POWERFUEL

Portland energy recovery facility

Updated (2)
Shadow Appropriate Assessment
ERRATUM VERSION
January 2022

1.0 Introduction

1.1 This shadow Appropriate Assessment has been prepared in support of a planning application for the proposed development of an Energy Recovery Facility (ERF) with ancillary buildings and works including administrative facilities, gatehouse and weighbridge, parking and circulation areas, cable routes to ship berths and existing off-site electrical sub-station, with site access though Portland Port from Castletown.

1.2 This document has been updated to reflect the outcomes of further air quality modelling of traffic flows to and from the Isle of Portland. Since the previous document was written, background deposition rates and concentrations of pollutants for protected sites have been updated on the Air Pollution Information Service (APIS) website. The update took place at the end of March 2021 and the new baseline figures have been used in both the air quality modelling and this assessment. In January 2022 a further update to the assessment was undertaken to reflect adjustments to the in-combination assessment. Section 7 has been revised to reflect these changes. Paragraph 6.19 has also been updated in this latest version.

1.3 The stack location lies within 10km of five statutory designated sites within the national site network (NSN). Four of these are terrestrial sites: The Isle of Portland to Studland Cliffs Special Area of Conservation (SAC), Chesil Beach and the Fleet Special Protection Area (SPA), Chesil and the Fleet SAC and Crookhill Brick Pit SAC. Chesil Beach and the Fleet is also a Ramsar site. The 10km area of search also encompasses parts of the Studland to Portland SAC, a marine site. The location of the site relative to these sites is shown in figure 1.

1.4 The use of a 10km area of search to identify sites within the NSN which may be impacted by the proposed project was agreed with Natural England following the production of the initial air quality modelling. This modelling shows that pollutants from the ERF are below 1% of the relevant critical level and load thresholds within 2km of the site for the most sensitive habitats found within the Isle of Portland to Studland Cliffs SAC and the Chesil and the Fleet SAC. Over 5km from the site the contributions from the facility are imperceptibly small. Based on findings of the modelling it was confirmed that the 10km area of search was appropriate.

1.5 These sites receive statutory protection under the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations'). The Habitats Regulations afford a high level of protection to sites classified as areas that hold significant populations of certain bird species (SPAs). They also afford the same level of high protection to tracts of land supporting habitats or rare species (other than birds) considered scarce or vulnerable at a European community level (SACs).

1.6 Ramsar sites are designated as wetlands of international importance that are afforded similar legislative protection to SPAs and SACs. The government has issued policy statements relating to the special status of Ramsar sites. This extends the same protection afforded to SPAs and SACs.

1.7 Under the Habitats Regulations, Dorset Council (DC) is a competent authority, responsible for ensuring that development management decisions do not adversely affect the integrity of NSN sites. This document provides information for the Habitats Regulations Assessment that DC will need to undertake in determining the planning application for the site. This document considers the implications of the project for the conservation objectives of the five NSN sites to determine whether the project will have an adverse effect on the integrity of the sites, either alone, or in combination with other plans and projects.

2.0 Legislative context and the tests of the Habitats Regulations

2.1 SACs and SPAs form part of a network of nature protection areas within the UK known as the National Site Network (NSN) and are protected in the determination of a planning application. Under Regulation 63 of the Habitats Regulations the competent authority is responsible for assessing whether land use plans or proposed developments could adversely affect a NSN site. This requires a process known as a Habitats Regulations Assessment (HRA), encompassing two tests required under Regulation 63(1) of the Habitats Regulations.

- **Test 1:** having ascertained that the plan is not directly connected to, or necessary for site management for nature conservation, the first test of the HRA, commonly referred to as a screening test, considers whether or not a plan or project is likely to have a significant effect on an NSN site either alone or in combination with other plans or projects. A significant effect is any effect that would undermine the conservation objectives for the respective NSN site and may include physical loss and/or damage of a habitat, disturbance effects, and changes to water availability, deposition of contaminants through changes in air quality etc.
- **Test 2:** The second test of the HRA is relevant to those plans or projects that are screened as likely to have a significant effect alone or in combination with other plans or projects, and requires an appropriate assessment. The role of the appropriate assessment is to consider the implications of the plan or project for the conservation objectives of the NSN sites in question, and to determine whether it will have an adverse effect on the integrity of the site. In carrying out an appropriate assessment, a local authority must have regard to the manner in which the project is proposed to be carried out, or to any conditions or restrictions subject to which it proposes that the consent, permission or other authorisation should be given.

2.2 A likely significant effect is any effect that is likely to undermine the site's conservation objectives, in light of the characteristics and specific environmental conditions of the SAC/SPA. The likely significant effect test must be based on objective information and the risks must be real, not hypothetical (Boggis vs Natural England 2009).

2.3 A recent European Court Judgment (ECJ) People Over Wind and Sweetman v Coillte Teoranta (C-323/17) has altered the process of screening for likely significant effects by overturning the 2008 Hart District Council vs. Secretary of State judgment (2008), known as Dilley Lane. The Dilley Lane judgment stated *"there is no legal requirement that a screening assessment… must be carried out in the absence of any mitigation measures that form part of that plan or project".*

2.4 The recent People Over Wind and Sweetman ruling states that *"it is not appropriate, at the screening stage, to take account of measures intended to avoid or reduce the harmful effects of the plan or project on that site"*. This means that mitigation measures must be excluded from the assessment of whether a project is likely to have a significant effect, either alone or in combination with other plans and projects.

2.5 In line with the ECJ ruling in Briels (2014) the adverse effect on integrity test that forms part of the appropriate assessment can *"take account of the protective measures forming part of the project aimed at avoiding or reducing any direct adverse effects for the site in order to avoid any adverse effects on integrity".*

2.6 The ECJ ruling in Grace and Sweetman (C-164/17) highlights that a measure can only be considered mitigation *"where it is certain it will make an effective contribution to avoiding harm, guaranteeing beyond all reasonable doubt no adverse effect".*

2.7 Guidance produced by the UK government highlights key principles to be considered by the competent authority when considering if an appropriate assessment is required. It notes that measures that have been specifically added to achieve the purpose of reducing its harmful effects on a habitats site should not be considered at the screening stage.

2.8 The government guidance notes that *"the scope and content of an appropriate assessment will depend on the nature, location, duration and scale of the proposed plan or project and the interest features of the relevant site. 'Appropriate' is not a technical term. It indicates that an assessment needs to be proportionate and sufficient to support the task of the competent authority in determining whether the plan or project will adversely affect the integrity of the site".*

Conservation objectives

2.9 Conservation objectives are identified for all NSN sites and cover all features that qualify the site for classification or designation. The conservation objectives apply under the Habitats Regulations, Habitats Directive and Wild Birds Directive, and must be considered during a Habitats Regulations Assessment, including an Appropriate Assessment.

3.0 Description of development and scope of assessment

3.1 The proposed development is for an Energy Recovery Facility with ancillary buildings and works including administrative facilities, gatehouse and weighbridge, parking and circulation areas, cable routes to ship berths and existing off-site electrical sub-station, with site access though Portland Port from Castletown. Further details of the proposals can be found in Chapter 2 of the Environmental Statement (ES) submitted in support of the planning application.

3.2 The initial ecological evaluation of the scheme identified habitats within the NSN sites that would be sensitive to additions of certain pollutants, notably nitrogen and ammonia. Throughout the development of the proposed scheme Fichtner (the air quality consultants) and Terence O'Rourke (the ecology consultants) have worked together to test various options relating to stack height, stack location and the implementation of additional technologies to the process to reduce these emissions (particularly nitrogen and ammonia) on relevant areas of the NSN sites. The air quality reports produced by Fichtner can be found in technical appendix D2 of the ES, with additional reports provided in appendices 3.1 and 3.4 of the ES addendum.

3.3 The final stack height is the result of efforts to reduce the deposition of aerial pollutants on NSN sites in close proximity to the application site. As such the increase in stack height is regarded as mitigation (as defined by ECJ rulings and government advice - see paragraphs 2.4 – 2.7). This necessitates the undertaking of an appropriate assessment to assess the implications of the project for the conservation objectives of the NSN sites.

3.4 Other measures have also been proposed, such as the requirement for a Construction Environmental Management Plan (CEMP) to reduce the risk of impacts on the NSN sites (and other sensitive ecological sites, as assessed in the ES). These measures are also considered to be mitigation and therefore require the undertaking of an appropriate assessment.

3.5 Section 4 of this document outlines the interest features of the five sites within the NSN that fall within 10km of the application boundary. Section 5 sets out the likely significant effects assessment where objective information is used to determine if the proposed development will, in the absence of mitigation measures, result in any effect that is likely to undermine the designated site's conservation objectives, in light of the characteristics and specific environmental conditions of the SAC/SPA/Ramsar site.

3.6 Section 5 also sets out the rationale for the exclusion of certain likely significant effects from further assessment at this stage. The likely significant effect test must deal with risks that are real, not hypothetical. Potential plausible risk pathways are examined, but if no risk of likely significant effects is identified, these risks are discounted from further assessment.

3.7 Section 6 is the appropriate assessment of the likely significant effects of the scheme on interest features of the relevant NSN sites as identified in Section 5. Section 6 deals with impacts from the proposals alone. Section 7 assesses the likely significant effects of the proposed project in-combination with other plans and projects.

3.8 Section 8 sets out the conclusions of the shadow appropriate assessment provided by the applicant for the benefit of the competent authority. In undertaking its own Habitats Regulations Assessment of the proposed project, the competent authority will form its own view on the impacts of the scheme on the NSN.

4.0 Baseline

4.1 The following section sets out the location, designation criteria and conservation objectives of the five NSN sites to be considered in this shadow appropriate assessment. The locations of these sites relative to the application site are shown in figure 1. Copies of the SAC/SPA and Ramsar citations are included in Appendix 1.

Chesil Beach and the Fleet SPA and Ramsar

4.2 The classified site qualifies as a SPA under article 4.1 of the Directive (79/409/EEC) as 1% or more of the biogeographical populations of one regularly occurring migratory species regularly use the site. The area regularly supports:

- 70 breeding pairs of little tern (*Sternula albifrons*): five-year mean of 54 pairs (1980-1984), representing 2.5% of the GB breeding population.

4.3 The classified site qualifies as a SPA under article 4.2 of the Directive (79/409/EEC) as 1% or more of the biogeographical populations of one regularly occurring migratory species regularly use the site. Over winter the area regularly supports:

- 1% of the North-western Europe population of wigeon (*Mareca penelope*): five-year peak mean 1980-81-1984-85, 4,594 individuals.

4.4 The information used in the assessment is set out in the SPA citation (site code: UK9010091). The citation was compiled in July 1985 and updated in November 2017.

4.5 The same SPA site qualifies for designation as a Ramsar site for supporting breeding little tern. It is also an important site for breeding common tern (*Sterna hirundo*) and ringed plover (*Charadrius histicula*). The Fleet is notable for the diversity of wintering waders and wildfowl. Alongside the wigeon population described above the site supports pochard (*Aythya ferina*), teal (*Anas crecca*), pintail (*Anas acuta*), mallard (*Anas platyrhynchos*), shoveler (*Spatula clypeata*), tufted duck (*Aythya fuligula*) and goldeneye (*Bucephala clangula*).

4.6 The SPA supports the largest resident mute swan (*Cygnus olor*) population in Britain and wintering dark-bellied brent geese (*Branta bernicula bernicula*).

4.7 Chesil Beach is one of the five largest shingle beaches in Britain. The small pebblebed shingle in the western area supports a rich flora characteristic of unstable shingle. The Fleet is the largest regularly-tidal lagoon in Britain and contains a mixed population of eelgrasses (*Zostera* spp), spiral tasselweed (*Ruppia cirrhosa*), a rare stonewort (*Chara* sp) and diverse marine algae communities. The more marine influenced areas support populations of the sponge *Suberites massa*, the goby *Gobins couchi*, burrowing anemone *Scolanthus callimorphus* and the polychaete *Sabella flabellata*.

4.8 At the time the citation was prepared the eastern end of Chesil Beach was believed to support the only population of scaly cricket (*Pseudomogoplistes squamiger*) in the British Isles. In 1998 a second colony was discovered in Devon.

Chesil and The Fleet SAC

4.9 This SAC site covers 1631.63ha and was designated in April 2005 (Site code:UK0017076). The site supports the following Annex I habitat types: Annual vegetation of drift lines, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*),

Coastal lagoons (a priority habitat), Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruitcosi*) and perennial vegetation of stony banks.

4.10 The Fleet is the largest example of a lagoonal habitat in England and has features of both lagoonal inlets and percolation lagoons. It is bordered by the fossil shingle barrier beach structure of Chesil Beach, through which sea water percolates into the lagoon, but most of its water exchange occurs through the narrow channel that links it to Portland Harbour. A low freshwater input produces fully saline conditions throughout most of the Fleet, with reduced salinity occurring only in the west. The lagoon is extremely sheltered from wave action and has weak tidal streams, except in the eastern narrows and entrance channel. The tidal range is much smaller and the temperature range far greater than on the open coast. The lagoon supports extensive populations of two species of eelgrass *Zostera* and three species of tasselweed *Ruppia*, including the rare spiral tasselweed *R. cirrhosa*, and a diverse fauna that includes a number of nationally rare and scarce species.

