Coast pSPA and the Solent Maritime SAC.

This AA considers the Solent and Southampton Water SPA, Solent and Southampton Water Ramsar, Solent and Dorset Coast pSPA and the Solent Maritime SAC together since they overlap geographically and share common qualifying features or provide supporting habitat for features.

The conservation objectives for the Solent and Southampton Water SPA and Solent and Dorset Coast pSPA are to:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Birds Directive, by maintaining or restoring:

- The extent and distribution of the habitats of the qualifying features;
- The structure and function of the habitats of the qualifying features;
- The supporting processes on which the habitats of the qualifying features rely;
- The population of each of the qualifying features; and
- The distribution of the qualifying features within the site.

The conservation objectives for the Solent and Maritime SAC are to ensure that the integrity of the site is maintained or restored as appropriate, and to ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species;
- The structure and function (including typical species) of qualifying natural habitats;
- The structure and function of the habitats of qualifying species;
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely;
- The populations of qualifying species; and
- The distribution of qualifying species within the site.

The qualifying features for the Solent and Southampton Water SPA and Ramsar, the Solent and Dorset Coast pSPA, and the Solent Maritime SAC for which a LSE was identified are presented in Table 1.

Within the Applicants HRA report [APP-130 and APP-131] and the RIES [PD-016] it was recognised that there is a direct pathway by which any contaminants released by construction activities could reach the European sites within the Solent. This could result in changes to the water quality within the European sites which in turn, could adversely impact the qualifying features of the Solent Maritime SAC and the habitat of the Solent and Water SPA and Ramsar and Solent and Dorset Coast pSPA qualifying features.

In particular, a pollution pathway would exist, in the absence of mitigation measures, between the construction works at Ford Lake and Boorley Green and the European sites of the Solent.

5.1 Water quality and pollution control

The Secretary of State has considered the evidence presented on the potential for nutrients and contaminants released during construction activities to impact on the water quality of the designated sites, consequently causing an adverse effect on the integrity of the sites.

The Applicant has committed to undertaking trenchless crossing of the Ford Lake Stream (TC001), as well as to a suite of measures for limiting the likelihood of construction activities causing pollution to enter any form of watercourse, including those draining to the Solent. These measures are set out in the Code of Construction Practice (CoCP) [REP7-028] and the Construction Environmental Management Plan (CEMP) [REP6-030] of which the latter document also includes a Water Management Plan (WMP).

Measures within the WMP, CEMP and CoCP cover flood risk, surface and foul water drainage as well as minimising the potential for soil run-off and for fuel and chemical spills. Commitments made within the above documents are secured through Requirement 5 and 6 of the DCO.

Furthermore, in the WMP [REP6-034] the Applicant commits to ensuring that 'The contractor would prepare method statements that set out how pollution and sediment risk would be managed during construction including pro-active actions and measures to control pollution risks. This could be either directly from the construction works or due to external factors such as extreme weather. Measures would include appropriate storage and handling of fuels and other substances hazardous to the environment in accordance with Commitment G8.' These method statements are to take account of advice set out in construction industry guidance for the minimisation of risks of contamination, including of the water environment.

Outline versions of these plans have been provided and, as a condition of Schedule 2 and Schedule 11 of the DCO, final versions will be agreed with relevant authorities prior to works commencing.

The Secretary of State considers that without the implementation of water management mitigation measures, significant adverse effects to the integrity of the Solent European sites could occur.

The Secretary of State is content with the application of measures specified within the outline WMP [REP6-034][8], outline CEMP [REP6-030][9] and outline CoCP [REP7-028][10], as secured through Requirements 5 and 6 of the Recommended DCO.

The Secretary of State agrees with the conclusions of the Applicant, NE and the ExA and he has concluded that Project alone and in-combination with other plans and projects will not have an AEoI of the Solent and Southampton Water SPA and Ramsar, the Solent and Dorset Coast pSPA, or the Solent Maritime SAC.

[8] Deadline 6 Submission - 8.51 Appendix B: Outline Water Management Plan (clean) - Revision No 2.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001100-8.51%20Appendix%20B%20Outline%20Water%20Management%20Plan.pdf

[9] Deadline 6 Submission - 8.51 - Outline Construction Environmental Management Plan (CEMP) - Revision No 2.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001363-8.51%20Outline%20Construction%20Environmental%20Management%20Plan%20(CEMP)%20(clean).pdf

[10] Deadline 7 Submission - 6.4 Appendix 16.1 Code of Construction Practice (clean) - Revision No. 5.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001485-6.4%20Appendix%2016.1%20Code%20of%20Construction%20Practice%20(clean).pdf

6 Appropriate Assessment of Thames Basin Heaths SPA

The qualifying features for the Thames Basin Heaths SPA for which an LSE was identified are presented in Table 1.

An LSE was identified for the Thames Basin Heath SPA in relation to:

- Direct loss of supporting habitat for Dartford warbler, nightjar and woodlark features of the SPA due to construction activities, such as vegetation clearance, excavation, etc;
- Degradation of supporting habitat for Dartford warbler, nightjar and woodlark features of the SPA due to adverse hydrological changes resulting from run-off of contamination from construction activities;
- Noise and visual disturbance of breeding qualifying species within the SPA; and
- Noise and visual disturbance of breeding qualifying species within the SPA due to displacement of recreational activities into the SPA from SANGs crossed by the Order Limits.

The Thames Basin Heaths SPA was designated in 2005 under Article 4.1 of the Birds Directive for supporting significant populations of the Annex I bird species Dartford warbler, nightjar and woodlark. Counts during the breeding season indicate that the SPA supports at least 27.8%, 7.8% and 9.9% of the breeding populations of Dartford warbler, nightjar and woodlark in Great Britain, respectively (JNCC, 2001[11]).

The SPA comprises a network of 13 separate heathland sites across Surrey, Hampshire and Berkshire which in aggregate cover an area of 8,274.72 ha (Natural England, 2016[12]). Each separate location has also been designated a SSSI under UK national legislation.

The Order Limits, of approximately 30 m in width, pass through three of these sites:

- Bourley and Long Valley SSSI for approximately 1.5 km;
- Colony Bog and Bagshot Heath SSSI for approximately 4 km; and
- Chobham Common SSSI for approximately 2.4 km.

The total area of the SPA within the Order Limits is 36.95 ha, which is 0.44% of the SPA.

In addition, the works will pass along the northern boundary of a fourth section of the SPA at Eelmoor Marsh SSSI.

The habitats within the SPA comprise dry and wet heathland. These habitats were at one time almost continuous but are now fragmented by less open habitats of scrub, woodland and managed conifer plantations. The SSSI components are surrounded by and include farmland, roads and other developments (JNCC, 2001[11]).

The main breeding habitats of Dartford warbler, nightjar and woodlark comprise open habitats of dwarf shrubs with scattered scrub and trees. Vegetation clearance will be required in advance of construction works (where these areas are vegetated) to facilitate the movement of construction plant etc. and to displace some wildlife species from the working area (e.g. reptiles and amphibians prior to commencement of works for the purpose of avoiding a breach of protected species legislation). The qualifying species of the SPA could potentially use any of the habitats affected by the works, either for breeding, roosting or foraging and could consequently be significantly affected by habitat loss.

6.1 Existing threats and pressures and current conservation status

The integrity of the SPA is under pressure from fragmentation, disturbance and the effects of urbanisation (e.g. encroachment, fly tipping, vandalism, uncontrolled fires and trampling). Encroachment of secondary

[11] JNCC, 2001 = JNCC, 2001 SPA description (information as published 2001) – Thames Basin Heaths SPA. [Online] Available at: http://jncc.defra.gov.uk/page-2050-theme=default

[12] Natural England, 2016. Supplementary Advice on Conserving and Restoring Site Features. Thames Basin Heaths Special Protection Area. Issue Version 2.

woodland and scrub on to open heathland is an ongoing process (Natural England, 2014[13]) and a lack of grazing or other management to control this encroachment would typically result in the loss of valuable heathland (qualifying bird breeding) habitat.

NE has highlighted disturbance as a significant issue for the SPA given its proximity to urban areas and pressures from new residential development. It is NE's position that significant impacts would result from new residential development within 5 km of the site's boundary (Thames Basin Heaths Joint Strategic Partnership Board, 2009[14]). Concerns relate to light and noise pollution from new housing estates, new roads and increased recreation by new residents, in particular dog walking. Increased predation by household pets can also be detrimental to ground nesting birds. Since 2006, NE has sought to counter impacts on the SPA's integrity from new residential development by making planning permission conditional on the provision, by developers, of alternative open space in the form of Suitable Alternative Natural Greenspace (SANGs).

The structure and function of habitats which support the qualifying species are also sensitive to changes in air quality (Natural England, 2016[15]).

6.2 Qualifying species potentially exposed to risk

6.2.1 Dartford warbler

The SPA supports the second largest concentration of Dartford warbler in Great Britain (JNCC, 2001[16]). Dartford warblers are found almost exclusively in lowland dry heathland with a mix of heather (*Calluna vulgaris*), trees and gorse (Ulex spp.) (Wotton *et al*., 2009[17]). Birds nest close to the ground (JNCC, 2004[18]) and require an abundance of shrub-layer invertebrates. Extensive unbroken dwarf shrub heath of mature heather interspersed with low to medium height gorse represents optimum breeding habitat. Undamaged, healthy gorse provides protection from harsh weather during winter, and from predators (Murison *et al*., 2007[19]).