4.11 The Annex I habitat Annual vegetation of drift lines is present on the inner shore of Chesil Bank and the shoreline of Portland Harbour. The inner shore of Chesil Bank supports extensive drift line vegetation dominated by sea beet (*Beta vulgaris* subsp. *maritima*) and orache (*Atriplex* spp). On the shoreline of Portland Harbour this feature is additionally represented by a small area of sea sandwort (*Honckenya peploides*) and sea rocket (*Cakile maritima*).

4.12 Over a large part of the designated site, the strandline vegetation appears to exist in a dynamic equilibrium with the shrubby sea-blite (*Suaeda vera*) dominated scrub, which is described below.

4.13 The Annex I habitat Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruitcosi*) forms a band of shrubby sea-blite and sea-purslane (*Atriplex portulacoides*) that lines much of the 13 km length of the seaward margin of the Fleet and forms a clear zone between the Fleet and the shingle vegetation of the Chesil Bank. It is also found above the upper limit of tidal inundation in ground depressions where saline conditions occur, for example, at the southern end of Portland Harbour shore.

4.14 Two other species, sea beet and the lichen *Xanthoria parietina*, occur in low abundance. It appears to exist in a dynamic equilibrium with the sea beet dominated drift line vegetation, for which the site has been separately selected. This replaces the scrub in areas subject to disturbance by waves or erosion, and is in turn displaced by the scrub after disturbance ceases.

4.15 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) occur within the site although no specific details are provided in the designation documentation. A report published by Footprint Ecology in March 2019 identified this habitat as occurring in sheltered areas along the Fleet shoreline, particularly tidal inundation pools. The largest stands were found around Abbotsbury Swannery.

4.16 The 28 km-long shingle bar of Chesil Beach, with the contiguous Portland Harbour shore, is an extensive representative of perennial vegetation of stony banks on the south coast of England, and most of it is relatively undisturbed by human activities. Much of the shingle bar is subject to wash-over and percolation in storm conditions and is therefore sparsely vegetated. It supports the most extensive occurrences of the rare sea-kale (*Crambe maritima*) and sea pea (*Lathyrus japonicus*) in the UK, together with other grassland and lichen-rich shingle plant communities typical of more stable conditions, especially towards the eastern end of the site.

Isle of Portland to Studland Cliffs SAC

4.17 This SAC site covers 1447.5ha and was designated in April 2005 (Site code:UK0019861). It supports the following Annex I habitat types: Annual vegetation of drift line, vegetated sea cliffs of the Atlantic and Baltic coasts, semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) and populations of the Annex II species early gentian (*Gentianella anglica*).

4.18 Isle of Portland to Studland Cliffs, including the detached peninsula of Portland, with St Albans Head to Durlston Head, forms a single unit of cliffed coastline some 40 km in length. The cliffs are formed of hard limestones, with chalk at the eastern end, interspersed with slumped sections of soft cliff of sand and clays. Along these cliffs the Annex I habitat vegetated sea cliffs of the Atlantic and Baltic coasts occurs.

4.19 The cliffs support species-rich calcareous grassland with species that are rare in the UK, such as wild cabbage (*Brassica oleracea* var. *oleracea*), early spider-orchid (*Ophrys sphegodes*) and Nottingham catchfly (*Silene nutans*). The Portland peninsula, extending 8 km south of the mainland, demonstrates very clearly the contrast between the exposed western and southern coasts, with sheer rock faces and sparse maritime vegetation, and the sheltered eastern side, with sloping cliffs supporting scrub communities, where wood spurge (*Euphorbia amygdaloides*) grows in grassland.

4.20 The Annex I habitat semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) occurs at this SAC in both inland and coastal situations on both chalk and Jurassic limestone. The SAC contains extensive species-rich examples of CG4 *Brachypodium pinnatum* grassland in the southern part of its UK range. Smaller areas of CG2 *Festuca ovina – Avenula pratensis* grassland occur on shallow soils on steeper slopes. Transitions from calcareous grassland to both chalk heath and acid grassland are also present. The SAC has well-developed terricolous and saxicolous lichen and bryophyte communities associated with open turf, chalk rock and pebbles, and flinty soils. The SAC is also an important orchid site.

4.21 A report commissioned from the Dorset Environmental Records Centre (DERC) noted that CG4 grassland is widespread across the Island in and around abandoned quarries, remnants of the old common at the Bill and Verne and on the wide undercliffs (although stands are localised within the SAC). Of the three limestone grasslands (CG1, CG3 and CG4) CG1 is by far the most important for lower plants, providing a habitat for several key Mediterranean bryophytes and lichens (Edwards, 2021 – see Appendix 2).

4.22 The Annex I habitat Annual vegetation of drift lines is present as a qualifying feature, but is not the primary reason for the selection of the SAC. This habitat occurs on deposits of shingle lying at or above the mean high-water mark of spring tides. These areas are subject to periodic displacement or overtopping by high tides and storms. The vegetation communities are largely composed of annual or short-lived perennial species.

4.23 The presence of populations of early gentian is a primary reason for the selection of the SAC. Together with St Albans Head to Durlston Head, the SAC supports important long-standing populations of early gentian numbering several thousands of plants in floristically-rich calcareous grassland.

Crookhill Brick Pit SAC

4.24 Crookhill Brick pit covers 4.46ha and is designated for supporting a population of the Annex II species great crested newt (*Triturus cristatus*). The SAC contains several ponds that support great crested newts, including one pond which has been recorded to have one of the highest counts of the species in Dorset. The SAC also contains a variety of habitats used by the great crested newt in the terrestrial phase, including grassland, scrub and quarry spoil. The newer ponds were created as part of a mitigation project for the construction of a waste transfer station. The disused brickpit also has important geological features (exposure of Lower and Middle Oxford Clay).

Studland to Portland SAC

4.25 Studland to Portland SAC covers 33184.28ha and is designated for supporting the Annex I habitat reefs. This SAC contains numerous areas of reef in many forms, which exhibit a large amount of geological variety and biological diversity. Features of particular interest within the Studland Bay to Ringstead Bay area include a series of limestone ledges (up to 15m across) protruding from shelly gravel at Worbarrow Bay, which support a rich sponge and sea fan community; dense brittlestar beds (*Ophiothrix fragilis*)) on shale reefs extending from Kimmeridge; a unique reef feature, known as St Albans ledge, extending out over 10km offshore and subject to strong tidal action; and an area of large limestone blocks known as the “seabed caves”. The Portland Reefs are characterised by flat bedrock, limestone ledges (Portland stone), large boulders and cobbles. On the western side of Portland Bill, rugged limestone boulders provide deep gullies and overhangs. Mussel beds (*Mytilus edulis*) are found to occur in very high densities on bedrock associated with strong currents to the southeast of Portland Bill.

Chesil Beach and The Fleet SPA conservation objectives

4.26 The conservation objectives for the SPA have been prepared by Natural England. With regard to the SPA and the individual species and/or assemblage of species for which it has been classified (the ‘qualifying features’), and subject to natural change; the conservation objectives aim to ensure that the integrity of the SPA is maintained or restored as appropriate, and ensure that the SPA contributes to achieving the aims of the Wild 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
- The distribution of the qualifying features within the SPA

Ramsar

4.27 For Ramsar sites, a decision has been made by Defra and Natural England not to produce Conservation Advice packages, instead focussing on the production of High Level Conservation Objectives. As the provisions on the Habitats Regulations relating to HRAs extend to Ramsar sites, Natural England considers the Conservation Advice packages for the overlapping European Marine Site designations to be, in most cases, sufficient to support the management of the Ramsar interests. If there are Ramsar qualifying features not covered by overlapping European Marine Sites, Natural England will advise on the best approach on addressing these (e.g. to produce advice on a feature basis) if there is an operational risk.

Chesil and The Fleet SAC conservation objectives

4.28 The conservation objectives for the SAC have been prepared by Natural England. With regard to the SAC and the natural habitats and/or species for which it has been designated (the 'qualifying features'), and subject to natural change; the conservation objectives aim to ensure that the integrity of the SAC is maintained or restored as appropriate, and 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
- The structure and function (including typical species) of qualifying natural habitats
- The supporting processes on which qualifying natural habitats rely

4.29 The supplementary advice on conserving and restoring site features, which accompanies the conservation objectives, sets an objective for air quality of: maintaining, as necessary, the concentrations and deposition of air pollutants to at, or below, the site-relevant critical loads or levels given on the Air Pollution Information System (APIS) website. This advice is relevant to the Annex I habitats perennial vegetation of stony banks, Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) and Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruitcosi*).

Crookhill Brick Pit SAC conservation objectives

4.30 The conservation objectives for the SAC have been prepared by Natural England. With regard to the SAC and the natural habitats and/or species for which it has been designated (the 'qualifying features'), and subject to natural change; the conservation objectives aim to ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the SAC contributes to achieving the Favourable Conservation Status of its qualifying features, 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
- The distribution of the qualifying features within the SAC

4.31 The supplementary advice on conserving and restoring site features, which accompanies the conservation objectives, sets an objective for air quality of: maintaining, as necessary, the concentrations and deposition of air pollutants to at, or below, the site-relevant critical loads or levels given on the APIS website. This relates to the supporting habitat used by great crested newts, both for breeding and during the terrestrial phase of their lifecycle.

Isle of Portland to Studland Cliffs SAC conservation objectives

4.32 The conservation objectives for the SAC have been prepared by Natural England. With regard to the SAC and the natural habitats and/or species for which it has been designated (the 'qualifying features' listed below), and subject to natural change; these aim to ensure that the integrity of the SAC is maintained or restored as appropriate, and ensure that the SAC 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 the 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
- The distribution of the qualifying species within the SAC

4.33 The supplementary advice on conserving and restoring site features, which accompanies the conservation objectives, sets an objective for air quality of: maintaining, as necessary, the concentrations and deposition of air pollutants to at, or below, the site-relevant critical loads or levels given on the APIS website. This advice is relevant to the Annex I habitats vegetated sea cliffs of the Atlantic and Baltic coasts and semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) and encompasses the populations of the Annex II species early gentian.

Studland to Portland SAC conservation objectives

4.34 The conservation objectives for the SAC have been prepared by Natural England. With regard to the SAC and the natural habitats and/or species for which it has been designated (the 'qualifying features' listed below), and subject to natural change; these aim to ensure that the integrity of the SAC is maintained or restored as appropriate, and ensure that the SAC contributes to achieving the Favourable Conservation Status of its qualifying features, by maintaining or restoring**:**

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

5.0 Likely significant effect (LSE) test

5.1 The first test of Regulation 63 of the Habitats Regulations requires an assessment of whether the emissions from the scheme, or any other activities, are likely to have a significant effect on the NSN sites in question, either alone or in combination with other plans and projects.

5.2 As set out in paragraph 2.2 a likely significant effect (LSE) is any effect that is likely to undermine the designated site's conservation objectives, in light of the characteristics and specific environmental conditions of the SAC/SPA/Ramsar. The likely significant effect test must be based on objective information and the risks must be real, not hypothetical.

5.3 The following potential impacts associated with the proposed ERF on sites within the NSN have been identified for consideration in the LSE assessment:

- Dust generation associated with construction of the ERF
- Run-off from the site, fuel spill or release of other contaminants (during construction or operation)
- Emissions from traffic associated with the ERF (construction and operation)
- Emissions from the ERF during operation
- Noise and visual disturbance during construction and/or operation of the ERF
- Loss or disturbance of habitats functionally linked to the SPA around Portland Harbour during construction or operation

5.4 The potential for LSE to occur from these impacts is considered for all the five sites identified in section 2. This section sets out the assessment of the LSE occurring at any one of the five sites for each activity. Where it is considered that there is no realistic impact pathway for LSE to occur, the evidence to underpin this decision has been provided. This section concludes with a list of LSE identified and the sites these relate to. There are then taken forward for appropriate assessment alone in Section 6 and in-combination in Section 7.

Potential LSE – Dust generation during construction of the ERF

5.5 The Institute of Air Quality Management (IAQM) has produced guidance on the screening the likely impacts related to dust emissions (Holman et al, 2016). The guidance states that the screening *"is deliberately chosen to be conservative and will require assessment for most schemes".* It states that assessment will normally be required where an ecological receptor is within 50m of the boundary of the site, or 50m of the routes used by construction vehicles on the public highway up to 500m from the site entrances.

5.6 Crookhill Brick Pit SAC and Studland to Portland SAC are all located well beyond the conservative zone of impact identified by IAQM for assessment. No realistic potential impact pathway relating to dust generation has been identified on these sites due to the distance between these NSN and the application boundary.