Dartford warbler breeds between April and August inclusive and is most vulnerable to disturbance during this period. Murison *et al*. (2007[19]) reported that the species is particularly susceptible during the nest-building stage and within heather-dominated territories (as opposed to gorse that could offer greater protection). Disturbance causes reductions in breeding productivity and the number of successful broods and chicks fledged by breeding pairs (Murison *et al*., 2007[19]).

From 2010 to 2016, the SPA population was showing signs of recovery. However, in 2016 counts were lower than for 2015 (a reduction from 456 territories to 427). The declines could be accounted for by the difficulty in obtaining accurate counts when numbers are high, or increased mortality due to a series of severe frosts that occurred when food supplies were at their lowest (2Js Ecology, 2016[20]).

[13] Natural England, 2014 = Natural England, 2014. European Site Conservation Objectives for Solent and Southampton Water Special Protection Area. Site Code: UK9011061, s.l., s.n.
[14] Thames Basin Heaths Joint Strategic Partnership Board, 2009. Thames Basin Heaths SPA Delivery Framework, s.l.: Bracknell Forest Council.
[15] Natural England, 2016. Supplementary Advice on Conserving and Restoring Site Features. Thames Basin Heaths Special Protection Area. Issue Version 2.

[16] JNCC, 2001 = JNCC, 2001 SPA description (information as published 2001) – Thames Basin Heaths SPA. [Online] Available at: http://jncc.defra.gov.uk/page-2050-theme=default
[17] Wotton, S., Conway, G., Eaton, M., Henderson, I., Grice, P. 2009. The status of the Dartford Warbler in the UK and the Channel Islands in 2006. British Birds 102: 230–246.
[18] JNCC, 2004. Common Standards Monitoring guidance for Lowland heathland. ISSN 1743-8160
[19] Murison, G., Bullock, J.M., Underhill-Day, J., Langston, R., Brown, A.F. & Sutherland, W.J. 2007. Habitat type determines the effects of disturbance on the breeding productivity of the Dartford Warbler Sylvia undata. Ibis, 149(Suppl. 1): 16–26.
[20] 2Js Ecology, 2016 Thames Basin Heaths Special Protection Area Annex 1 bird survey results [Online] Available at: https://surreyheath.moderngov.co.uk/documents/s8821/2016%20Thames%20Basin%20Heaths%20Special%20Protection%20Area%20Annex%201%20bird%20surv ey%20results.pdf

6.2.2 Nightjar

The nightjar is a ground-breeding bird associated with dry heathland habitat. Known habitat preferences include open ground with low vegetation, bare patches and sparse woodland/scrub cover. Scattered trees are used for roosting. Nightjar utilise developing heathland within the SPA, including woodland areas subject to rotational clearance, storm damaged areas and areas alongside forest rides. Nightjar can forage several kilometres from their nesting territory (Natural England, 2016[21]).

Nightjar breed in the UK between May and September inclusive, nesting within gaps in deep heather on dry heath, often at the edge of woodland or heathland (JNCC, 2004[22]). Chicks are raised in secluded patches of bare ground within shrubby vegetation. Nightjar migrate in August or September, over-wintering in sub-Saharan Africa, and return to the UK in May (Natural England, 2016[21]).

Annual monitoring bird surveys undertaken by 2Js Ecology indicate that despite some annual fluctuations, nightjar has maintained its population within the SPA. Numbers were higher in 2016 (a territory count of 332) than in 2015, but lower than the peak number reported for 2014 (355) (2Js Ecology, 2016[20]). NE report a mean-count of 264 pairs for 1998-1999 (JNCC, 2001[23]).

The species is known to be sensitive to disturbance. There is increasing evidence that nightjar are vulnerable to disturbance, for example by dogs which flush the adult from the nest allowing predators to take the eggs or chicks. Significantly fewer chicks are raised to adulthood on sites with high levels of disturbance than on undisturbed sites (Ruddock and Whitfield, 2007[24]).

6.2.3 Woodlark

Woodlark is strongly associated with heathland habitat, nesting on the ground in shallow scrapes, often at the edge of woodland. Woodlarks require a mix of scrub/tree cover and sparsely vegetated land with bare ground and an abundance of invertebrates (Natural England, 2016[25]). Higher numbers of birds are associated with areas where vegetation has been manually cleared or burnt. Tussocky vegetation is required for nesting (Natural England, 2016[25]). Woodlark also forage on land adjacent to heathland, which can include grassland and fields outside the SPA boundary, as well as using open areas such as wide rides and breaks in plantations (Natural England, 2016[25]).

The core breeding season for woodlark is between February and June inclusive, but the birds are likely to be present within the SPA in lower numbers outside these months (Natural England, 2016[25]).

Of the three Annex I species within the SPA, only woodlark has continued to decline. In 2016, 117 territories were reported. This is the lowest count since surveys began in 2003 and represents a 49% decline from the peak number reported (229 in 2007) (2Js Ecology, 2016[26]). NE based the designation of the SPA on a report of 149 pairs provided by volunteer bird recorders for 1997.

Habitat availability is likely to be the principal factor limiting recovery of woodlark (Natural England, 2016[25]). Population density is also negatively affected by human disturbances at heathland sites, although impacts are partially offset by higher breeding productivity permitted by lower densities (Mallord *et al*. 2007[27]).

[21] Natural England, 2016. Supplementary Advice on Conserving and Restoring Site Features. Thames Basin Heaths Special Protection Area. Issue Version 2.

[22] JNCC, 2004. Common Standards Monitoring guidance for Lowland heathland. ISSN 1743-8160

[23] JNCC, 2001 = JNCC, 2001 SPA description (information as published 2001) – Thames Basin Heaths SPA. [Online] Available at: http://jncc.defra.gov.uk/page-2050-theme=default

[24] Ruddock, M & Whitfield, D.P. 2007. A review of disturbance distances in selected bird species. A report from Natural Research (Projects) Ltd to Scottish Natural Heritage.

[25] Natural England, 2016. Supplementary Advice on Conserving and Restoring Site Features. Thames Basin Heaths Special Protection Area. Issue Version 2.

[26] 2Js Ecology, 2016 Thames Basin Heaths Special Protection Area Annex 1 bird survey results [Online] Available at: https://surreyheath.moderngov.co.uk/documents/s8821/2016%20Thames%20Basin%20Heaths%20Special%20Protection%20Area%20Annex%201%20bird%20surv ey%20results.pdf

[27] Mallord, W.J., Brown, A., Dolman, P., Sutherland, W.J. 2007. Quantifying density dependence in a bird population using human disturbance. Oecologia. 153(1). 49- 56. doi: 10.1007/s00442-007-0716-0.

Woodlark is particularly vulnerable in winter and high rates of mortality have been associated with severe winter weather (Langston *et al*., 2007[28]).

6.3 Conservation Objectives

The Conservation Objectives of the SPA (Natural England, 2014[29]) require the maintenance or restoration of:

- the extent and distribution of the habitats of the qualifying features;
- the structure and function of the habitats of the qualifying features;
- the supporting processes on which the habitats of the qualifying features rely;
- the population of each of the qualifying features; and
- the distribution of the qualifying features within the site.

The Conservation Objectives are elucidated by 'Supplementary Advice' (Natural England, 2016[30]) that provides information to enable the achievement of the Conservation Objectives, including specific targets, provided in Table 2.

Table 2: Relevant Conservation Objectives for qualifying bird species of the Thames Basin Heaths SPA (Natural England, 2016[30])

Qualifying Feature	Conservation Objective
Dartford warbler	**Breeding population** – Maintain or restore the size of the breeding Dartford warbler population at or to a minimum of 445 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.
	Supporting habitat (both within and outside the SPA): predation – Reduce or restrict predation and disturbance caused by native and non-native predators.
	Supporting habitat (both within and outside the SPA): disturbance caused by human activity – Restrict or reduce the frequency, duration and/or intensity of disturbance affecting nesting, foraging or feeding birds so that the Dartford warbler feature is not significantly disturbed.
Nightjar	**Breeding population** – Maintain the size of the breeding nightjar population at or above 264 'churring' males, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.
	Supporting habitat (both within and outside the SPA): predation – Reduce or restrict predation and disturbance caused by native and non-native predators. Maintain or restore the safe passage of birds moving between nesting and feeding areas.
	Supporting habitat (both within and outside the SPA): disturbance caused by human activity – Restrict and reduce the frequency, duration and/or intensity of disturbance affecting nesting, roosting and/or foraging birds so that the nightjar feature is not significantly disturbed.

[28] Langston, R.H.W., Liley, D., Murison, G., Woodfield, E., Clarke, R.T. 2007. What effects do walkers and dogs have on the distribution and productivity of breeding Nightjar Caprimulgus europaeus. Ibis 149(Suppl. 1): 27–36.
[29] Natural England, 2014. European Site Conservation Objectives for Solent and Southampton Water Special Protection Area. Site Code: UK9011061, s.l., s.n.
[30] Natural England, 2016. Supplementary Advice on Conserving and Restoring Site Features. Thames Basin Heaths Special Protection Area. Issue Version 2.

Qualifying Feature	Conservation Objective
Woodlark	**Breeding population** – Maintain the size of the breeding woodlark population at a level which is at or above 149 breeding pairs, whilst avoiding deterioration from its current level as indicated by the latest mean peak count or equivalent.
	Supporting habitat (both within and outside the SPA): predation – Reduce or restrict predation and disturbance caused by native and non-native predators.
	Supporting habitat (both within and outside the SPA): disturbance caused by human activity – Restrict and reduce the frequency, duration and/or intensity of disturbance affecting nesting, foraging or feeding birds so that the woodlark feature is not significantly disturbed.

6.4 Supporting habitat within the vicinity of the Order Limits

The Applicant commissioned a detailed habitat survey of the Order Limits where they cross the SPA. The results of the survey are presented in the Applicant's HRA Report [APP130][31] and have provided an understanding of habitat with the potential to support the qualifying species of the SPA within, and adjacent to, the Order Limits.

Potential supporting habitat suitable for the qualifying species identified within the Order Limits comprises:

- grassland habitats (including acid grassland, amenity grassland and marshy grassland) 4.07 ha (11.01%);
- dry dwarf shrub heath – 7.6 ha (20.59%);
- wet heath – 1.67 ha (4.52%);
- dense scrub – 2.43 ha (6.58%); and
- woodland habitats (including broadleaved semi-natural and coniferous plantation woodland) – 15.88 ha (42.98%).

The above habitats could be used by one or more of the qualifying species of the SPA at any point in their life cycles e.g. nesting, territorial behaviours, foraging or roosting. With respect to woodland, scattered individual trees and the woodland edge could be utilised for roosting although larger blocks of continuous woodland are not likely to be used by the qualifying species.

Habitat potentially unsuitable for the qualifying species identified within the Order Limits comprises:

- hardstanding tracks - 2.86 ha (7.74%); and
- remaining unsuitable habitats e.g. standing water – 2.44 ha (6.6%).

6.5 Habitat occupancy within the vicinity of the Order Limits

Annual breeding bird surveys coordinated by 2Js Ecology on behalf of JNCC have provided an understanding of the historical distribution of breeding territories of the qualifying species of the SPA in relation to the Project pipeline route. Plans of breeding territories within 1 km of the Order Limits recorded between 2008 and 2018 are provided in Appendix C of the HRA Report [APP130 and APP131] [31,32].

The Applicant calculated five-year mean territory counts using 2Js Ecology data (2014 – 2018) for the area within 250 m of the Order Limits. They also reported these as percentages of the Conservation Objectives for territories for the SPA as a whole, as follows:

[31] 6.5 Environmental Statement - Habitats Regulations Assessment (1 of 2). Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-000250-6.5%20Habitats%20Regulations%20Assessment%20(1%20of%202).pdf
[32] 6.5 Environmental Statement - Habitats Regulations Assessment (2 of 2). Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-000251-6.5%20Habitats%20Regulations%20Assessment%20(2%20of%202).pdf

- Dartford warbler – 29.4 territories within 250m of the Order Limits (6.6% of the SPA Conservation Objective);
- Nightjar – 11.4 territories within 250m of the Order Limits (4.3% of the SPA Conservation Objective);
- Woodlark – 5.2 territories within 250m of the Order Limits (3.5% of the SPA Conservation Objective);

Territories were usually identified by the presence of territorial males, otherwise by the identification of a nest site. A 250 m buffer has been used as it represents the typical distance territorial birds range from their nest site.

The Applicant provided a detailed description of the presence of supporting habitats for the three qualifying species of the SPA along each section of the Project pipeline route that intersects the SPA. The description provided demonstrates that the route will pass through a variety of habitat types used by all three species and that the route intersects breeding territories of all three species.

6.6 Impacts from direct loss of supporting habitat

Construction works will directly impact a variety of supporting habitats of the three qualifying Annex I species of the SPA. If the full extent of the Order Limits within the SPA were impacted this would amount to 36.95 ha, which accounts for 0.44% of the SPA total area. Although, in reality, parts of the Order Limits comprise existing tracks and hardstanding.

6.6.1 Measures to mitigate impacts from direct loss of habitat

The Applicant has committed to using narrow working techniques within the SPA and to use trenchless crossing techniques in specific sections within the SPA[33,34]. These commitments are secured through the CoCP [REP7-028][35] and Requirements 5, 6 and 12 of the Recommended DCO.

The overall temporary habitat loss that will occur with these measures applied will amount to approximately 9 ha out of the total 8,275 ha which equates to 0.1% of the Thames Basin Heaths SPA.

6.6.2 Habitat regeneration

The Applicant has committed to using soil management techniques designed to facilitate the reinstatement of the habitat as found. Topsoils and subsoils intended for reinstatement will be temporarily stockpiled as close to where they were stripped as practicable (project commitment G155). Different soil types and made ground will be stripped and stored separately where applicable (G159). A methodology will be produced for stripping, handling, storage and replacement of all soils to reduce risks associated with soil degradation (G151). These project commitments are secured within the outline Construction Environmental Management Plan (CEMP), specifically Appendix F – Soil Management Plan (SMP) [REP6-042][36].

The Secretary of State has taken into consideration the dynamic and successional nature of heathland habitats. Vegetation clearance and turf stripping, similar in nature to that required with the construction phase of the Project, are often employed in heathland habitat management and restoration programmes (Symes and Day, 2003[37]). The heathland habitat is dynamic but is often in unfavourable condition if left

[33] Deadline 7 Submission - 8.89 Schedule of Habitats Regulations Assessment Commitments (clean) - Revision No. 2.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001447-8.89%20Schedule%20of%20Habitats%20Regulations%20Assessment%20Commitments%20(clean).pdf
[34] 6.5 Environmental Statement - Habitats Regulations Assessment (1 of 2). Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-000250-6.5%20Habitats%20Regulations%20Assessment%20(1%20of%202).pdf
[35] Deadline 7 Submission - 6.4 Appendix 16.1 Code of Construction Practice (clean) - Revision No. 5.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001485-6.4%20Appendix%2016.1%20Code%20of%20Construction%20Practice%20(clean).pdf
[36] Deadline 6 Submission - 8.51 Appendix F: Outline Soil Management Plan (clean) - Revision No 2.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001359-8.51%20Appendix%20F%20Outline%20Soil%20Management%20Plan%20(clean).pdf
[37] Symes, N., Day, J., 2003. A Practical Guide to the Restoration and Management of Lowland Heathland. Sandy: RSPB.

unmanaged due to its low structural diversity, lack of bare ground and, scarcity of the early stage of succession. The SSSI condition report for many of the component SSSI of the SPA (undertaken by NE in 2012 and 2013) states that many of the SSSI units are in unfavourable recovering status with management required to increase the proportion of early stages of heathland succession.

Following replacement of topsoils, the habitat will be allowed to regenerate naturally from the soil seedbank. A high degree of confidence that disturbed habitats could be reinstated to pioneer heathland or acid grassland in the short to medium term by these methods has been reported (Gimingham, 1992[38]).

Annual monitoring for five years will be implemented post-construction to amend management, as necessary to meet pre-defined habitat regeneration targets (Implementation of G47 in the outline Landscape and Ecological Management Plan [REP7-032][39].

The Secretary of State is satisfied that, with the construction working practices committed to and secured through DCO Requirement 6, any effect on habitat will be temporary only, with the habitat restored on completion of the pipeline installation.

6.6.3 Impact of temporary loss of supporting habitat

Works within the SPA will be limited to four months between 1 October to 31 January (inclusive), which is secured via Commitment G38 DCO Requirement 6. Vegetation clearance and construction will be restricted to this timeframe, which is outside of the sensitive breeding season. Breeding territories are established on an annual basis and at the time of proposed works, no breeding territories would have been established.

Annual monitoring data suggest a five-year average (2014-2018) of 46 territories, of all three qualifying bird species combined, are recorded per year within 250 m of the Order Limits. Territorial birds typically range up to approximately 250 m from their nest site locations during the breeding season, therefore a record of a territorial bird within 250 m of the Order Limits represents an instance whereby a bird territory could be intersected by the Order Limits, and as such, no complete disturbance of any one territory would result from implementation of the Project as the Order Limits are no more than approximately 30 m wide. Whilst some vegetation will inevitably require removal, breeding birds will still be able to establish and maintain territories and use them successfully for nesting and foraging throughout the habitat regeneration period. Areas of habitat affected by the works will be especially productive for foraging and will continue to offer nesting opportunities for the ground- nesting bird species.

Post works, during habitat regeneration, the land disturbed by the project will not be unsuitable for the qualifying species. Bare ground does not preclude the breeding of qualifying bird species with both nightjar (Berry, 1976[40]) and woodlark (Sitters *et al*., 1996[41]) recorded breeding on bare earth. Bare earth also increases the abundance of invertebrates, the prey species of all three qualifying bird species.

The Secretary of State has had regard to the commitment for vegetation removal and excavation works within the SPA to be undertaken outside of the breeding season of the qualifying species, and that since breeding territories are re-established annually, the works will not impact the function of pre-established territories.

Therefore, the Secretary of State concludes that the impacts of direct habitat loss will not result in an AEoI of the Thames Basin Heaths SPA.

6.7 Impacts to the SPA due to adverse hydrological changes

[38] Gimingham, C. H. 1992. The Lowland Heathland management handbook (ENSO8)
[39] Deadline 7 Submission - 8.50 Outline Landscape and Ecological Management Plan (LEMP) (Clean) - Revision No. 3.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001490-8.50%20Outline%20Landscape%20and%20Ecological%20Management%20Plan%20(LEMP)%20(clean).pdf
[40] Berry, R., 1976. Nightjar habitats and breeding in East Anglia. British Birds, 72(5), pp. 207-218.
[41] Sitters, H. P., Fuller, R.J.,Hoblyn, R.A., Wright, M.T., Cowie, N., Bowden, C.G.R. 1996. The Woodlark *Lullula arborea* in Britain: population trends, distribution and habitat occupancy. *Bird Study*, 32(2), pp. 172-187

The ExA highlighted a LSE due to the potential pathway for contamination from construction works to impact on the supporting habitats of the qualifying species of the Thames Basin Heaths SPA, although no further assessment was described in the ExA's report. The Secretary of State agrees with the ExA that avoidance and reduction measures are required to address potential adverse hydrological changes to the Thames Basin Heaths SPA.