5.7 Chesil and the Fleet SAC lies over 100m from the application boundary and Chesil Beach and the Fleet SPA and Ramsar lies over 1.5km from the application boundary. which stops short of the roundabout on the A354. Construction vehicles will have already travelled over 500m from the construction site on internal port roads to reach this roundabout. This is beyond the distance where impacts from dust generated by

trackout are considered to require assessment (see paragraph 5.5). Cabling works will be required along Lerret road to connect the ERF to the substation. These works will be over 50m from the boundary for Chesil and the Fleet SAC. No realistic potential impact pathway relating to dust generation has been identified on these sites due to the distance between these NSN and the application boundary.

5.8 There is the potential for dust generation to impact on the Isle of Portland to Studland Cliffs SAC due to the proximity of the site to the application boundary.

Summary: Potential for LSE relating to generation of dust on interest features of Isle of Portland to Studland Cliffs SAC only.

Potential LSE – Pollution of marine environment during construction or operation of the ERF

5.9 There is the potential for run-off from the site, fuel spill or release of other contaminants (during construction or operation) to enter Portland Harbour. Although not part of the NSN, the harbour is hydrologically linked to the Fleet and a realistic pathway for pollutants to affect habitats within Chesil Beach and the Fleet SPA and Ramsar exists. The following Annex I habitats found within the Chesil and the Fleet SAC (Annual vegetation of drift lines and coastal lagoons) may also be impacted by any pollution event. Given the size of Portland Harbour (c10km^2), the predominantly anti-clockwise tidal movement and the distance between the site and the boundary of the NSN, pollution events would have to be of sufficient scale for LSE to occur within the NSN.

5.10 Studland to Portland SAC lies beyond the outer wall of Portland Harbour. Although hydrologically linked to the site via the marine environment, no activities associated with the construction or operation of the ERF are considered to be of a scale that would result in a pollutant reaching this site in sufficient volumes or concentrations to result in likely significant effects. Due to the distance between the application site and Studland to Portland SAC, and the nature of the activities associated with this development, pollution events would have to be of sufficient scale for LSE to occur within the NSN..

5.11 There is no hydrological link between the application site and Crookhill Brick Pit SAC or the Isle of Portland to Studland Cliffs SAC. Due to the lack of hydrological connectivity, no realistic potential impact pathway relating to pollution of the marine environment has been identified on these sites.

5.12 Based on established case law, operational activities, such as the removal of residual incinerator bottom ash material (post-combustion) from the site via ship have been screened out due to the inert nature of the material leaving the site.

Summary: Potential for LSE relating to pollution of marine environment during construction or operation of ERF on interest features of Chesil Beach and the Fleet SPA and Ramsar, Chesil and the Fleet SAC and Studland to Portland SAC.

Potential LSE – Noise and visual disturbance during construction or operation of the ERF

5.13 Noise and visual impacts have been ruled out primarily due to the distance of the project from the SPA/Ramsar. The University of Hull has produced a Waterbird Disturbance Mitigation Toolkit to inform estuarine planning and construction projects (Cutts *et al*, 2013). The toolkit provides information on species' responses to varying noise levels and sources of visual disturbance.

5.14 Overall the toolkit concludes that noise levels below 50dB promoted a low level response in most estuarine species covered in the toolkit. A low level of response is classed as one where there is unlikely to be an observable response to the noise, e.g. reduction in feeding, birds scanning for danger etc. It should be noted that an observable reaction in a bird species is not the same as an impact. A brief change in behaviour in response to a noise event will not necessarily have any impact on the individual(s) concerned.

5.15 The toolkit suggests that the most sensitive species of wader will demonstrate an alert response to certain forms of visual disturbance at ranges of c300m. In certain circumstances (in countries where brent geese are a quarry species) brent geese have been recorded responding to disturbance stimuli at ranges of 350m.

5.16 A report produced by Footprint Ecology in 2015 assessed the response of birds (waders and wildfowl) to sources of disturbance on the Fleet. Across three sites the report found that dog-walking was the main activity associated with disturbance. Birds generally responded when people were within 100m, although responses were recorded up to 170m from the source (Liley et al, 2015).

5.17 The application boundary is over 1.7km from the Chesil Beach and the Fleet SPA and Ramsar at the closest point. No published research has been found to show that the bird species associated with the SPA/Ramsar will show an alert or behavourial response to visual stimuli at this range. Noise levels associated with both construction and operational activities around the ERF will not be above 50dB at the boundary of the SPA. The changes in traffic flows on the A354 will not result in significant changes in noise levels where the road borders the SPA/Ramsar. No realistic impact pathway relating to noise and visual disturbance for breeding or wintering bird within the SPA/Ramsar has been identified.

5.18 There are no species considered to be sensitive to noise and visual disturbance associated with the Isle of Portland to Studland Cliffs SAC, Chesil and the Fleet SAC and Studland to Portland SAC. No realistic impact pathway relating to noise and visual disturbance has been identified for these sites.

5.19 Impacts on breeding great crested newts at Crookhill Brick Pit SAC associated with noise and visual disturbance can be screened out due to the distance between the application site and the SAC. No realistic impact pathway relating to noise and visual disturbance has been identified for this site.

Summary: No potential for LSE relating to noise and visual disturbance during construction or operation of ERF on interest features of any of the five NSN sites.

Potential LSE - Loss or disturbance of habitats functionally linked to the Chesil Beach and the Fleet SPA/Ramsar around Portland Harbour during construction or operation of the ERF

5.20 The little tern breeding colony is located at the eastern end of the Fleet. Little tern are almost exclusively coastal feeders, foraging on open shores, coastal lagoons and the outer parts of estuaries. Breeding little tern typically forage within 5km of the breeding colony (Cabot and Nisbet, 2013). The shallow waters around the shores of Portland Harbour may be used by foraging birds.

5.21 The waters of the harbour will not be directly impacted by the construction works and foraging birds will be habituated to ship movements, activity around the port and on-board ships and waterborne recreational activities within Portland Harbour. The construction and operation of the ERF are considered unlikely to impact on foraging

little tern as there is no habitat directly or indirectly impacted by the proposals that would be preferentially selected by foraging little tern within Portland Harbour. Foraging areas used by terns vary temporarily and spatially as prey species respond to a wide range of influences such as water temperature, tide state, water depth, substrate and predator abundance.

5.22 Wintering wigeon feed on plant material, obtained by grazing on land or from the water surface or very shallow water (Snow and Perrins, 1998). The waters of Portland Harbour are too deep to be used by foraging wigeon. The shallow waters of the Fleet provide ideal foraging habitat for this species. The construction and operation of the ERF are considered unlikely to impact on foraging wigeon as there is no habitat directly or indirectly impacted by the proposals that would be preferentially selected by feeding wigeon within Portland Harbour.

5.23 Breeding common tern and ringed plover are identified as interest features of Chesil Beach and the Fleet Ramsar. The breeding common tern may forage within Portland Harbour, as this species is an opportunistic feeder that uses a wide range of habitats, including lagoons, brackish water, freshwater and the open sea. During the breeding season the majority of breeding terns forage within a few kilometres of the breeding colony, generally feeding in water less than 5 metres deep (Cabot and Nisbet, 2013).

5.24 Ringed plover breed on sandy or stony coastal habitats, nesting close to water and feeding on terrestrial and coastal invertebrates (Snow and Perrins, 1998). The habitats around the application site do not offer suitable foraging habitat for breeding ringed plover.

5.25 Wintering teal, mallard, pintail, shoveler, tufted duck, pochard and goldeneye, along with the resident mute swan population, are identified as interest features of Chesil Beach and the Fleet Ramsar.

5.26 Teal feed primarily on seeds during the winter obtained by filter feeding on mud or water or upending in shallow water. Although present on estuaries and saltmarshes during the winter, this species does not winter on open coastal waters. Pintail winter on sheltered coastal waters, particularly estuaries and lagoons, feeding in waters between 10 and 30cm deep. Mallard is an opportunistic feeder found in a wide range of habitats, including shallow coastal waters, generally avoiding water depths of more than a few metres for resting and foraging in water of less than 1m depth. Due to a specialised feeding strategy, shoveler typically avoid marine waters (all Snow and Perrins, 1998). The shallow, sheltered waters of the Fleet provide ideal foraging habitat for all these species.

5.27 The Fleet provides ideal foraging habitat for all the dabbling duck species discussed in paragraph 5.26. The maximum water depth of Portland Harbour is 16 metres below chart datum, with an average depth of 12 metres. Towards Chesil Beach water depth is reduced to c4 metres. As such the harbour does not provide extensive areas of suitable foraging habitat for any of these species.

5.28 Wintering pochard show a strong preference for fresh water habitats, moving to coastal and inshore maritime habitats during periods of cold weather. Tufted duck tend to winter on lakes, reservoirs and tidal estuaries in western Europe, avoiding exposed marine habitats unless frozen out by hard weather. Goldeneye winter on a wide range of coastal and freshwater habitats in western Europe, feeding by diving to depths of 4 metres (all Snow and Perrins, 1998).

5.29 As with dabbling ducks, the Fleet provides favourable foraging habitat for the diving species discussed in paragraph 5.28. The deep waters of Portland Harbour do not

provide suitable foraging habitat that would be regularly used by any of these species.

5.30 Resident mute swan occur in a wide range of habitats including rivers, fresh water bodies, estuaries and coastal lagoons. Food (mainly aquatic vegetation) is obtained by upending in shallow water (less than 1m deep), or grazing and dabbling in terrestrial habitats (Snow and Perrins, 1998). The main herd associated with this site is centred on the swannery at Abbotsbury. The deep waters of Portland Harbour do not provide suitable foraging habitat that would be regularly used by mute swans.

5.31 There are no habitats within the application boundary that are considered functionally linked to any of the interest features of the Isle of Portland to Studland Cliffs SAC, Chesil and the Fleet SAC, Studland to Portland SAC or Crookhill Brick Pit SAC. The development is proposed within an operational port on previously developed land. No realistic impact pathway relating to the loss of functionally linked land has been identified for these sites.

Summary: No potential for LSE relating to loss or disturbance of habitats functionally linked to the Chesil Beach and the Fleet SPA/Ramsar around Portland Harbour during construction or operation of ERF. No impact pathways identified for remaining four sites.

Potential LSE - Emissions from the ERF during operation

5.32 As part of the design process Fichtner was commissioned to undertake an Air Quality Assessment (AQA) to evaluate the changes increasing stack height had on the deposition of various pollutants on the NSN sites. The assessment undertaken by Fichtner covered a range of pollutants that are known to have impacts on ecosystems above certain levels. The APIS website was consulted to determine the appropriate critical loads and levels for use in the assessment of likely significant effect. Fichtner used this information when undertaking the modelling work. The list of pollutants assessed and the critical levels used for the assessment are set out in table 1.

Pollutant	Concentration (µg/m^3)	Measured as
Nitrogen oxides (NOx) (as nitrogen dioxide (NO_2))	75	Daily mean
	30	Annual mean
Sulphur dioxide (SO_2)	10	Annual mean for sensitive lichen communities and bryophytes and ecosystems where lichens and bryophytes are an important part of the ecosystem's integrity
	20	Annual mean for all higher plants
Hydrogen fluoride	5	Daily mean
	0.5	Weekly mean
Ammonia (NH_3)	1	Annual mean for sensitive lichen communities and bryophytes and ecosystems where lichens and bryophytes are an important part of the ecosystem's integrity
	3	Annual mean for all higher plants

Table 1: Pollutants and relevant critical levels used for the ecological assessment.

5.33 In June 2019, the IAQM released the guidance document *A guide to the assessment of air quality impacts on designated nature conservation sites.* This was updated in May 2020 (the IAQM (2020) guidance). This guidance explains that the daily mean critical level of 75 µg/m^3 is appropriate where SO_2 and O_3 are at or above their critical

level, which is not the case in the UK. The IAQM consider it most appropriate to use 200 μg/m^3 as the short term critical level.

5.34 The IAQM (2020) guidance draws on the Environment Agency's (2016) *Air Emissions Risk Assessment for your Environmental Permit*, which states that to screen out impacts as insignificant at NSN and UK statutory designated sites:

- The long-term process contribution (PC) must be less than 1% of the long-term environmental standard (i.e. the critical level or load); and
- The short-term PC must be less than 10% of the short-term environmental standard

5.35 Critical levels and critical loads are the ambient concentrations and deposition fluxes below which significant harmful effects to sensitive ecosystems are unlikely to occur. Critical levels of air pollution and critical loads of pollutants have been identified by the United Nations Economic Commission for Europe (UNECE).

5.36 Critical loads are defined as: *"a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge"*.

5.37 Critical levels are defined as *"concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge".*

5.38 It is important to distinguish between the critical load and the critical level. The critical load relates to the quantity of pollutant deposited from air to the ground, whereas the critical level is the gaseous concentration of a pollutant in the air.

5.39 The Environment Agency's Operational Instruction 67-12 states that if the PC is less than 1% of the critical level and load then emissions from the application are not significant, and if the predicted environmental contribution (PEC) is less than 70% of the critical level and load it can be concluded 'no likely significant effect' (alone and in-combination).