The Secretary of State is content that such measures have been identified, as discussed in Section 5 for the European sites of the Solent, and that, with the implementation of the outline CEMP [REP6-030][44] and outline WMP[42], secured though Requirement 6 of the Recommended DCO, pollution/contamination events occurring during construction are unlikely to arise. Therefore, the Secretary of State concludes that the impacts of hydrological changes will not result in an AEoI of the Thames Basin Heaths SPA.

6.8 Impact from noise and visual disturbance of breeding qualifying species due to construction activities within the SPA

During periods of construction, there could be an increase in local noise levels and human activity within and near to the Order Limits. This could potentially cause disturbance to the site's qualifying species by affecting the supporting habitat, breeding population levels and the distribution of the qualifying species. This could potentially adversely affect site integrity as defined by the Conservation Objectives for the site. Sources of noise include movement of plant and personnel within the construction area, excavation and other groundworks, and transport.

The qualifying species may avoid the zone of influence surrounding the Order Limits during construction. Such displacement during the breeding season could disrupt normal behavioural patterns such as breeding, feeding and roosting, and potentially affect the short term viability of the populations (Natural England, 2016[43]).

Mitigation in the form of Commitment G38 requires works within the Thames Basin Heaths SPA to occur between 1 October and 31 January (e.g. outside the Dartford warbler, nightjar and woodlark breeding season) unless otherwise agreed by NE. This measure is secured through the outline CEMP [REP6-030][44], the Schedule of HRA Commitments[45] and Recommended DCO Requirement 6 and is, in the view of the Secretary of State sufficient to avoid an AEoI of the Thames Basin Heaths SPA from noise and visual disturbance.

6.9 Noise and visual disturbance of breeding qualifying species within the SPA due to displacement of recreational activities into the SPA from SANGs crossed by the Order Limits

Designation of Suitable Alternative Natural Greenspace (SANG) has been identified as a mechanism for increasing awareness of other recreational areas available to the rising population of the region, and of maintaining or improving the quality of these identified areas for recreation, thereby serving to counter an increase in activity within the SPA..

The Order Limits pass through the following four allocated SANGs and one proposed SANG:

- Crookham Park (Queen Elizabeth Barracks) SANG (SU 81596 51584);
- Southwood Golf Course proposed SANG (SU 84727 54817);
- St Catherine's Road SANG (SU 89025 58134);

[42] Deadline 6 Submission - 8.51 Appendix B: Outline Water Management Plan (clean) - Revision No 2.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001351-8.51%20Appendix%20B%20Outline%20Water%20Management%20Plan%20(clean).pdf

[43] Natural England, 2016. Supplementary Advice on Conserving and Restoring Site Features. Thames Basin Heaths Special Protection Area. Issue Version 2.

[44] Deadline 6 Submission - 8.51 Outline Construction Environment Management Plan (CEMP) (clean) - Revision No 2.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001363-8.51%20Outline%20Construction%20Environmental%20Management%20Plan%20(CEMP)%20(clean).pdf

[45] Deadline 7 Submission - 8.89 Schedule of Habitats Regulations Assessment Commitments (clean) - Revision No. 2.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001447-8.89%20Schedule%20of%20Habitats%20Regulations%20Assessment%20Commitments%20(clean).pdf

- Windlemere SANG (SU 94264 61763); and
- Chertsey Meads SANG (TQ 06159 66151).

Construction activity within a SANG could result in a temporary loss of amenity to these sites, with visitors potentially deterred by noise, visual change, or restricted access. Reduced attraction of the SANG as a place or recreation may draw potential or established visitors to consider alternative locations, which may include parts of the SPA. Impacts to the qualifying features from increased disturbance would only be significant during the breeding season, from 1 February to 30 September. However, no seasonal constraints on timing of construction works in SANGs has been proposed by the Applicant, and it can be assumed that much of the construction in SANGs may occur in the breeding season. Furthermore, construction activity will likely take place at multiple 'work fronts' and could theoretically affect all SANGs simultaneously or consecutively.

Other green spaces, while not designated as SANGs, exist within the region that provide recreational amenity, which may absorb part of the displaced visitor numbers. Such spaces are not new and already have visitors, but visitors to SANGs considering alternative locations for recreation during the period of Project construction works may look to utilise these spaces as well as to parts of the SPA. If a visitor is put off using a SANG, their choice of alternative venue may partly be determined by its relative proximity to the SANG and ease of access as well as the quality and type of amenity that the space provides for.

The Applicant has provided information on each affected SANG, its distance from the nearest part of the SPA, other potential amenity areas in the vicinity of the SANG and their distances relative to that of the SPA.

The Applicant has not been able to gauge the extent of displacement that construction works would cause at each SANG in isolation or in aggregate. Nor has the Applicant been able to make a direct quantitative link between the extent of displacement from a SANG and the resulting increase in visitor numbers within the SPA, or with the additional level of disturbance this would cause for qualifying features of the SPA.

6.9.1 Measures to minimise displacement

The Applicant has committed to a number of measures aimed at reducing the impact of the construction works on visitors to SANGs such that visitors continue to use them. The measures committed to by the Applicant include:

- that no SANG will be closed;
- construction within SANGs will be limited to a maximum of two years;
- SANG circular walks will be maintained;
- pedestrian and vehicle access to the SANGs will be maintained; and
- fencing around compounds within SANGs will be agreed with the relevant authority.

Further mitigation has been proposed by NE[46], such as:

- providing user-friendly information at accesses points in advance of works;
- providing information while works are taking place to make it clear people are still welcome;
- having people on site who can interact with visitors;
- maintaining a screen of vegetation alongside access routes to decrease the visibility of works; and
- minimising land take within the SANGs.

[46] Deadline 4 Submission - Response to the Examining Authority's written questions and requests for information (ExQ2) issued on Monday 13 January 2020. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001065-Natural%20England%20Esso%20SLP%20-%20Examiners%20Questions%20NE%20130120.pdf

The Applicant identified two SANGs, Southwood Country Park SANG[47] and St Catherine's Road SANG[48], that are particularly close to access points of the SPA and for which there is consequently an increased likelihood that displacement would be to the SPA. Site Specific Plans (SSP) have been provided for these two SANGs which include additional commitments. The Southwood Country Park SANG SSP includes further measures to reduce impact to the SANG such as: reducing working within the SANG to 45 weeks within the two year period; removal of tree and scrub will occur during the winter months; open cut works will be done in the Autumn months; and the screening of the construction compound will be agreed with Rushmoor BC. The St Catherine's Road SANG SSP includes the following additional mitigation: the vehicles and machinery used will be smaller than normal open cut vehicles and machinery; fabrication work will be done behind a closed screen; screening fences will be approved by Surrey Heath BC; screening materials will be chosen to reduce visual impact; and information signs will be provided to inform the users of the works and availability of alternative nearby green space.

The Secretary of State is content that the CoCP [REP7-028][49] ensures the construction work within the SANGs will range from approximately 12 to 56 weeks within the two year period. Therefore, impacts to the SANGs will not be continuous over the two year construction timescale. With the application of the above measures, the Secretary of State is satisfied that there will be limited displacement of SANG users to the Thames Basin Heath SPA and that there would be little if any impact on qualifying species of the SPA caused by noise and disturbance from displaced visitors. The measures are, in the view of the Secretary of State, sufficient to avoid an AEoI of the Thames Basin Heaths SPA.

6.10 Conclusion

NE agreed that there would be no AEoI alone or in-combination on the Thames Basin Heaths SPA; the ExA agrees with this conclusion.

The Secretary of State is satisfied that with the secured mitigation highlighted in the sections above that the Project will not lead to permanent loss of any supporting habitat for the qualifying Annex I bird species of the Thames Basin Heath SPA and that during the period of habitat regeneration, following completion of the Project construction works, the qualifying species will be able to utilise the regenerating habitat.

The Secretary of State is content that with the secured mitigation highlighted above there will be no noise or visual disturbance to qualifying breeding species during their breeding seasons from construction activities and that little, if any increase in impact will result from displaced SANG users.

Furthermore, the Secretary of State is satisfied with the measures secured for management of water and for the control of contamination during construction and that the residual risk of impact to supporting habitats of the qualifying features due to contamination is low.

The Secretary of State is satisfied that the above assessment is appropriate. He agrees with the Applicant, NE and the ExA and concludes that the Project alone and in-combination with other plans and projects will not have an AEoI of the Thames Basin Heaths SPA.

[47] Deadline 6 Submission - 8.60 Site Specific Plan - Southwood Country Park (clean) - Revision No 2.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001376-8.60%20Site%20Specific%20Plan%20-%20Southwood%20Country%20Park%20(clean).pdf

[48] Deadline 6 Submission - 8.61 Site Specific Plan - St Catherine's SANG (clean) - Revision No 2.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001378-8.61%20Site%20Specific%20Plan%20-%20St%20Catherine%27s%20SANG%20(clean).pdf

[49] Deadline 7 Submission - 6.4 Appendix 16.1 Code of Construction Practice (tracked change) - Revision No. 5.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001486-6.4%20Appendix%2016.1%20Code%20of%20Construction%20Practice%20(tracked%20change).pdf

7 Appropriate Assessment of Thursley, Ash, Pirbright and Chobham SAC

The Thursley, Ash, Pirbright and Chobham SAC is an extensive complex of heaths. The SAC comprises a composite of several large fragments of heathland, with a total area of 5,154.5 ha (JNCC, 2015[50]), situated amidst farmland, woodland and villages in the counties of Surrey, Hampshire and Berkshire. Throughout the SAC, wet heath and valley mires transition to dry heath, scrub, woodland and acid grassland. The heathlands support an important fauna, including birds, reptiles and invertebrates, as well as a range of vascular plant and bryophyte species.