5.40 AQTAG 17 - *Guidance on in combination assessments for aerial emissions from EPR permits* states that *"Where the maximum process contribution (PC) at the European* [NSN] *site(s) is less than the Stage 2 de-minimis threshold of the relevant critical level or load* [i.e. the criteria detailed in paragraph 5.32]*, the PC is considered to be inconsequential and there is no potential for an alone or in-combination effects with other plans and projects."*

5.41 The AQA modelled a range of stack heights due to the initial work identifying an exceedance of the 1% critical load threshold for nitrogen on part of Chesil and the Fleet SAC. The AQA modelling also identified an exceedance of 1% of the critical level for ammonia on part of the Isle of Portland to Studland Cliffs SAC. The final stack height (80m) was selected to ensure that the potential impacts of emissions on habitats and species within the NSN sites were minimised as far as practicable.

5.42 As noted in section 3 specific measures to reduce the impact on emissions on the NSN sites have been included as part of the project (increasing stack height). Therefore, this project includes mitigation and likely significant effects cannot be screened out, in line with the recent People Over Wind ruling.

5.43 Natural England (2018) guidance document *Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations* explains that it is widely accepted that imperceptible impacts are those which are less than 1% of the critical level or load, which is considered to be roughly

equivalent to 1,000 AADT for cars and 200 AADT for HGVs. This was based on the Design Manual for Roads and Bridges (DMRB) screening tool using Department for Transport data to calculate whether the NOx output could result in a change of more than 1% of the critical level/load.

5.44 Research produced by AQC has highlighted the need to also consider the ammonia released from vehicles when assessing the impact on nitrogen sensitive habitats (*Ammonia Emissions from Roads for Assessing Impacts on Nitrogen-sensitive Habitats,* AQC (2020). This is especially important for future years as reductions in NOx emissions have outpaced reductions in ammonia emissions. Both NOx and ammonia contribute to nitrogen deposition and the positive effect of reduced levels of NOx in exhaust gases (reducing nitrogen deposition) is offset for ecological receptors by the elevated levels of ammonia.

5.45 Natural England has advised the competent authority that air quality modelling should include ammonia emissions from traffic as set out in the AQC report. In line with the advice from Natural England, Fichtner has produced air quality modelling for traffic movements that includes emissions from ammonia.

5.46 The potential impact pathways related to changes in air quality associated with the project that could impact on the interest features of the NSN sites are:

- Increases in deposition of nitrogen affecting Annex 1 habitats within the following NSN: Isle of Portland to Studland Cliffs SAC and Chesil and the Fleet SAC
- Increases in deposition of nitrogen affecting the habitat of early gentian (Isle of Portland to Studland Cliffs SAC) and great crested newt (Crookhill Brick Pit SAC)
- Increases in nitrogen, NOx, SO_2 or NH_3 deposition on Studland to Portland SAC
- Increases in acid deposition affecting Annex 1 habitats within the following NSN: Isle of Portland to Studland Cliffs SAC and Chesil and the Fleet SAC
- Increases in the critical level of NH_3 affecting lower plants which form part of the species assemblage of certain Annex 1 habitats with the following NSN: Isle of Portland to Studland Cliffs SAC and Chesil and the Fleet SAC
- Increases in the critical level of NOx affecting plants which form part of the species assemblage of certain Annex 1 habitats with the following NSN: Isle of Portland to Studland Cliffs SAC and Chesil and the Fleet SAC
- Increases in deposition of nitrogen affecting habitat used by nesting little tern within the Chesil Beach and the Fleet SPA and Ramsar
- Increases in deposition of nitrogen affecting habitats used by wintering wigeon within the Chesil Beach and the Fleet SPA and Ramsar
- Increases in the critical level of NOx affecting habitats used by breeding little tern or wintering wigeon within the Chesil Beach and the Fleet SPA and Ramsar
- Emissions from traffic (vehicles and ships) associated with the development (both during construction and operation) affecting habitats or species within the following NSN: Isle of Portland to Studland Cliffs SAC, Chesil and the

Fleet SAC, Chesil Beach and the Fleet SPA and Ramsar and Crookhill Brick Pit SAC

Summary: Potential for LSE relating to changes in air quality during operation on interest features of Chesil Beach and the Fleet SPA and Ramsar, Chesil and the Fleet SAC, Crookhill Brick Pit SAC, Isle of Portland to Studland Cliffs SAC and Studland to Portland SAC.

6.0 Appropriate assessment

6.1 Paragraph 2.1 sets out the process of undertaking an appropriate assessment. The role of the appropriate assessment is to consider the implications of the plan or project for the conservation objectives of the NSN sites in question, and to determine whether they will have an adverse effect on the integrity of the site. In carrying out an appropriate assessment, a competent authority must have regard to the manner in which the project is proposed to be carried out, or to any conditions or restrictions subject to which it proposes that the consent, permission or other authorisation should be given.

6.2 The integrity of the designated site is defined as the "*coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was designated"* (MHCLG, 2019, *National Planning Practice Guidance: Appropriate Assessment* paragraph 003, reference ID: 65-003-20190722).

6.3 The information below looks at the potential impact pathways identified in section 5 in more detail, considering whether the project would have an adverse effect on the integrity of the designated sites. The first part of the assessment looks at the critical levels predicted for the project followed by the critical loads. After the air quality assessment other potential impact pathways are considered.

6.4 In line with national guidance, where the PC is below 1% of the relevant critical level or load and the background levels do not exceed the relevant critical load/level threshold set for the protection of vegetation, or lower plants (where relevant), it has been concluded that there will be no adverse effect on the integrity of the designated sites. These critical load and levels are recognised as thresholds below which harmful effects on sensitive UK habitats will not occur to a significant level according to current scientific understanding.

6.5 Road traffic emissions, and those generated by ships in scenarios which have deliveries from both road and sea, have been factored into the modelling work and the impact on the increases in nitrogen oxides, ammonia and nitrogen deposition as a result of the operation of the facility have been assessed in this section. The most conservative assumption of all deliveries by road is used for assessment purposes.

6.6 The DMRB considers any receptor within 200m of a road source to be potentially affected by that operation. Natural England (2018) states that it is widely accepted that imperceptible impacts are those which are less than 1% of the critical level or load, which is considered to be roughly equivalent to 1,000 AADT for cars and 200 AADT for HGVs.

6.7 The trip generation rate for the proposed development is well below the 200 HGV screening threshold, but the routing of traffic is along Main Road and Portland Beach Road which both run adjacent to designated ecological sites.

6.8 However, when combining the impacts from process and traffic emissions there is some exceedance of the relevant critical levels and loads for ammonia, oxides of nitrogen and nitrogen within two NSN sites. The highest levels of exceedance are found closest to the road edges. The modelling is conservative as it assumes that all deliveries are via road. In reality, it is likely that some deliveries will arrive by sea.

6.9 Where the 1% threshold of the relevant critical level/load is exceeded, further assessment of the potential impact on the integrity of the designated sites has been undertaken and the outcome of this assessment set out below. The initial stage of the assessment considers the impact of the project alone. When assessing the

impact of the proposed development alone, the contribution from process emissions from the ERF alongside related ship and road traffic emissions have been modelled.

Background levels from APIS

6.10 The APIS website includes mapped background concentrations of NOx and SO_2 on a 1km x 1km spatial resolution and NH_3, nitrogen deposition and acid deposition on a 5km x 5km spatial resolution, which is calculated as a rolling average three-year concentration. This is updated on a periodic basis. The latest update was published in March 2021 and has been updated to the three-year average for 2017 to 2019. The original shadow appropriate assessment used the data available at the time of submission, which was the three-year average from 2016 to 2018. An analysis of the differences has shown that the latest three-year average data is slightly greater than that used in the original shadow appropriate assessment. Therefore, this updated report uses the most recent available data.

Critical levels

Isle of Portland to Studland Cliffs SAC

6.11 As set out in Section 4 [Baseline], the SAC supports the following Annex 1 habitat types:

- Annual vegetation of drift line,
- Vegetated sea cliffs of the Atlantic and Baltic coasts; and
- Semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*)

6.12 The baseline concentration of NOx for the Isle of Portland to Studland Cliffs SAC, taken from the APIS website is between ~~17.6~~ 5.9 and ~~7.5~~ 35.33 µg/m^3, with the background NOx concentration being 10.19 µg/m^3 where the process contribution from the ERF is greater than 1% of the critical level.

6.13 The critical level for all vegetation types is 30µg/m^3 (annual mean). As noted above, the APIS website was updated in March 2021 and the most recent background levels are used in this assessment.

6.14 The air quality modelling of process emissions from the ERF undertaken by Fichtner shows that the maximum annual mean NOx PC from the ERF on the SAC is predicted to be 0.38 µg/m^3, which equates to 1.3% of the critical level for the SAC. The maximum NOx daily (24 hour) mean PC from the ERF is predicted to be 11.47 µg/m^3, which equates to 15.3% of the critical level of 75 µg/m^3 (or 5.7% of the critical level of 200 µg/m^3) for the SAC. The annual mean PC from the ERF combined with the background (the PEC) will be 10.57 µg/m^3, which is below the annual mean critical level of 30 µg/m^3 for the protection of vegetation and ecosystems. The NOx daily (24 hour) PEC is also below the daily mean critical level of 75 µg/m^3 set for the protection of vegetation and ecosystems at 21.66µg/m$^{3.}$.

6.15 The area of the SAC where the annual mean NOx PC is predicted to exceed 1% of the critical level is 5.19ha. This 1% contour encompasses the upper slopes around HMP The Verne. The area of the SAC where the daily mean NOx PC is predicted to exceed 10% of the 75 µg/m^3 critical level occurs in a similar area of the SAC and covers 5.67ha.

6.16 Additional dispersion modelling of road traffic exhaust emissions associated with the operation of the proposed development has been carried out to support the ES addendum (appendix 3.1 the ES addendum). This presents the combined impact of

process emissions from the ERF and road traffic associated with the proposed development. As shown on figure 23 of appendix 3.1 of the ES addendum, the total contribution of NOx from the proposed development is less than 1% of the critical level within about 13m of the road.

6.17 The area where the contribution of NOx (with development road traffic added) exceeds 1% of the critical level is largely outside of the SAC boundary. Figure 2 shows the alignment of the port roads in relation to the SAC boundary. As is clearly demonstrated, the vast majority of the SAC boundary is over 12m from the road edge. The total concentration of NOx from process emissions and road traffic will be at c1% of the relevant critical level at the boundary with the SAC.

6.18 The area where the peak impact of process emissions occurs is over 350m from the road. Therefore, the additional contribution from road traffic associated with the proposed development in the area where the process contribution is greater than 1% of the critical level would be minimal.

6.19 APIS shows that background levels of NOx around the Port already exceed the relevant critical level, although across the wider SAC the background levels of NOx are below 70% of the long-term environmental standard for annual mean NOx. The very localised nature of the high concentrations of NOx around the Port means that concentrations of NOx to the south of the Port across the SAC are likely to be much lower than the grid average suggests. No adverse impacts on the integrity of the site from increased levels of NOx within the Isle of Portland to Studland Cliffs SAC are predicted as a result of combined impact of process emissions and traffic associated with the proposed development.

6.20 The critical level for SO_2 for the protection of lichens and bryophytes is 10 $\mu g/m^3$ (annual mean). The APIS background concentration for SO_2 at the SAC is between 0.4 and 2.28 $\mu g/m^3$, with the background SO_2 concentration being 0.72 $\mu g/m^3$ at the point of maximum impact of process emissions from the ERF in the SAC.

6.21 The air quality modelling of process emissions from the ERF undertaken by Fichtner shows that the annual mean SO_2 PC is 0.09 $\mu g/m^3$, 0.9% of the critical level for the SAC. The annual mean PC for SO_2 combined with the background level is well below the annual mean critical level of 10 $\mu g/m^3$ (8.1% of the critical level) for the protection of lichens and bryophytes with the ERF in operation. Road vehicle exhaust emissions are not a significant source of SO_2; as such, the impact of SO_2 will purely be driven by emissions from the ERF. No adverse impacts on the integrity of the site from increased levels of SO_2 within the Isle of Portland to Studland Cliffs SAC are predicted as a result of the development.

6.22 The critical level for NH_3 set for the protection of lichens and bryophytes is 1 $\mu g/m^3$ (annual mean). The APIS background concentration for NH_3 across the Isle of Portland to Studland Cliffs SAC is between 0.51 and 2.24 $\mu g/m^3$, with the background concentration being 0.71 $\mu g/m^3$ where the process contribution from the ERF is greater than 1% of the critical level. The air quality modelling of process emissions from the ERF undertaken by Fichtner shows that the maximum annual mean NH_3 PC from the ERF across the SAC is 0.025 $\mu g/m^3$, 2.5% of the critical level for the SAC. The annual mean PC for NH_3 at the point of maximum impact combined with the background level is below the annual mean critical level of 1 $\mu g/m^3$ (being 73.5% of the critical level) for the protection of lichens and bryophytes.