The SAC has been designated for representing some of the best areas in the UK of the following habitats listed under Annex I of the Habitats Directive:

- H4030 European dry heaths;
- H4010 Northern Atlantic wet heaths with *Erica tetralix*; and
- H7150 Depressions on peat substrates of the *Rhynchosporion*.

The Secretary of State has considered the potential effects on the Thursley, Ash, Pirbright and Chobham SAC, with respect to all three qualifying Annex I habitats, from the reduction in the extent of qualifying habitat (i.e. habitat loss) and from adverse changes to processes supporting qualifying habitats via the following three LSEs:

- Physical ground disturbance to lay the pipeline, from vegetation clearance, construction of site compounds, damage by vehicles and plant and trampling by operatives;
- Changes in hydrology, due to dewatering during pipeline construction and the presence of the pipeline during operation; and
- Changes to the physical structure and chemistry of substrates due to excavations and compaction from vehicles and plant during construction.

The areas of the SAC within the zone of influence of the Project also form part of the Thames Basin Heath SPA and have been designated as the following SSSI under National legislation:

- Colony Bog and Bagshot Heath SSSI; and
- Chobham Common SSSI.

7.1 Summary descriptions of the qualifying habitats

7.1.1 European dry heath

European dry heaths typically occur on freely-draining, acidic to circumneutral soils with generally low nutrient content. Ericaceous dwarf-shrubs dominate the vegetation. The most common is heather (*Calluna vulgaris)*, which often occurs in combination with gorse (*Ulex* spp.), bilberry (*Vaccinium* spp.) or bell heather (*Erica cinereal)*, though other dwarf-shrubs are important locally. Nearly all dry heath is semi-natural, being derived from woodland through a long history of grazing and burning. Most dry heaths are managed as extensive grazing for livestock or, in upland areas, as grouse moors. Regional variation within among dry heaths occur throughout the UK, encompassing 12 NVC types.

The SAC site contains a series of large fragments of once-continuous heathland. It is selected as a key representative of NVC type H2 *Calluna vulgaris – Ulex minor* dry heathland. This heath type has a marked south-eastern and southern distribution. There are transitions to wet heath and valley mire, scrub, woodland and acid grassland, including types rich in annual plants. The European dry heaths support an important assemblage of animal species, including numerous rare and local invertebrate species, European nightjar (*Caprimulgus europaeus*), Dartford warbler (*Sylvia undata*), sand lizard (*Lacerta agilis)* and smooth snake (*Coronella austriaca*).

[50] JNCC, 2015. Natura 2000 - Standard Data Form. Solent Maritime Special Area of Conservation, s.l., s.n.

European dry heath habitat (H4030) occurs widely across the SAC, often as part of a complex mosaic of habitats across an estimated area of 1,830 ha.

7.1.2 Northern Atlantic wet heaths with Erica tetralix

This habitat is a dwarf shrub habitat present where the water table is naturally high, above or at ground level for at least some of the year. Wet heath is typically found on acidic, nutrient-poor substrates, such as shallow peats (<0.5m) or sandy soils (Hampton, 2008[51]). The habitat supports vegetation that reflects the geographical location of the site, altitude, aspect and soil conditions. Typically, the vegetation features cross-leaved heath (*Erica tetralix*), heather and purple moor-grass (*Molinia caerulea*).

The Northern Atlantic wet heaths with *Erica tetralix* feature within the SAC is represented by the National Vegetation Classification (NVC) plant community M16 *Erica tetralix-Sphagnum compactum* wet heath and has an estimated extent of approximately 321 ha within the SAC. The habitat is part of a complex mosaic of habitats within the site (Natural England, 2016[52]).

The wet heath within the SAC is characteristic of drier climates in the southeast of Britain. The bog-moss *Sphagnum compactum* is typically abundant, and mixtures of cross-leaved heath, heather and purple moor-grass are dominant. Species with primarily southern distributions tend to be present, such as meadow thistle (*Cirsium dissectum*) and the scarce brown beak-sedge (*Rhynchospora fusca*) and marsh gentian (*Gentiana pneumonanthe*) (JNCC, 2006). Key structural, influential and site-distinctive species include higher plants such as those described above and assemblages of mosses and lichens (Natural England, 2016[52]).

7.1.3 Depressions on peat substrates of the *Rhynchosporion*

This habitat is found as small stands within habitat mosaics associated with wet heath and valley mire. The total extent of the feature within the SAC is estimated at approximately 35.3 ha.

The habitat occurs in natural bog pools of patterned valley mire, in disturbed peat of trackways, in stripped areas of bogs and in former peat-cuttings, formed on humid, exposed peat or sometimes sand. Plant communities comprising this habitat are characterised by oblong-leaved sundew (*Drosera intermedia*), round-leaved sundew (*D. rotundifolia*), marsh club moss (*Lycopodiella inundata*) and white beak- sedge (*Rhynchospora alba*).

Supplementary advice for the SAC advises that the Depressions on peat substrates of the *Rhynchosporion* feature is characterised by the following NVC plant communities:

- M1 *Sphagnum auriculatum* bog pool;
- M2 *Sphagnum cuspidatum/recurvum* bog pool;
- M6 *Carex echinata-Sphagnum recurvum/auriculatum* mire;
- M14 *Schoenus nigricans-Narthecium ossifragum* mire; and
- M21 *Narthecium ossifragum-Sphagnum papillosum* mire.

In line with this advice, stands of these plant communities have been classed as component vegetation communities of the Depressions on peat substrates of the *Rhynchosporion* feature.

The above plant communities are characteristic of the valley mires of the SAC. The Depressions on peat substrates of the *Rhynchosporion* habitat is also found in mechanically or hydrologically disturbed areas of wet heath, such as tracks or the edges of water bodies, comprising the plant community M16c *Erica tetralix-Sphagnum compactum* wet heath, *Rhynchospora alba* sub-community.

[51] Hampton M., 2008. Management of Natura 2000 habitats. 4010 Northern Atlantic wet heaths with Erica tetralix. European Commission.
[52] Natural England, 2016. Supplementary Advice on Conserving and Restoring Site Features. Thames Basin Heaths Special Protection Area. Issue Version 2.

7.2 Conservation Objectives

The Conservation Objectives provide the necessary parameters to define the favourable conservation status of the Annex I habitats for which the site has been designated (Natural England, 2014[53]). Favourable Conservation Status is achieved by maintaining or restoring:

- the extent and distribution of qualifying natural habitats;
- the structure and function (including typical species) of qualifying natural habitats; and
- the supporting processes on which qualifying natural habitats rely.

Supplementary advice to the Conservation Objectives (Natural England, 2016[54]) describes in more detail the range of ecological attributes on which the qualifying habitats depend, and which are most likely to contribute to a site's overall integrity. It sets out minimum targets for each qualifying feature to achieve to meet the site's objectives.

7.3 Qualifying habitats identified within the Order Limits

The Order Limits cross the Thurley, Ash, Pirbright and Chobham SAC for two stretches.

Between Ordnance Survey grid references SU 99014 64629 and SU 96914 63552 the Order Limits cross the area of the SAC also designated as the Chobham Common SSSI. This crossing is approximately 2.4 km in length, over which the Order Limits cover an area of approximately 14.05 ha of the SAC.

Between Ordnance Survey grid references SU 90941 58809, SU 90896 60650 and SU 93765 61655 the Order Limits cross the area of the SAC also designated as the Colony Bog and Bagshot Heath SSSI. This crossing is approximately 4 km, over which the Order Limits cover an area of approximately 14.50 ha.

Detailed habitat, vegetation and botanical survey of both SSSI components of the SAC was undertaken in summer 2018. The survey results determined the extent of qualifying habitats in relation to the Order Limits. The Secretary of State notes that the Applicant has used the survey results to inform route design, proposed construction techniques and requirements for good practice measures.

7.3.1 Chobham Common

Between Ordnance Survey grid references SU 99014 64629 and SU 96914 63552, the route is focused along a well-established track. The surveyed area of this part of the SAC, within Chobham Common, was found to be dominated by large stands of European dry heaths qualifying habitat.

Northern Atlantic wet heaths with *Erica tetralix* qualifying habitat was found to occur in a series of three valleys along the existing track. The track crosses these valleys on raised embankments, with ponds formed on the upstream (northwestern) sides. Very small stands of the Depressions on peat substrates of the *Rhynchosporion* qualifying habitat was found to occur in disturbed areas and seasonally flooded edges of ponds.

Three trenchless crossings (TC024, TC025 and TC026) are proposed to cross areas of wetland along this part of the pipeline route.

7.3.2 Colony Bog and Bagshot Heath

Between Ordnance Survey grid references SU 90941 58809, SU 90896 60650 and SU 93765 61655 the route crosses areas that include European dry heaths, Northern Atlantic wet heaths with *Erica tetralix* and Depressions on peat substrates of the *Rhynchosporion*, with the latter two habitat types occurring at Folly Bog, an area of low local topography. Route selection has mostly enabled the avoidance of these habitats from within the Order Limits, which are instead mainly restricted to areas of semi-natural woodland with small areas of acid and neutral grasslands, scots pine conifer plantation. The Order Limits

[53] Natural England, 2014. European Site Conservation Objectives for Solent and Southampton Water Special Protection Area. Site Code: UK9011061, s.l., s.n.

[54] Natural England, 2016. Supplementary Advice on Conserving and Restoring Site Features. Thames Basin Heaths Special Protection Area. Issue Version 2.

avoid the wetland habitats of Folly Bog with the exception of a strip of Northern Atlantic wet heaths with *Erica tetralix*, approximately 75m long.

7.4 Impacts from direct physical disturbance on qualifying habitats

Project construction activities could result in direct physical disturbance to qualifying habitats of the SAC within the Order Limits leading to a reduction of qualifying habitat extent, potentially adversely affecting site integrity.

Assuming a worst-case where all qualifying habitat within the Order Limits were lost, this will amount to the following:

- European dry heaths: 7.61 ha (0.42% of this habitat within the SAC)
- Northern Atlantic wet heaths with *Erica tetralix*: 1.13 ha (0.35% of this habitat within the SAC)
- Depressions on peat substrates of the *Rhynchosporion*: 0.12 ha (0.34% of this habitat within the SAC)

However, construction works within the Order Limits will not require the physical disturbance of the whole of this area. Working within ecologically designated sites will be controlled using a variety of methods. These will take account of the reasons for designation to identify the appropriate techniques to reduce impacts. This could include limiting the number of compounds, reducing corridor widths and using lighter vehicles within the sites (G48). Where works in wet heath are unavoidable, effects on soils and surface vegetation will be reduced through the use of ground protection matting and use of appropriate machinery where practicable (G51).

Between Ordnance Survey grid references SU 99014 64629 and SU 96914 63552, within Chobham Common, trenchless construction methods will be used to construct the route beneath the three valleys supporting Northern Atlantic wet heaths with *Erica tetralix* and Depressions on peat substrates of the *Rhynchosporion* qualifying habitats. There will therefore be no effects of habitat loss associated with pipeline installation at these locations. Above-ground construction activities in areas supporting these habitats will comprise vehicle and personnel movements and pipe storage.

Between Ordnance Survey grid references SU 90941 58809, SU 90896 60650 and SU 93765 61655, within Colony Bog and Bagshot Heath (SSSI), the Order Limits have been designed to reduce the area of qualifying habitats potentially affected by physical disturbance. The Order Limits include a total area of approximately 0.04 ha of Northern Atlantic wet heaths with *Erica tetralix* habitat, equivalent to 0.1% of the total extent of this feature within the SAC, and no area of Depressions on peat substrates of the *Rhynchosporion* habitat. Areas of qualifying habitat in the Order Limits will not be affected by excavations as the Limits of Deviation (i.e. the area within which the pipeline would be positioned) do not encompass any of this habitat. Sensitive habitat outside the Limits of Deviation but within the Order Limits will be protected from damage from ancillary activities (e.g. plant movements) by a commitment that provides that where sensitive features are to be retained within or immediately adjacent to the Order Limits, an appropriate buffer zone will be created where this extends within the Order Limits. The buffers will be established using appropriate fencing and signage. Suitable methodologies will be produced to ensure that construction works are undertaken in a manner that reduces the risk of damage or disturbance to the sensitive feature (G40). With the application of the measures committed to, the Applicant identified that a total of 1.8 ha or 0.1% of European dry heath would be impacted within the SAC.

As a result of these avoidance and good practice measures, there will be no permanent (irreversible) direct loss of habitat as any land-take as part of construction will be temporary. Once construction is complete, heathland will be reinstated using natural regeneration unless otherwise agreed with NE (HRA1).

7.4.1 Conclusions on the impact of direct loss on the SAC

The Secretary of State has had regard to all the submitted information throughout the Examination and acknowledges that, with the application of mitigation measures identified above, a relatively small percentage of European dry heaths habitat that will be lost (estimated to be 0.1% of its extent within the

SAC) and that, with the application of measures to ensure natural regeneration of the habitat (HRA1), the loss of habitat will be temporary.

The Secretary of State is satisfied that direct impacts to Northern Atlantic wet heaths and Depressions on peat substrates of the *Rhyncosporion* qualifying habitats will be avoided through use of trenchless construction techniques and the application of good practice measures included in the LEMP [REP7-032].

As such, the Secretary of State shares the view of NE[55] that, with the implementation of the mitigation measures identified above, and secured though Requirements 5, 6 and 12 of the Recommended DCO, the loss of the qualifying habitats due to direct physical disturbance will be temporary and will be of a small scale that will not result in AEoI of the Thursley, Ash, Pirbright and Chobham SAC.

7.5 Assessment of impacts to the SAC due to adverse hydrological changes

7.5.1 Pathway to effects by changes to hydrology

The Conservation Objectives of the SAC identify the potential for changes to hydrology to adversely affect the integrity of the SAC by reducing the extent of, and altering natural processes supporting, Northern Atlantic wet heaths with *Erica tetralix* and Depressions on peat substrates of the *Rhynchosporion* qualifying habitats. Two Project activities have the potential to alter flows or levels of surface water and groundwater supporting the two relevant qualifying habitats of the SAC. These are dewatering during construction and the physical presence of the pipeline during operation.

Dewatering may be required to remove groundwater accumulated in excavations, with resultant waste water discharged to an appropriate location on site, typically a surface water body or drainage ditch. Once installed, there is potential for the pipeline to interfere with the local hydrological regime, for example by redirecting groundwater flows away from groundwater dependent habitats.

To help inform his assessment, the Secretary of State has had regard for conceptual site models (CSM) developed by the Applicant[56].

7.5.2 Conceptual Site Models

The Applicant identified groundwater dependent habitats within the SAC with potential for impact from the Project. For these habitats, CSM were developed to describe conceptually their hydro-ecological functioning, including:

- dependence on groundwater levels, flows and chemistry compared with other sources;
- supporting regime of levels, flows and chemistry; and
- supporting substrate properties.

The CSMs were based on reviews of topographical, hydrological and hydrogeological information, publicly available or obtained as part of the Project. The investigation also drew upon published scientific research into the hydro-ecology of the habitats.

Three CSMs were developed, breaking the parts of the SAC traversed by the Order Limits as follows:

- Habitats within the area of the SAC designated as Chobham Common SSSI.
- Habitats in the vicinity of Folly Bog;
- Habitats excluding Folly Bog within the area of the SAC designated as Colony Bog and Bagshot Heath SSSI.

[55] Deadline 4 Submission - Response to the Examining Authority's written questions and requests for information (ExQ2) issued on Monday 13 January 2020. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001065-Natural%20England%20Esso%20SLP%20-%20Examiners%20Questions%20NE%20130120.pdf

[56] 6.5 Environmental Statement - Habitats Regulations Assessment (1 of 2). Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-000250-6.5%20Habitats%20Regulations%20Assessment%20(1%20of%202).pdf

7.5.2.1 Chobham Common

The geological and hydrogeological information for the Chobham Common (SSSI) sector of the SAC shows that groundwater contributes to sustaining the wetland habitats identified by the botanical survey. It was found that a large proportion of the site falls within an area susceptible to groundwater flooding and that these areas correlate with topographical contours outlining localised low and/or flat topographical areas. The existing track running southwest to northeast forms a local barrier to surface and sub-surface flow, occasioning ponding zones immediately north of the track during wet periods. Artificial ponds appear to have been created to enhance vegetation in parts of the site that are likely not sustained by groundwater.

Habitat of high to moderate-to-low groundwater dependency was recorded in the central to west-central part of the Order Limits, and in a portion of the north-eastern part of the Order Limits.

7.5.2.2 Folly Bog

The review of available geological and hydrogeological information confirms a significant degree of groundwater contribution to sustaining the valley mire habitat within Folly Bog. A review of site-specific information, including the results of hand coring surveys, confirmed that groundwater is a major control on the vegetation.

Habitats within Folly Bog were assessed as having a high groundwater dependency, while Wet dwarf shrub habitats located on the periphery of Folly Bog have been assessed as having less dependence on groundwater.

The CSM for the site found that areas susceptible to groundwater flooding correlate with contours and the localised low topographical area within Folly Bog. Habitats with potential for groundwater dependency in the topographical low, correlate with the area where the ground level intercepts the regional groundwater table.

A large proportion of the Order Limits near Folly Bog pass through an area with limited potential for groundwater flooding to occur. Habitat survey showed that within the Order Limits, dry dwarf shrub heath is the dominant habitat. This habitat is not groundwater dependent. However, at its eastern end, where the ground within the Order Limits is at a similar elevation to Folly Bog, the habitat changes to wet heath. This habitat likely has a high to low groundwater dependency. This eastern end of the valley mire is an area where there is potential for groundwater flooding to occur at the surface.

7.5.2.3 Colony Bog and Bagshot Heath (SSSI) – excluding Folly Bog

Away from Folly Bog, the area supports habitat with low or no groundwater dependency. With a thick unsaturated zone identified beneath this part of the site, there is not expected to be any groundwater dependency. The CSM developed for this area identified that the pipeline trench will be located above the water table.

7.5.3 Measures to avoid or reduce impacts from hydrological changes

7.5.3.1 Chobham Common

Construction

Within the section of the SAC that is also designated as the Chobham Common SSSI, trenchless pipeline installation methods are proposed in the central and north eastern parts of the Order Limits (TC024, TC025 and TC026). No open cut trenching is proposed in the areas supporting Northern Atlantic wet heaths with *Erica tetralix* and Depressions on peat substrates of the *Rhynchosporion* habitats. Except at the launch and reception end of the trenchless crossing where shallow excavations equivalent to the depth of a trench will be required, the trenchless installation will pass below the main areas of wetland Annex I habitat with no dewatering effect.