6.23 The area affected by the increase in the critical level of ammonia covers 38.44ha of the SAC. The equates to c2.6% of the total SAC area (1447.5ha). The Magic website classifies the areas within this zone as maritime cliffs and slopes (the Annex I habitat vegetated sea cliffs of the Atlantic and Baltic Coasts) or calcareous grassland (the

Annex I habitat semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*)). The calcareous grassland has the potential to support the Annex II species early gentian. The supplementary advice to the conservation objectives identifies the lichen and bryophyte community as typical species of the calcareous grassland communities. The critical levels for NH_3 and SO_2 used in this assessment are those set through APIS for sites with lower plant interest.

6.24 As discussed above, additional dispersion modelling of road traffic exhaust emissions associated with the operation of the proposed development is provided in appendix 3.1 of the ES addendum. This presents the combined impact of process emissions from the ERF and road traffic associated with the proposed development. Figure 28 shows that ammonia emissions from the proposed development will exceed 1% of the critical level for the whole 200m transect. The area with the peak impact of process emissions occurs over 350m from the road. Therefore, the additional contribution from road traffic associated with the proposed development at the point of maximum impact from process emissions from the ERF would be minimal.

6.25 Where the PC from the ERF is greater than 1% of the critical level for lichen sensitive communities (close to Castle Road where there is an additional contribution from road traffic), the Magic website classifies the areas within this zone as maritime cliffs and slopes (the Annex 1 habitat vegetated sea cliffs of the Atlantic and Baltic Coasts).

6.26 Where the PC from the ERF is greater than 1% of the critical level for lichen sensitive communities away from the road near to HMP The Verne, there would not be a significant additional contribution from road traffic as this is over 200m from the roads.

6.27 Although the mean annual PC exceeds 1% of the critical level threshold for NH_3, as shown on figure 26 of appendix 3.1 of the ES addendum, the overall PEC on the site would remain below the long-term critical level with the ERF in operation. At the point of maximum impact of process emissions, the overall PEC would be less than the critical level. No adverse impacts on the integrity of the site from increased levels of NH_3 within the Isle of Portland to Studland Cliffs SAC are predicted as a result of operation of the proposed development.

6.28 The information given on APIS for annual vegetation of drift lines states that this habitat is not sensitive to NH_3, NOx or SO_2. Therefore, no adverse impacts on the integrity of this Annex I habitat are predicted as a result of the operation of the proposed development, because this habitat is not considered to be sensitive to changes in air quality.

6.29 The information given on APIS for vegetated seas cliffs of the Atlantic and Baltic Coasts recommends site specific advice should be sought. The lowest critical level set for the protection of lichens and bryophytes has been set for this site. It also recommends that site specific advice is sought for SO_2, setting a critical level of 10-20 $\mu g/m^3$ (set for all vegetation). The assessment of impacts on this site uses the lower end of this range. NOx levels for vegetated seas cliffs of the Atlantic and Baltic Coasts are the same as those set for semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*).

6.30 This assessment has concluded that there would be no adverse impact on the integrity of the site for all pollutants based on the most stringent critical levels. For all pollutants (NH_3, SO_2 and NOx), APIS identifies semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) as the most

sensitive habitat within the SAC. It follows therefore that a conclusion of no adverse impacts on the integrity of the most sensitive habitat will allow the same conclusion to be reached for areas of vegetated seas cliffs of the Atlantic and Baltic Coasts within the SAC.

Chesil and the Fleet SAC

6.31 As set out in Section 4 (Baseline), the SAC supports the following Annex 1 habitat types:

- Annual vegetation of drift lines;
- Perennial vegetation of stony banks;
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*);
- Coastal lagoons; and
- Mediterranean and thermo-Atlantic halophilous scrubs.

6.32 The APIS background NOx concentration for the SAC is between 4.68 and 19.17 $\mu g/m^3$, with the background NOx concentration being 10.36 $\mu g/m^3$ where the process contribution from the ERF is greater than 1% of the critical level. The critical level for all vegetation types is 30 $\mu g/m^3$ (annual mean).

6.33 The air quality modelling of process emissions from the ERF undertaken by Fichtner (Appendix D2 of the ES) shows that the maximum annual mean NOx PC from the ERF is predicted to be 0.16 $\mu g/m^3$, which equates to 0.5% of the critical level for the SAC. The maximum NOx daily (24 hour) mean PC from the ERF is predicted to be 4.02 $\mu g/m^3$ (which equates to 5.4% of the critical level of 75 $\mu g/m^3$ or 2.0% of the critical level of 200 $\mu g/m^3$) for the SAC. The annual mean PC from the ERF combined with the background (the PEC) will be 10.52 $\mu g/m^3$, which is below the annual mean critical level of 30 $\mu g/m^3$ for the protection of vegetation and ecosystems. The NOx daily (24 hour) PEC is also below the daily mean critical level set for the protection of vegetation and ecosystems.

6.34 As the maximum annual and daily mean PC is below 1% and 10% of the relevant critical levels for NOx, the impact can be screened out as insignificant and no adverse impacts on the integrity of the site from increased levels of NOx within Chesil and the Fleet SAC are predicted as a result of the emissions from the ERF.

6.35 The additional dispersion modelling of road traffic exhaust emissions associated with the operation of the proposed development in appendix 3.1 of the ES addendum presents the combined impact of process emissions from the ERF and road traffic associated with the proposed development. The air quality modelling shows that alone the impact of the development (traffic and emissions from the plant) is negligible, with NOx critical levels only exceeding 1% of the relevant critical level within 2m of the edge of the carriageway (A354 Portland Beach Road).

6.36 A footpath runs along the length of the western side of Portland Beach Road. The footpath is over 2m wide (see photo 1 in Appendix 3). The area where NOx contributions exceed 1% of the critical level on the western side of the road is not within the SAC. On the eastern side the area affected is outside the SAC (falling within the zone between Osprey Quay and the road edge).

6.37 Areas of affected Annex 1 habitat occur around the two roundabouts on the A354 (see figures 3 and 4). At the northern end (Hamm Beach Road roundabout) the 0.0004ha of MC5 grassland and 0.004ha of SD1 mixed Sonchus community fall within the 1% contour. Photo 1 shows the SD1 mixed Sonchus community. At the

southern roundabout 0.32ha of SD1b Arrhenatherum SD1 community falls within the 1% contour (see photos 2 and 3 in Appendix 3).

6.38 The APIS background concentration for SO_2 on the SAC is between 0.4 and 0.92 µg/m^3, with the background SO_2 concentration being 0.74 µg/m^3 at the point of maximum impact of process emissions from the ERF. The critical level for SO_2 for the protection of lichens and bryophytes is 10 µg/m^3 (annual mean).

6.39 The air quality modelling undertaken by Fichtner shows that the annual mean SO_2 PC is 0.09 µg/m^3, 0.5% of the critical level for the SAC. The annual mean PC for SO_2 combined with the background level is well below the annual mean critical level of 10-20 µg/m^3 set for the protection of all vegetation with the ERF in operation. Road vehicle exhaust emissions are not a significant source of SO_2; as such, the impact of SO_2 will purely be driven by emissions from the ERF. No adverse impacts on the integrity of the site from increased levels of SO_2 within Chesil and the Fleet SAC are predicted as a result of the proposed development.

6.40 APIS states that the lichens and bryophytes are not present in the qualifying features of the SAC. Therefore, the appropriate annual mean critical level is 3 µg/m^3. Information provided by DERC has confirmed the lack of significant areas of lichens and bryophytes in this part of the SAC (Edwards, 2021). These pioneer shingle communities do not support significant lower plant communities (see paragraph 6.85). Figures 3 and 4 show the distribution of NVC communities along the A354 in the affected area.

6.41 The APIS background concentration for NH_3 on the SAC is between 0.71 and 2.07 µg/m^3, with the background concentration being 0.71 µg/m^3 at the point of maximum impact of process emissions from the ERF in the SAC. The air quality modelling of process emissions from the ERF undertaken by Fichtner shows that the maximum annual mean NH_3 PC from the ERF across the SAC is 0.01 µg/m^3, 0.4% of the critical level for the SAC. The annual mean PC for NH_3 at the point of maximum impact combined with the background level is below the annual mean critical level of 3 µg/m^3 (being 24.0% of the critical level).

6.42 The additional dispersion modelling of road traffic exhaust emissions associated with the operation of the proposed development in appendix 3.1 of the ES addendum presents the combined impact of process emissions from the ERF and road traffic associated with the proposed development. As shown on figure 12 of appendix 3.1 to the ES addendum, the total contribution of NH_3 from the proposed development is less than 1% of the critical level within about a metre of the A354 Portland Beach Road. Given the presence of a 2 metre wide footpath on the western side of the A354, the modelled exceedance would not occur within the SAC.

6.43 As a sensitivity test, the air quality modelling also considered the potential impacts for the annual mean PC for NH_3 on the SAC, using an annual mean critical level of 1 µg/m^3 set for the protection of lichens and bryophytes. This modelling has shown that there is some exceedance above 1% of this critical level in part of the SAC (5.14ha of the SAC).

6.44 Although the mean annual PC would exceed the relevant 1% critical level threshold for NH_3 at 1 µg/m^3, the overall PEC on the site would remain below 100% of the long-term environmental standard with the ERF in operation (the PEC would be 72% of the critical level for NH_3 at 1 µg/m^3). Pioneer shingle communities do not support important lichen or bryophyte communities (see paragraph 6.85). Therefore, no adverse impacts on the integrity of the site from increased ammonia levels (at critical levels set at 1 µg/m^3 and 3 µg/m^3) within Chesil Beach and the Fleet SAC are predicted as a result of the proposed development.

6.45 The information given on APIS for annual vegetation of drift lines states that this habitat is not sensitive to NH_3, NOx and SO_2. No adverse impacts on the integrity of this Annex I habitat are predicted as a result of the operation of the proposed development, as this habitat is not considered to be sensitive to changes in air quality.

6.46 The information given on APIS for Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) states that site specific advice should be sought for the NH_3 critical level. It also states that site specific advice should be sought for NOx critical levels, but standard NOx critical levels are given on the website. It is a similar situation for SO_2, where the recommendation is site specific advice is sought, but a 10-20 $\mu g/m^3$ critical level range is given.

6.47 This Annex I habitat does not occur within the area of the SAC where there is a potential that the combined impact of emissions from the ERF and the road traffic would exceed 1% of the critical levels set for the most sensitive habitat (vegetated shingle of stony banks). Figures 3 and 4 show the distribution of habitats along the A354. No adverse impacts on the integrity of this Annex I habitat are predicted as a result of the operation of the proposed development.

6.48 The information given on APIS for coastal lagoons (a priority habitat) states that site specific advice should be sought for the NH_3 critical level. It also states that site specific advice should be sought for NOx critical levels, but standard NOx critical levels are given on the website. It is a similar situation for SO_2, where the recommendation is site specific advice is sought but a 10-20 $\mu g/m^3$ critical level range is given.

6.49 This Annex 1 habitat does not occur within the area of the SAC (<1m from the road edge) where there is the potential that the combined impact of emissions from the ERF and the road traffic would exceed 1% of the critical levels set for the most sensitive habitat (vegetated shingle of stony banks). Figures 3 and 4 show the distribution of habitats along the A354. No adverse impacts on the integrity of this Annex I habitat are predicted as a result of the proposed development, as this habitat is not present within the zone of impact and is not considered to be sensitive to changes in air quality.

6.50 The information given on APIS for Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruitcosi*) states that site specific advice should be sought for the NH_3 critical level. It also states that site specific advice should be sought for NOx critical levels, but standard NOx critical levels are given on the website. It is a similar situation for SO_2, where the recommendation is site specific advice is sought but a 10-20 $\mu g/m^3$ critical level range is given.

6.51 This Annex 1 habitat does not occur within the area of the SAC (<1m from the road edge) where there is the potential that the combined impact of emissions from the ERF and the road traffic would exceed 1% of the critical levels set for the most sensitive habitat (vegetated shingle of stony banks). Figures 3 and 4 show the distribution of habitats along the A354. No adverse impacts on the integrity of this Annex I habitat are predicted as a result of the proposed development, as this habitat is not present within the zone of impact and is not considered to be sensitive to changes in air quality.

Chesil Beach and the Fleet SPA/Ramsar

6.52 The boundaries for Chesil Beach and the Fleet SPA/Ramsar are over 1km north west of the zone of impact discussed for Chesil and the Fleet SAC. The air quality modelling for the SAC represents an over-estimation of the worst-case deposition scenario for the SPA/Ramsar site and the impacts will be significantly lower than that for the SAC.

6.53 As demonstrated for the SAC, the mean annual and daily PC is below 1% and 10% of the relevant critical levels for NOx within about a metre of the A354 Portland Beach Road. No adverse impacts on the integrity of the site from increased levels of NOx within Chesil Beach and the Fleet SPA/Ramsar are predicted as a result of the proposed development alone.