Along the open cut sections and the launch and reception of the trenchless crossings, the conditions may be wet, particularly since construction within the SAC will take place between 1 October and 31 January.

Therefore, localised dewatering will likely be required. The contractor(s) will ensure that the time the trench is open in the vicinity of certain features will only be as long as necessary for the installation of the pipeline. The required dewatering of the trench will be undertaken only as and when necessary to enable safe working and preparation for pipe installation (G132).

Elsewhere, open cut trenching will take place either within the track or down-gradient of it, to the south. Based on available hydrogeological information (see Appendix G), surface and sub-surface groundwater flows are likely already altered by the existing track, so whether the pipeline is installed within the track or immediately down-gradient of it, a highly localised effect of dewatering is expected. In addition, temporary water stops (or "stanks") will be installed within the trench prior to undertaking dewatering/draining activities, to prevent migration of water within the trench (G134).

Given the above, the potential effect of dewatering on the wetland qualifying features at Chobham Common is negligible.

Operation

During operation, groundwater flow interception could lead to changes in groundwater levels and flows on which wetland qualifying habitats are dependent, resulting in potential effects leading to habitat loss, fragmentation or modification.

The CSM developed for the site indicates that the presence of the pipeline will have a negligible effect on shallow groundwater flows in the vicinity of the route within this area.

In any open cut areas, where required, stanks will be installed at intervals through the pipe bedding and side fill (O7) to reduce any potential operational groundwater flow effects resulting in negligible changes.

In the unlikely event of pipeline leaks during operation there is a risk to water quality of groundwater on which wetland qualifying habitats are dependent. This could result in potential effects to habitats leading to loss, fragmentation or modification. However, pipeline integrity measures have been embedded into the design to reduce this risk. With these measures in place the likelihood of pipeline leaks is very small, and so the potential effects resulting from changes to groundwater quality through this impact pathway will be negligible. Further information regarding pollution risk, including calculations of worst-case scenario releases and environmental toxicity is provided in the Applicant's ES Chapter 14 Major Accidents [REP6-034][57].

7.5.3.2 Folly Bog

Construction

Within that part of the SAC that has also been designated as the Colony Bog and Bagshot Heath SSSI, the route has been designed to reduce the need for installing the pipeline below the groundwater table. This reduces any interaction with groundwater-dependent habitats, notably Folly Bog.

Within the hydrogeological catchment of Folly Bog, the Order Limits are largely elevated above the likely groundwater level. However, to the northeast of Folly Bog the Order Limits are at an elevation approximately within 1m of that of Folly Bog and there is the potential for the pipeline trench to intersect the level of groundwater supplying Folly Bog to the south. Therefore, temporary dewatering at this location may be required and there is potential for effects on groundwater dependant habitats to result. As the proposed trench would be approximately 1.5 m in depth and 0.6 m in width, any such dewatering is extremely unlikely to affect water levels in the adjacent mire, although a temporary and highly localised effect on qualifying habitat could result in the absence of mitigation or good practice measures.

The groundwater dependent habitats within Folly Bog relative to this location comprise Northern Atlantic wet heaths with *Erica tetralix* immediately to the south, separated from the Order Limits by the watercourse draining Folly Bog. This watercourse is a deep artificial watercourse, and likely separates

[57] Environmental Statement (Volume B). Chapter 14: Major Accidents. Application document 6.2. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-000172-6.2%20Chapter%2014%20Major%20Accidents.pdf

Folly Bog into areas supplied by groundwater flow from the north (from the direction of the Order Limits), and areas supplied by flow from the south. The Northern Atlantic wet heaths with *Erica tetralix* to the south of the Order Limits is degraded, likely through a combination of artificial drainage by the watercourse and lack of management.

To further reduce the potential for impact to the qualifying habitat at Folly Bog, good practice measures have been committed to by the Applicant. These measures include dewatering of the trench to be undertaken only as and when necessary to enable safe working and preparation for pipe installation (G132) and for temporary stanks to be installed within the trench prior to undertaking dewatering/draining activities, to prevent migration of water within the trench (G134).

Close to where the route enters Red Road, the Order Limits cross a 0.04 ha area of Northern Atlantic wet heaths with *Erica tetralix* habitat associated with Folly Bog; this habitat is of moderate to low groundwater dependency. At this location, the groundwater-dependent habitats are at the very southern edge of the Order Limits. The Limits of Deviation (i.e. the area within which the pipeline will be positioned) do not encompass any of this habitat and works within European sites will be undertaken in accordance with commitments set out in the REAC. As such, construction activity is restricted to the track and the dry habitats immediately alongside it.

Given the position of the Limits of Deviation, trench excavation will not be undertaken within the qualifying habitat of the SAC in the vicinity of Folly Bog.

Operation

The CSM developed for Folly Bog indicates that the presence of the trench or pipeline could also have a small effect on shallow groundwater flows in close vicinity of the proposed route, as shallow groundwater could be diverted locally away from the low to moderate groundwater-dependent vegetation nearest to the Order Limits.

Where required, stanks will be installed at intervals through the pipe bedding and side fill (O7) to reduce groundwater flow along the pipeline. Pervasive impacts to the integrity of the wider fen will therefore not arise.

In the event of pipeline leaks during operation there is a risk to water quality of groundwater on which qualifying features are dependent. Pipeline integrity measures have been embedded into the design to reduce this risk. With these measures in place the likelihood of pipeline leaks is very small, and so the potential effects resulting from changes to groundwater quality through this impact pathway will be negligible. Further information regarding pollution risk, including calculations of worst-case scenario releases and environmental toxicity, is provided by the Applicant in Chapter 14 of the Environmental Statement [APP-054][58].

7.5.3.3 Colony Bog and Bagshot Heath SSSI – excluding Folly Bog

Within the remainder of Colony Bog and Bagshot Heath SSSI section of the SAC, the route will be constructed away from Northern Atlantic wet heaths with *Erica tetralix* and Depressions on peat substrates of the *Rhynchosporion* habitats. The CSM developed for these areas indicated that the pipeline trench will be located above the water table and there will be negligible interaction between the route and qualifying habitats.

7.5.4 Conclusions on impacts from adverse changes to hydrology

Having regard to the mechanisms for impact described above, the Secretary of State is satisfied that the Order Limits have been sited to avoid the potential for impact to Northern Atlantic wet heaths with *Erica tetralix* and Depressions on peat substrates of the *Rhynchosporion* habitats as far as feasible. Furthermore, the Secretary of State is satisfied that with the implementation of mitigation measures,

[58] Environmental Statement (Volume B). Chapter 14: Major Accidents. Application document 6.2. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-000172-6.2%20Chapter%2014%20Major%20Accidents.pdf

specifically HRA1, HRA4 and those stated in the outline WMP [REP6-034][59] and secured through Requirements 12 and 6 of the Recommended DCO, no AEoI of the Thursley, Ash, Pirbright and Chobham SAC will occur from hydrological changes.

7.6 Assessment of impacts to qualifying habitats from changes to substrate properties

7.6.1 Pathway to effects by changes to substrate properties

The Conservation Objectives of the SAC identify the potential for changes to substrate properties to adversely affect the integrity of the SAC by reducing the extent of, and altering the natural processes supporting the Northern Atlantic wet heaths with *Erica tetralix* feature.

Project activities with the potential for adverse effects by the pathway of changes to substrate properties are identified as being:

- pipeline trench excavation;
- topsoil stripping within the construction working area; and
- use of non-native material to fill excavations.

The above activities could have implications for the drainage, nutrient cycling, or substrate chemistry that support the qualifying habitats of the SAC.

Direct impacts to the wetland qualifying habitats will be avoided through the use of trenchless construction techniques or otherwise minimised by alignment of the Limits of Deviation to avoid these habitats. To reduce vegetation loss and to protect soils, the existing access tracks will be utilised as haul routes where practicable.

Good practice measures set out in the REAC will be implemented to reduce impacts, including where necessary:

- topsoil stripping will be reduced to a minimum extent within European sites and SSSIs except where identified within the HRA. (some unavoidable stripping will take place as part of the trenching for the pipeline and in construction compounds where matting is not a workable alternative) (HRA4);
- where works in wet heath are unavoidable, effects on soils and surface vegetation will be reduced through the use of ground protection matting and use of appropriate machinery where practicable (G51);
- working width reduced to limit impacts on mature screening trees along Maultway and also reduce impacts to Colony Bog and Bagshot Heath SSSI and potential bat roosts. The approximate distance would be 3.8 km. (Grid ref: SU9097658802 to SU9252061386) (NW21);
- working width reduced along and adjacent to the existing track to reduce impacts on Chobham Common SSSI/NNR. This heathland is protected for several species of reptile including the rare sand lizard. This will consist of two areas over a combined distance of 1.6 km. (Grid ref: SU9691663545 to SU9776664071 and SU9826064307 to SU9878164515) (NW23 and NW24);
- topsoils and subsoils intended for reinstatement will be temporarily stockpiled as close to where they were stripped from as practicable (G155);
- different soil types and made ground will be stripped and stored separately where applicable (G159);
- a methodology will be produced for stripping, handling, storage and replacement of all soils to reduce risks associated with soil degradation. This will include (G151):
    - identification of appropriate plant to strip, reinstate and otherwise handle soils;
    - methods for compaction and grading of stockpiles;
    - methods for working in naturally wet soils; and

[59] Deadline 6 Submission - 8.51 Appendix B : Outline Water Management Plan (clean) - Revision 2.0. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN070005/EN070005-001351-8.51%20Appendix%20B%20Outline%20Water%20Management%20Plan%20(clean).pdf

    - specification of appropriate decompaction measures to be used during reinstatement.
- Once construction is complete, heathland within the SAC will be reinstated using natural regeneration, unless otherwise agreed with NE (HRA1).

7.6.2 Conclusion on the impacts from changes to substrate properties on Northern Atlantic wet heaths with *Erica tetralix*

Given these commitments, it is not anticipated that activities involving ground disturbance will compromise the substrate processes supporting qualifying habitats.

The Secretary of State, in his assessment, has given regard to the fact that soil disturbance and natural regeneration, when managed appropriately, is consistent with standard conservation measures for the restoration and management of heathland, and there is a high degree of confidence that disturbed habitats could be reinstated to pioneer heathland or acid grassland in the short to medium term by these methods.

The Secretary of State concludes that with the application of the measures described, the Project will not result in adverse effects to the integrity of the Northern Atlantic wet heaths with *Erica tetralix* qualifying habitat from changes to substrate properties.

7.7 Conclusion on impacts to the Thursley, Ash, Pirbright and Chobham SAC

NE concluded that there would be no AEoI alone or in combination on the Thursley, Ash, Pirbright and Chobham SAC; the ExA agreed with this conclusion.

The Secretary of State is satisfied that with the secured mitigation highlighted in the sections above that the Project will not lead to permanent loss of any qualifying features and that the extent of temporarily impacted habitat is a very low proportion of the available habitat in the SAC.

The Secretary of State is satisfied that the Order Limits have been sited to avoid as far as feasible the potential for impact from hydrological changes to Northern Atlantic wet heaths with *Erica tetralix* and Depressions on peat substrates of the *Rhynchosporion* habitats as far as feasible and that, with the application of secured mitigation, hydrological changes during either construction or operation of the Project will not impact these features.

Furthermore, the Secretary of State is satisfied that appropriate construction methods have been secured such that ground disturbance activities required for the construction of the Project will not compromise the substrate processes supporting qualifying habitats of the SAC.

The Secretary of State is satisfied that the above assessment is appropriate. He agrees with the Applicant, NE and the ExA and concludes that the Project alone and in-combination with other plans and projects will not have an AEoI of the Thursley, Ash, Pirbright and Chobham SAC

8 HRA Conclusions

The Secretary of State is content that sufficient information has been provided throughout the Examination to inform an Appropriate Assessment.

The Secretary of State identified LSE from:

- Water quality and/or nutrient release on ornithological features of the Solent and Southampton Water SPA and Ramsar;
- Water quality and/or nutrient release on ornithological features of the Solent and Dorset Coast pSPA;
- Water quality and/or nutrient release on habitat, plant and animal features of the Solent Maritime SAC;
- Direct loss of habitats supporting ornithological features of the Thames Basin Heaths SPA;
- Contamination of habitats supporting ornithological features of the Thames Basin Heaths SPA;
- Noise and visual disturbance of ornithological features of the Thames Basin Heaths SPA due to construction activities within the SPA;
- Noise and visual disturbance of ornithological features of the Thames Basin Heaths SPA due to increased recreational use within the SPA due to displacement of visitors to SANG during construction activities within the SANGs;
- Direct loss of habitat features of the Thursley, Ash, Pirbright and Chobham SAC;
- Adverse hydrological changes to habitat features of the Thursley, Ash, Pirbright and Chobham SAC; and
- Adverse changes to substrate properties and functioning of habitat features of the Thursley, Ash, Pirbright and Chobham SAC.

The Secretary of State has subjected each of these LSE to AA and a summary of the conclusions of each assessment is recorded below.

8.1 AA of Solent and Southampton Water SPA and Ramsar, Solent and Dorset Coast pSPA and Solent Maritime SAC

The Secretary of State is satisfied that appropriate measures have been secured for the management of water and of the potential for contamination at construction sites, such that the potential for nutrient or contaminant release to occur is low probability and the pathway for any such release to reach the Solent and Southampton Water SPA and Ramsar site, the Solent and Dorset Coast pSPA or the Solent Maritime SAC is broken except in extremely unlikely circumstances. These measures are set out in the CoCP [REP7-028], CEMP [REP6-030] and WMP [REP6-034] and are secured via Requirements 5 and 6 of the DCO.

The Secretary of State concludes that with the application of the secured measures there will be no AEoI of the Solent and Southampton Water SPA and Ramsar site, the Solent and Dorset Coast pSPA or the Solent Maritime SAC.

8.2 AA of Thames Basin Heath SPA

8.2.1 Direct loss of supporting habitat

The Secretary of State is satisfied that appropriate measures have been secured to ensure that:

- Ground disturbance works within the Thames Basin Heath SPA will be undertaken outside of the breeding season of qualifying features of the SPA such that there will be no direct loss of established breeding areas;

- Impacted supporting habitat of ornithological features of the SPA will regenerate such that any direct loss of habitat is temporary; and
- The extent of temporarily lost supporting habitat will be a minimal proportion of these habitats within the SPA.

He concludes that with these measures secured there will be no AEoI of the SPA from direct loss of supporting habitat. These measures are documented in the CEMP [REP6-030], the SMP [REP6-042] and the LEMP [REP7-032] and are secured via Requirements 5 and 6 of the DCO.

8.2.2 Contamination of supporting habitat

The Secretary of State is also satisfied that appropriate measures have been secured for the management of water and for the control of the potential for contamination at construction sites such that impacts to the supporting habitat of qualifying features of the Thames Basin Heaths SPA are unlikely to arise, and would be well contained should they do so. These measures are set out in the CoCP [REP7-028], CEMP [REP6-030] and WMP [REP6-034] and are secured via Requirements 5 and 6 of the DCO.

With the application of the secured measures the Secretary of State is satisfied that there will be no AEoI of the Thames Basin Heaths SPA from the contamination of supporting habitat.

8.2.3 Noise and visual disturbance from construction within the SPA

Mitigation in the form of Commitment G38 requires works within the Thames Basin Heaths SPA to occur between 1 October and 31 January and will therefore take place outside the breeding season for the qualifying features of the Thames Basin Heaths SPA unless otherwise agreed by NE. This commitment is included in the CEMP [REP6-030] and the Schedule of HRA Commitments and is secured via Requirement 6 of the DCO.

In the view of the Secretary of State this is sufficient to avoid an AEoI of the Thames Basin Heaths SPA from noise and visual disturbance.

8.2.4 Noise and visual disturbance from Displaced visitors to SANGs

The Secretary of State is satisfied that appropriate measures have been secured to minimise the potential for displacement of visitors from SANGs to the SPA during construction works within the SANGs and to limit the duration of construction within SANGs. These measures are documented in the CoCP [REP7-028], Table 1.5 of the Schedule of HRA Commitments [REP7-039], the Southwood Country Park SANG SSP [REP6-057] and the St Catherine's Road SANG SSP [REP6-059] and are secured via Requirements 5, 6 and 17 of the DCO.

The Secretary of State is satisfied that implementation of the secured measures will minimise the displacement of visitors to SANGs and he is content that there would consequently be no AEoI of the SPA resulting from works within the SANGs.

8.3 AA of Thursley, Ash, Pirbright and Chobham SAC

8.3.1 Loss of qualifying habitat

The Secretary of State is satisfied that measures have been secured for the regeneration of any area of European dry heaths that will be directly impacted during construction of the Project, and that therefore any loss of this habitat will be temporary. He is also satisfied that appropriate measures have been secured to minimise the extent of direct loss of this qualifying habitat such that its temporary loss will not have an AEoI of the Thursley, Ash, Pirbright and Chobham SAC.

The Secretary of State is satisfied that measures have been secured such that loss of Northern Atlantic wet heath and Depressions on peat substrates with *Rhynchosporion* habitats would be avoided and consequently there would be no AEoI of the SAC. Measures include the use of trenchless crossings, alignment of the Limits of Deviation away from qualifying habitats, adopting reduced corridor widths, use of lighter vehicles in sensitive areas and use of protective matting within areas of qualifying features of

the SAC. The measures are documented in the LEMP [REP7-032] and secured via Requirement 12 of the DCO.

8.3.2 Adverse hydrological changes

The Secretary of State is satisfied that, in the siting of the Order Limits, due regard has been taken of the mechanisms for hydrological changes to habitats in the context of conceptual site models and that this has enabled the Applicant to avoid the potential for impact to Northern Atlantic wet heaths with Erica tetralix and Depressions on peat substrates of the *Rhynchosporion* habitats as far as feasible. Furthermore, the Secretary of State is satisfied that with the implementation of mitigation measures, specifically HRA1, HRA4 and those stated in the outline WMP [REP6-034] and secured through Requirements 12 and 6 of the Recommended DCO, no AEoI of the Thursley, Ash, Pirbright and Chobham SAC will occur from hydrological changes.

8.3.3 Adverse changes to substrate properties and functioning

The Secretary of State is satisfied that appropriate construction methods have been secured such that ground disturbance activities required for the construction of the Project will not compromise the substrate processes supporting qualifying habitats of the SAC and that there would consequently be no AEoI.

8.4 Overall conclusion

After careful consideration of all submissions made throughout the Examination, the Secretary of State has concluded in line with the recommendations of the ExA and the advice of NE that, with the implementation of the mitigation measures secured by the DCO, no AEoI of any European sites would occur as result of the proposed Project alone or in combination.

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