6.54 As demonstrated for the SAC, the annual mean PC for SO_2 combined with the background level is below the annual mean critical level of 10-20 μg/m^3 set for the protection of all vegetation with the development in operation. No adverse impacts on the integrity of the site from increased levels of SO_2 within Chesil Beach and the Fleet SPA/Ramsar are predicted as a result of the development alone.

6.55 As demonstrated for the SAC, the annual mean NH_3 PC is 0.01 μg/m^3, 0.4% of the critical level for the SAC. The annual mean PC for NH_3 from the ERF and traffic combined with the background level is below the annual mean critical level of 3 μg/m^3 (as given on APIS and used in the air quality assessment) for the protection of vegetation with the development in operation within about a metre of the A354 Portland Beach Road. No adverse impacts on the integrity of the site from increased levels of NH_3 within Chesil Beach and the Fleet SPA/Ramsar are predicted as a result of the proposed development alone.

6.56 Given the distance of the SPA/Ramsar from the proposed development, and the fact that no adverse impacts on sensitive habitats (shingle communities) are predicted within the SAC, which lies much closer to the development, no changes in the vegetation composition and structure within the SPA/Ramsar are anticipated. The breeding habitat of little tern (bare shingle and sandy substrates) and the feeding areas of wintering wigeon (saltmarsh, grassland and mudflats) will be unaffected by changes in air quality associated with the proposed ERF alone.

Critical loads

Isle of Portland to Studland Cliffs SAC

6.57 The APIS website only provides critical loads for the Annex 1 habitat semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) and early gentian. The critical load given for both is 15-25kg/N/ha/yr. Although APIS identifies the Annex 1 habitat vegetated sea cliffs of the Atlantic and Baltic Coasts as being sensitive to nitrogen, no specific critical load has been set. The Annex 1 habitat annual vegetation of drift lines is not considered to be sensitive to nitrogen.

6.58 Across the SAC the rate of nitrogen deposition stated on APIS varies between 7.5 and 17.6kg/N/ha/yr. The area of highest nitrogen deposition occurs on the stretch of coast between Ringstead Bay and Durdle Door, beyond the predicted zone of impact for this facility. Apart from along the coast east of Weymouth, the baseline rate of nitrogen deposition does not exceed the lower limit of the critical loads given for any of the interest features of the SAC. At the point of maximum impact of process emissions from the ERF within the SAC the background level for calcareous grassland is 8.48kg/N/ha/yr.

6.59 The air quality modelling of process emissions from the ERF undertaken by Fichtner (Appendix D2 of the ES) shows a maximum rate of nitrogen deposition (PC) within the SAC of 0.169kg/N/ha/yr. This represents 1.1% of the lower end of the critical load given for all habitats and species within the SAC. The background level of nitrogen deposition in the area of the SAC closest to the proposed development is 8.48kg/N/ha/yr. The area of the SAC falling within the 1% contour totals 13.13ha, covering the upper slopes around HMP The Verne.

6.60 The predicted contribution of nitrogen to the Annex 1 habitats within the SAC is above 1% of the lower end of the critical load for semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) and early gentian. The zone of impact covers parts of SSSI units 33, 34, 51 and 52.

6.61 The Magic website classifies the area within SSSI unit 33 as the maritime cliffs and slopes, attributable to the Annex 1 habitat vegetated sea cliffs of the Atlantic and Baltic Coasts with small areas of woodland. The habitat vegetated sea cliffs of the Atlantic and Baltic Coasts is found around the whole of the coastline of the Isle of Portland. The majority of SSSI units 34, 51 and 52 are classified as lowland calcareous grassland (semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*)) with small areas of maritime cliffs and slopes habitat.

6.62 It is considered likely that areas of unit 33 have previously supported more extensive areas of calcareous grassland (small areas of CG3 grassland are still present) and that lack of management has probably contributed to a reduction in the area of grassland through scrub encroachment. An unpublished study by DERC (Edwards, 2016) demonstrates that in the 1950's much of Unit 33 was scattered scrub or open habitat, by 1972 much of the eastern half of the unit had developed into dense scrub and by 1997 the whole unit was classified as dense scrub. Photos 4 and 5 show the extent of scrub cover across the unit.

6.63 Natural England has confirmed that scrub encroachment is a threat to the mosaic of grassland and scrub habitats present along the Weares and undercliffs. For Unit 33 to achieve favourable conservation status, Natural England has confirmed the unit would be a mosaic of calcareous grassland (preferably grazed) and maritime scrub communities.

6.64 A precautionary approach to the assessment has been adopted, as the Annex 1 habitat semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) is present within unit 33 and restoration of a grassland/scrub mosaic is a management objective. The assessment uses the critical load for semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) and the assessment criteria that deposition levels should not be at a level that would prevent this habitat re-establishing in the future should management regimes change. This would be consistent with a 'restore' objective within the conservation objectives for the site; a 'maintain' objective would apply to areas of existing calcareous grassland.

6.65 The 2016 DERC report recommended clearance of sycamore trees and saplings in Unit 33 to create glades to provide edge habitat. It also recommended clearance of cotoneaster (*C simonsii*) from the steep slope below HMP The Verne.

6.66 Unit 33 is currently considered to be in unfavourable declining condition due to a lack of grazing and insufficient scrub control. The nitrogen additions associated with the proposal alone, combined with background levels, will be below the lower end of the critical loads given for the Annex 1 habitat semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*). The proposed development is

not considered to affect the ability to achieve favourable conservation status for the site. The key element to restoring this area to favourable conservation status relates to scrub clearance and control and the implementation of a suitable grazing regime.

6.67 The level of nitrogen deposition from the proposed development and background sources (PEC) is below the lower end of the critical load identified as being the threshold where impacts on the Annex I habitat are predicted to occur based on current ecological understanding. This would mean that, were unit 33 of the SSSI managed to restore the area to favourable condition by removing scrub and introducing grazing, the deposition of nitrogen would not prevent the Annex I habitat (semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*)) from achieving favourable conservation status.

6.68 The supplementary advice for the conservation objectives notes that the critical loads for the Annex 1 habitat semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) are currently within acceptable limits, although there are concerns about impacts of future increases in deposition levels on the feature. The supplementary advice for the conservation objectives covering early gentian highlight that the supporting habitat for this species (calcareous grassland) is sensitive to changes in air quality.

6.69 As the PEC will be below 70% of the long-term environmental standard for the Annex I habitat semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*) with the ERF operational and traffic, no adverse impacts on the integrity of the site from increased nitrogen deposition within the Isle of Portland to Studland Cliffs SAC are predicted as a result of the proposed development.

6.70 The highest predicted contribution of acid deposition to the Annex 1 habitats within the SAC is 1.0% of the critical load function for semi-natural dry grassland and scrubland facies on calcareous substrates (*Festuco-Brometalia*). However, when the background is included, the PEC will be well below 70% of the long-term critical load for this Annex 1 habitat (3.8%) with the ERF operational and traffic, and no adverse impacts on the integrity of the site from acid deposition within the Isle of Portland to Studland Cliffs SAC are predicted as a result of the development.

6.71 The APIS website states that the Annex I habitat annual vegetation of drift lines is not sensitive to eutrophication but no critical load for this habitat is given. The very small increases in nitrogen deposition modelled to occur as a result of the proposed ERF would only occur along a very short length of the coast where this habitat may form. Given this Annex 1 habitat is not considered to be sensitive to nitrogen deposition, no adverse impacts on the integrity of the site from increased nitrogen deposition within the Isle of Portland to Studland Cliffs SAC are predicted as a result of the development.

6.72 The APIS website states that the Annex I habitat vegetated sea cliffs of the Atlantic and Baltic Coasts is not sensitive to nitrogen and no critical load for this habitat is given, as this habitat covers a wide range of habitat types from wetlands to woodland. Given this Annex I habitat is not considered to be sensitive to nitrogen deposition, no adverse impacts on the integrity of the site from increased nitrogen deposition within the Isle of Portland to Studland Cliffs SAC are predicted as a result of the development.

Chesil and the Fleet SAC

6.73 The APIS website provides critical loads for four of the five Annex I habitats within the SAC. Perennial vegetation of stony banks is the most sensitive habitat to nitrogen, with a critical load of 8-15kg/N/ha/yr. The Annex I habitats coastal lagoons,

Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) and Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*) all have a critical load of 20-30kg/N/ha/yr. The Annex I habitat annual vegetation of drift lines is not considered to be sensitive to nitrogen.

6.74 The APIS background dataset shows that deposition varies across the SAC between 8.5 and 16.4kg/N/ha/yr. This baseline rate of deposition exceeds the lower limit of the critical load given for perennial vegetation of stony banks; the lower limit of the critical load is not exceeded for any of the other Annex I habitats within the SAC. At the point of maximum impact of process emissions from the ERF within the SAC the background level is 8.48kg/N/ha/yr.

6.75 The air quality modelling of process emissions from the ERF undertaken by Fichtner (appendix D2 of the ES) shows a maximum rate of nitrogen deposition (PC) within the SAC of 0.073kg/N/ha/yr. This represents 0.9% of the lower end of the critical load given for the Annex I habitat perennial vegetation of stony banks within the SAC.

6.76 The additional dispersion modelling of road traffic exhaust emissions associated with the operation of the proposed development in appendix 3.1 of the ES addendum presents the combined impact of process emissions from the ERF and road traffic associated with the proposed development. As shown on figure 16 of appendix 3.1, the total contribution of nitrogen deposition from the proposed development remains above 1% of the critical load for a distance of about 100 m from the A354 Portland Beach Road.

6.77 The air quality modelling shows that alone the impact of the development (traffic and emissions from the plant) will result in nitrogen deposition rates of below 2kg/N/ha/yr within 4m of the edge of the carriageway. The greatest source of nitrogen deposition is ammonia from road traffic emissions. As highlighted in paragraph 6.36, a footway runs along the western side of the A354, so the first 2m where nitrogen deposition will be highest is outside of the SAC.

6.78 The Annex 1 habitat perennial vegetation of stony banks within the SAC is already experiencing levels of nitrogen deposition above the minimum deposition rate identified for this habitat. Excessive nitrogen deposition is considered to lead to increases in tall grasses, a decrease in prostrate plants, increased nitrogen leaching, soil acidification and the loss of typical lichen species. However, this is a variable community and there are different successional stages with similarities to grassland and heathland communities.

6.79 Two critical loads are provided by APIS for coastal vegetated shingle, depending on the substrate. Communities on acid substrates have a lower critical load of 8kg/N/ha/yr, while those communities that occur on calcareous substrates are attributed a critical load of 10kg/N/ha/yr.

6.80 The geological conservation review published by JNCC examines the history of the formation of Chesil Beach, which gives an indication of the type of substrate in this part of the SAC (May, 1980-2007). Chesil Beach is noted for the systematic longshore size-grading of beach material, with the largest shingle cobbles (clasts) occurring at the eastern end of the beach (with a mean long-axis of 50mm). The ridge height also increases from west to east with a maximum height of c14m above mean sea level at Chesilton.

6.81 Around 98% of the material that forms Chesil Beach is flint or chert. Chert is a sedimentary rock composed of the mineral form of silicon dioxide. Limestone pebbles originating from the local Portland and Purbeck stone formations are present in the shingle at Chiswell. Although there is the possibility that sand or other calcareous

material exists with the shingle structure, it is considered unlikely given the size of the shingle pebbles at this end of the beach, which will have sizable internal voids between each shingle pebble. Fine substrates with a higher pH are likely to occur on the lee side of Chesil Beach. The formation of Chesil Beach is primarily from material from West Devon.

6.82 The JNCC undertook a nationwide survey of coastal vegetated shingle structures in 1993 (Sneddon and Randall, 1993). This survey covered a significant proportion of Chesil Beach, although not the area where nitrogen deposition is modelled to be over 1% of the critical load for this habitat. The information in the report provides useful background on the types of shingle plant communities that are likely to be present on this part of the SAC. This study also provided a more detailed set of descriptions for shingle vegetation communities than are presented in Rodwell (2000).

6.83 The report highlights that along Chesil Beach most of the vegetation communities form on the lee side of the storm crest. The plant community highlighted as being most prevalent at the eastern end of Chesil Beach is the SH7 community, which typically has only 30% plant cover in each quadrat and three species per quadrat on average (size). It is an extremely depauperate community dominated by sea campion (*Silene uniflora*) with only infrequent maritime herb associates such as yellow horned poppy (*Glaucium flavum*), field bindweed (*Convolvulus arvensis*), prickly sow-thistle (*Sonchus asper*) and orache (*Atriplex* species). The other community likely to be present is the SH3 community. This is another species-poor assemblage and is even more open than the SH7 community with around 95% bare shingle in each quadrat. Sea campion and curled dock (*Rumex crispus littoreus*) are the two constants that dominate the community. The most common associates are Danish scurveygrass (*Cochlearia danica*) and herb-robert (*Geranium robertianum*) although neither occurs in large amounts. This community occurs along much of the length of Chesil Beach.

6.84 Both these communities are identified as having affinities to the SD1 community described by Rodwell (2000), although neither is a close match, primarily due to the paucity of yellow horned poppy in both these communities on Chesil Beach. Rodwell notes that the fine gravel beaches tend to support the richer and denser stands of the SD1 community, particularly where there is some sand or comminuted organic detritus mixed in. It is possible that the presence of finer fractions of gravels is necessary for many shingle plants to develop an extensive network of absorptive roots needed to thrive. This may explain the very low abundance of plants recorded in the SH3 and SH7 communities identified in the JNCC survey which occur on very coarse shingles.

6.85 Rodwell notes that decaying wrack or other strandline detritus provides an opportunity of more nitrophilous plants such as spear-leaved orache (*Atriplex prostrata*), sea beet (*Beta vulgaris*) and sow-thistle species. However, the organic content of the substrate of the SD1 community is slight and there is never any development of an integrated soil profile, even in more stable stands. There are no mosses, lichens or liverworts associated with these communities.

6.86 In 2018 Footprint Ecology was commissioned by Natural England to update work by Groome and Crowther (2005) mapping Annex 1 habitat within the NSN site (Lake *et al*, 2019). This work divided the perennial vegetation of stony banks into two categories: pioneer shingle communities (represented by eight variants of the NVC SD1 community) and shingle grasslands (largely variants of MC5 and MC8 grasslands). The report notes that most of the vegetated areas of the beach include a varying amount of sand within the shingle matrix. The results of the 2018 survey are shown on figures 3 and 4.

6.87 The EU interpretation manual identifies the NVC communities SD1 community as the community characteristic of the Annex 1 habitat type perennial vegetation of stony banks. The manual attributes the MC5 and MC8 maritime grassland communities to the Annex 1 habitat vegetated sea cliffs of the Atlantic and Baltic Coasts. Vegetated sea cliffs of the Atlantic and Baltic Coasts are not an interest feature of Chesil and the Fleet SAC. This distinction is relevant to the assessment process as the critical loads for the habitats differ, with critical loads for maritime grasslands higher than the critical load for perennial vegetation of stony banks.

6.88 The 2018 survey found that the SD1 communities within the site have declined by between 38-84% since 2005; the overall extent of the losses of SD1 sub-communities is shown in table 2. The loss of the pioneer shingle communities is attributed to recreational activities and where there are accumulations of anthropogenic litter.

NVC code	Sub-community description	Area in 2005	Area in 2018	% decline
SD1a	*Crambe maritima*	9.7	9.7	0%
SD1a	*Crithmum maritimum*	0.6	0.2	66%
SD1b	*Lathyrus japonicus*	7.3	3.9	47%
SD1b	*Arrhenatherum elatius*	2.9	1.3	55%
SD1	*Silene uniflora*	54.3	23.6 49 (if bare shingle included)	57% (10%)
SD1	*Geranium robertianum*	6.2	1	84%
SD1	Mixed *Sonchus arvensis*	2.9	1.8	38%
SD1-SD10	Pioneer shingle stands of *Carex arenaria*	0.04	-	100%

Table 2: Extent of vegetated shingle pioneer communities within Chesil and the Fleet SAC (from Lake *et al,* 2019)

6.89 Table 3 shows the results of the NVC survey covering the shingle grasslands that fall within the Annex 1 habitat vegetated shingle of stony banks within Chesil and the Fleet SAC.

NVC code	Sub-community description	Area in 2005	Area in 2018	Area increase/ decline
MC5	*Sea mouse-ear shingle grassland*	7.3	9.5	+2.2
MC8a	*Sea pink shingle grassland - typical sub-community*	2.2	1.8	-0.4
MC8d	*Sea pink shingle grassland - Yorkshire fog sub-community*	0.3	0	-0.3
MC8f	*Sea pink shingle grassland - kidney vetch sub-community*	1.0	1.0	-
MC9b	*Yorkshire fog cliff grassland - cock's-foot sub-community*	0	1.0	+1.0
MC11b	*Wild carrot shingle grassland – sand sedge sub-community*	0.6	2.3	+1.7
SD1-MC5/MC8	*Horned poppy shingle strandline/shingle grassland* (transition)	0.5	1.4	+0.9

Table 3: Extent of vegetated shingle (shingle grassland) communities within Chesil and the Fleet SAC (from Lake *et al,* 2019)

6.90 The report notes that overall the extent of shingle vegetation within the site is remarkably stable and the apparent decline in the estimated cover of pioneer vegetation (table 2) is thought to be due to differences in recording areas of bare shingle between the 2005 and 2018 surveys. The report concludes that overall the

area of shingle grassland on Chesil Beach remains constant (table 3), although the areas recorded in 2018 represent an increase of 5.1ha of this habitat compared to the 2005 survey.

6.91 The Footprint Ecology report identifies the SD1 vegetation community Mixed *Sonchus arvensis* as occurring within the area of deposition above 1%. There is also a stand of the SD1 community *Arrhenatherum elatius* within the zone of impact. The report notes that one of the stands of Mixed *Sonchus arvensis* appears to have developed since 2005, indicating that baseline conditions remain suitable for the development of Annex I habitat in this area.

6.92 This habitat has formed at the base of the lee side of the shingle bar alongside the A354, an area where the finer gravels and other sediments have accumulated (as described in Rodwell, see paragraph 6.84), allowing the richer and denser stands of the SD1 community to form. The Footprint Ecology report notes this community is usually found where the shingle has been disturbed and/or where there is finer grained material present. It is present in unit 1 of the SSSI near Portland and towards Bridport, usually close to the landward margins.

6.93 Along the roadside various SD1 communities are present, with sea campion and rock samphire established or establishing on loose shingle within metres of the road (see photos 6 and 7). Photos 8, 9, 10 and 11 show the SD1 mixed *Sonchus* and SD1 *Arrhenatherum* communities alongside the A354 in the area shown on figures 3 and 4.

6.94 The supplementary advice on conservation objectives for the Annex I habitat perennial vegetation of stony banks (updated 13/3/20) sets a target to restore concentrations and deposition of air pollutants to below site-relevant critical load and level values given for this feature on APIS. The supporting notes include a site-relevant critical load for this Annex 1 habitat of 8-15kg/N/ha/yr, going on to note that, with a maximum deposition of 16.1kg/N/ha/yr, nitrogen deposition exceeds the site relevant critical load for ecosystem protection and hence there is a risk of harmful effects.

6.95 Information on APIS shows that the level of nitrogen deposition on this part of the SAC is far lower than occurs on other parts. The background level of nitrogen deposition on this part of the SAC between 2018 and 2020 was 8.4kg/N/ha/yr (367826, 74236), an exceedance of the lower end of the critical load for this habitat of 0.4kg/N/ha/yr.

6.96 The Footprint Ecology report lists the key plant species recorded in the SD1 mixed *Sonchus* community, which usually has a high cover of non-maritime species, many of which are short-lived perennials and ruderal species including perennial sow-thistle (*Sonchus arvensis*), bittersweet (*Solanum dulcamara*), bristly ox-tongue (*Picris echioides*), common mallow (*Malva sylvestris*), field bindweed and sea mayweed (*Tripleurospermum maritimum*). Other species present include wild parsnip (*Pastinaca sativa*), wild carrot (*Daucus carota*), sea beet, creeping cinquefoil (*Potentilla reptans*), hedge bindweed (*Calystegia sepium*) and creeping buttercup (*Ranunculus repens*) and, less commonly, smooth sow-thistle (*Sonchus oleraceus*), ribwort plantain (*Plantago lanceolata*), Oxford ragwort (*Senecio squalidus*), hairy willowherb (*Epilobium hirsutum*), hoary ragwort (*Senecio erucifolius*), creeping thistle (*Cirsium arvense*), black medick (*Medicago lupulina*) and creeping bent (*Agrostis stolonifera*).

6.97 The Footprint Ecology report also lists the key plant species recorded in the SD1 *Arrhenatherum elatius* community. These include false oat grass (*Arrhenatherum elatius*), perennial sow-thistle, curled dock, sea mayweed, yellow horned poppy, sea

beet and up to 50% bare shingle. Bittersweet, field bindweed, hedge bindweed and prickly sow-thistle, all species typical of the SD1 Mixed *Sonchus* community, occur in stands opposite Osprey Quay, adjacent to the road. It appears to be a transitional community between typical SD1 and MG1 communities on the landward extreme of the shingle ridge.

6.98 As indicated by the Footprint Ecology survey, the SD1 communities recorded in this part of the SAC contain a high proportion of non-maritime species. An assessment of the species listed in paragraphs 6.96 to 6.97 against Ellenberg indicators shows that over 80% of species are not typical of sites with saline conditions or significant exposure to salt. The same proportion of species are associated with weakly-basic or weakly acid soils or soils that lie between weakly-basic or weakly acid and calcareous or high pH soils. The assessment also found that 75% of the plants recorded were typical of richly fertile sites or sites with above intermediate fertility.

6.99 Typical plant species of acid dune communities, such as those in the North Norfolk Coast SAC, tend to have Ellenberg scores of 6 or below which indicates that they occur in soils that are at least weakly-basic or weakly acid and are tending towards moderately acidic. The clustering for the communities on Portland would suggest that the shingle is not strongly acidic.

6.100 This is an important distinction as research in the Baltics has shown that dune communities on more acidic substrates (like those within parts of the North Norfolk Coast) with a parent material pH <6.0 show significant changes in species richness and community composition with low rates of wet nitrogen deposition (5-8kg/N/ha/yr), but these changes were not apparent at slightly calcareous sites (parent material pH > 6.0). This is due to the buffering offered by the carbonate system which prevents acidification occurring with moderate inputs of atmospheric nitrogen (Remke *et al*, 2009).

6.101 Site visits to the areas (Hamm Beach and Chesil Beach (August 2020 and June 2021)) found that the substrate was formed of reasonably sized shingle pebbles with extensive bare shingle present. In some areas comminuted organic detritus, gravel and sand occurs in the gaps between shingle pebbles; this is where the better developed vegetation stands occur. This matter may have derived from flooding events, rotting plant material or dust and mud from the road. The presence of this material seems to allow non-maritime species the opportunity to establish, as described by Rodwell and Footprint Ecology. As shown in photos 6 and 7, where loose bare shingle is present, early pioneer SD1 communities are present and appear to be re-establishing in some areas following disturbance to the shingle.

6.102 Following the evaluation of the species present within the Annex 1 habitat perennial vegetation of stony banks at the eastern end of Chesil Beach (from published research and a site visit) it is concluded that many of the species are typical of at least moderately nutrient rich environments. Assessment of the vegetation community against an acid sand dune community suggests that the Annex 1 habitats on Chesil Beach are not growing on strongly acid base material. It is possible that the application of a 8kg/N/ha/yr critical load threshold is too low for the communities that form part of the Annex 1 habitat in this particular part of the SAC.

6.103 The formation of vegetation communities in this area is influenced not only by air quality, but also the presence of a major road which is raised above the surrounding shingle bar and recent and more historic drainage features and the presence of Osprey Quay on the edge of Portland Harbour. A number of utilities, including gas mains, water mains, rising mains and electricity cables, are buried in the shingle either side of the A354 (see Appendix 4 and photos 12 to 15 in Appendix 3). The

maintenance of the flood defences and utilities will result in disturbance to the shingle communities in the areas adjacent to the road. Significant excavations could be considered to be akin to the displacement of shingle by large storm surges.

6.104 The presence of a number of man-made structures creates a pattern of ridges and depressions that effectively prevents further movement of the shingle eastwards into Portland Harbour and confines the shingle communities present to narrow bands, largely restricted to areas between anthropogenic features until the predominantly bare shingle west of the flood alleviation channel is reached.

6.105 The influences of these man-made features and historic elements will have a significant effect on the vegetation communities in this area. The area immediately west of the A354 is not subject to the same natural processes as much of the rest of the 28km long shingle bar that forms Chesil Beach. The vegetation communities and influence of natural processes are affected by the highly modified nature of this part of the site.

6.106 Given the composition of the community in this area, evidence from field visits that pioneer vegetation shingle communities will readily establish in this zone and the transitional nature of these stands, it is not considered that the additional nitrogen deposition that would occur as a result of the operation of the plant would result in any adverse effects on the integrity of Chesil and the Fleet SAC.

6.107 The highest predicted contribution of acid deposition from the ERF within the SAC is 1.3% of the critical load function for acid grassland. As discussed in paragraphs 6.98 to 6.99, the grassland communities within the SAC support assemblages of plants associated with weakly acidic to calcareous substrates. The PEC will be well below 70% of the long-term critical load for acid grassland with the operation of the proposed development. No adverse impacts on the integrity of the site from increased levels of acid deposition within Chesil and the Fleet SAC are predicted as a result of the proposed development.

6.108 The APIS website states that the Annex 1 habitat annual vegetation of drift lines is not sensitive to eutrophication and no critical load for this habitat is given. The very small increases in nitrogen deposition modelled to occur as a result of the proposed ERF would only occur along a very short length of the coast where this habitat may form. Given this Annex 1 habitat is not considered to be sensitive to nitrogen deposition, no adverse impacts on the integrity of the site from increased nitrogen deposition within Chesil and the Fleet SAC are predicted as a result of the proposed development.

6.109 The APIS website gives a critical load of 20-30kg/N/ha/yr for both Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) and coastal lagoons (a priority habitat). These habitats are not present within the zone of impact associated with the dispersion modelling for the ERF. The Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) mostly occur in the area around Abbotsbury Swannery and the Fleet (coastal lagoon) lies north of the visitor centre, west of the A354.

6.110 APIS gives background levels of nitrogen deposition of between 8.5 and 16.4kg/N/ha/yr for Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) and between 6.7 and 9.6kg/N/ha/yr for coastal lagoons. Even with the nitrogen deposition from traffic associated with the proposed development added to the background levels, the lower end of the critical load range given for these habitats would not be exceeded. No adverse impacts on the integrity of the site from increased nitrogen deposition within Chesil and the Fleet SAC are predicted as a result of the proposed development.

6.111 The APIS website gives a critical load of 20-30kg/N/ha/yr for the Annex 1 habitat Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruitcosi*). This habitat is not present within the zone of impact associated with the dispersion modelling of the proposed development.

6.112 APIS gives background levels of nitrogen deposition of between 8.5 and 16.4kg/N/ha/yr for Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruitcosi*). Even with the nitrogen deposition from traffic associated with the proposed development added to the background levels, the lower end of the critical load range given for this habitat would not be exceeded. No adverse impacts on the integrity of the site from increased nitrogen deposition within Chesil and the Fleet SAC are predicted as a result of the proposed development.

Chesil Beach and the Fleet SPA/Ramsar

6.113 The APIS website provides a range of critical loads for nitrogen deposition on habitats used by breeding little tern within the SPA. These range from 8-10kg/N/ha/yr to 10-20kg/N/ha/yr. The habitat used by wintering wigeon has a critical load of 20-30kg/N/ha/yr.

6.114 The air quality modelling undertaken by Fichtner (appendix D2 of the ES) shows the rate of nitrogen deposition (PC) within the SPA/Ramsar is below 1% of the lower end of the critical load given for nesting habitat used by little tern within the SPA/Ramsar and below 1% of the lower end of the critical load given for wintering wigeon.

6.115 The air quality modelling undertaken by Fichtner shows that the area of highest nitrogen deposition (0.9% of the lowest critical load given for the habitat used by breeding little tern) occurs outside of the SPA. Little tern nest at the eastern end of the Fleet. The breeding area is fenced off during the breeding season to prevent access and the site is wardened.

6.116 There is no published evidence of little tern breeding at the eastern extreme of Chesil Beach (beyond the boundary of the SPA) where the nitrogen deposition is predicted to be highest (0.9% of the relevant critical load). The tern colony is located c1.5km to the north west of where the highest level of nitrogen deposition is predicted to occur. No adverse impacts on the integrity of Chesil Beach and the Fleet SPA/Ramsar are predicted from the operation of the proposed development.

6.117 Wintering wigeon use the Fleet for foraging and roosting. The critical load for the habitat used by wintering wigeon is 20-30kg/N/ha/yr. The current levels of nitrogen deposition on the Fleet are below the lower end of the critical load given on APIS. Deposition associated with the proposed development will be under 1% of the relevant critical load for this habitat and levels will remain below the lower end of the critical load range once the scheme is operational.

6.118 The area of highest nitrogen deposition from the facility on habitat potentially suitable for nesting little terns falls outside the Ramsar boundary. As 8kg/N/ha/yr is one of the lowest critical loads set for habitats (5kg/N/ha/yr is the lowest end of the critical load range for habitats), it is considered sufficiently precautionary to conclude there will be no adverse impacts on other habitats within the Ramsar as a result of the implementation of this project. No adverse impacts on the integrity of Chesil Beach and the Fleet SPA/Ramsar are predicted from the operation of the proposed development.

6.119 Emissions from traffic linked to the proposed development are predicted to increase rates of nitrogen deposition close to the edge of the carriageway. The emissions from road traffic, combined with the background levels given on APIS, would not exceed

the lower end of the critical load range where the A354 runs adjacent to the Fleet. No impacts on wintering wigeon are anticipated. It is concluded there will be no adverse impacts on site integrity from the operation of the proposed development.

6.120 The little tern colony lies over 300m from the A354. At this distance contributions of nitrogen from road traffic will be minimal. No impacts on the nesting habitat of little terns associated with emissions from traffic linked to the proposed development are predicted. It is concluded there will be no adverse impacts on site integrity from the operation of the proposed development.

6.121 The scaly cricket is known to occur in two 10km grid squares (SY67 and SY68) on Chesil Beach. The bulk of this population live as interstitial residents within the shingle on the exposed seaward face of the shingle bank above the high-tide line. The animals emerge at night to feed on animal and vegetable matter associated with the strandline.

6.122 The predicted increase in nitrogen deposition would not lead to increased plant growth on the shingle ridge. Most of the plant communities that comprise the Annex 1 habitats form on the lee-side of the storm ridge. The tidal patterns of the local area and levels of strandline detritus would not be impacted by the project. It is concluded there will be no adverse impacts on site integrity from the operation of the proposed development.

Portland to Studland SAC

6.123 No potential impact pathways have been identified on the Portland to Studland SAC. The Standard Data form generated by JNCC in 2017 identifies two site threats: human intrusions and disturbances and fishing and harvesting aquatic resources. Neither pollution of surface water or air-borne pollutants are listed as threats for this site.

6.124 ABPmer has reviewed the information provided for the application and has concurred with the view that aerial pollution presents no credible risk to the SAC (see appendix 9.2 to the ES addendum).

Water pollution

Chesil and the Fleet SAC and Chesil Beach and the Fleet SPA/Ramsar

6.125 The location of the proposed ERF is situated over 2km from the nearest point of the SAC and over 3km from the entrance to the Fleet. There is the possibility that contaminated water or other pollutants could enter Portland Harbour via surface water discharge from the site and impact on the interest features of the SAC/SPA/Ramsar.

6.126 To mitigate the potential for contamination of the waters of Portland Harbour a framework CEMP has been prepared (see technical appendix C of the ES) which sets out industry standard good practice working methods and mitigation measures set out in the Environment Agency's Pollution Prevention Guidelines (PPGs) (withdrawn) and Guidance for Pollution Prevention (GPPs). This includes details of the management of water and sediment across the site and provisions to minimise the likelihood of run-off, provide containment of spillage and capture or treat wastewaters where necessary.

6.127 Given the distance of the SAC from the proposed development it is concluded that, provided the measures set out in the CEMP are followed, no adverse impacts on Chesil and the Fleet SAC will occur. ABPmer has reviewed the information provided for the application and has concurred with the view that water pollution presents no

credible risk to the SAC with the CEMP in place (see appendix 9.2 to the ES addendum). The CEMP will be approved by the competent authority prior to commencement of any works on site.

6.128 The adoption and implementation of measures set out in the CEMP will be sufficient to avoid any adverse impacts on site integrity relating to the Chesil Beach and the Fleet SPA/Ramsar.

Portland to Studland SAC

6.129 No potential impact pathways have been identified on the Portland to Studland SAC. The Standard Data form generated by JNCC in 2017 identifies two site threats: human intrusions and disturbances and fishing and harvesting aquatic resources. Neither pollution of surface water or air-borne pollutants are listed as threats for this site.

6.130 To mitigate the potential for contamination of the waters of Portland Harbour a framework CEMP has been prepared (see technical appendix C of the ES) which sets out industry standard good practice working methods and mitigation measures set out in the Environment Agency's Pollution Prevention Guidelines (PPGs) (withdrawn) and Guidance for Pollution Prevention (GPPs). This includes details of the management of water and sediment across the site and provisions to minimise the likelihood of run-off, provide containment of spillage and capture or treat wastewaters where necessary.

6.131 Given the distance of the SAC from the proposed development (2.6km to the south and over 6.5km to the east) it is concluded that, provided the measures set out in the CEMP are followed, no adverse impacts on Portland to Studland SAC will occur. ABPmer has reviewed the information provided for the application and has concurred with the view that water pollution presents no credible risk to the SAC with the CEMP in place (see appendix 9.2 to the ES addendum). The CEMP will be approved by the competent authority prior to commencement of any works on site.

6.132 The adoption and implementation of measures set out in the CEMP will be sufficient to avoid any adverse impacts on site integrity relating to Portland to Studland SAC.

Dust

Isle of Portland to Studland Cliffs SAC

6.133 Dust suppression measures that will be implemented on site are covered in the CEMP. Measures set out in the CEMP include the locating of dust causing activities as far away from the SAC boundary as possible, erecting solid screens or barriers along the boundary of the site adjacent to the SAC, covering stockpiles of earth, the imposition of a site speed limit, requirements to damp down stockpiles and dusty areas as appropriate, the use of enclosed chutes and conveyors, covering skips, minimising drop heights, and the use of water-assisted dust sweepers along track out routes and use of wheel-washes.

6.134 The adoption and implementation of measures set out in the CEMP will be sufficient to avoid any adverse impacts on site integrity relating to the Isle of Portland to Studland Cliffs SAC.

Traffic emissions

Crookhill Brick Pits SAC

6.135 No potential impact pathways have been identified on the Crookhill Brick Pits SAC. No significant emissions from the plant have been identified as occurring on this SAC and there will be no increases in traffic on the roads around this SAC related to this development. HGVs accessing the site during both the construction and operation will use Dorset Council's prescribed one-way system.

6.136 HGV traffic heading to Portland will be routed along the B3157 (off the A354) and then south along the B3156 until traffic rejoins the A354 in Wyke Regis. The roundabout of the A3157 and B3156 is the closest point along this route to the Crookhill Brick Pits SAC. This roundabout is over 275m from the SAC.

6.137 The trip generation rate for the proposed development is well below the 200 HGV screening threshold set out in Natural England guidance (2018) and the SAC is over 200m from a road that could potentially be affected by the operation using DMRB guidance. Even accounting for ammonia emission from HGVs no significant changes in nitrogen deposition on the SAC are anticipated.

6.138 Potential impacts on the Crookhill Brick Pits SAC are not considered likely due to the imperceptible increase in pollutants from the facility on this site and the distance of the site from roads receiving higher traffic flows due to the development. No adverse impacts on site integrity relating to the Crookhill Brick Pits SAC are predicted.

7.0 In-combination effects

7.1 A list of twelve projects have been identified for assessment of the likelihood of in-combination effects on the NSN sites.

7.2 Only impacts related to changes in air quality, water quality and generation of dust were identified as having potential impact pathways that could affect the interest features of the NSN sites. If any of the twelve projects identified generates the same impacts, these need to be considered for potential in-combination effects. Table 4 below presents a summary of the potential in-combination pathways identified for the twelve projects.

Project	Potential in-combination impact pathway		
	Dust generation	Changes in water quality in Portland Harbour	Changes in air quality
Ocean Views, Hardy Complex, Castle Road, Portland (phase 2)	Located adjacent to Isle of Portland to Studland Cliffs SAC	Unlikely to be direct run-off into Portland Harbour	Construction and post-construction traffic
Royal Manor Arts College, Weston Road, Portland	No, due to distance from application site	No, due to distance from Portland Harbour	Construction and post-construction traffic
Verne Common Road and Ventnor Road, Portland	No, due to distance from application site	No, due to distance from Portland Harbour	Construction and post-construction traffic
Southwell Primary School, Sweethill Lane, Portland	No, due to distance from application site	No, due to distance from Portland Harbour	Construction and post-construction traffic
Ferrybridge Inn, Portland Road, Weymouth	No, due to distance from application site	No, due to distance from Portland Harbour	Construction and post-construction traffic
Disused Quarry Works Stockyard, Bottom Coombe, Park Road, Portland	No, due to distance from application site	No, due to distance from Portland Harbour	Construction and post-construction traffic
Plot X, Mulberry Avenue, Portland: erection of two blocks of two storey business units comprising three B1 units and six B8 units (total floorspace 766 sqm) with associated parking and landscaping	No, due to distance from application site	No, due to distance from Portland Harbour	Construction and post-construction traffic
Plot M1B, Hamm Beach Road, Portland: erection of three industrial and commercial buildings (B1, B2 and B8, total floorspace 2,879 sqm) and associated external works	No, due to distance from application site	No, due to distance from Portland Harbour	Construction and post-construction traffic
The Heliport, Coode Way, Portland: Erection of building for servicing and maintenance of helicopters and additional facilities incidental to heliport use (outline - access, appearance, layout and scale). Council reference: WP/20/00467/OUT.	No, due to distance from application site	No, due to distance from Portland Harbour	Construction and post-construction traffic
Project Osprey: construction of two animal feed storage and distribution warehouses, each 140m x 45m x 20m, and an office building 16m x 4m x 5.15m, to handle 250,000-300,000 tonnes per year (Council reference: WP/19/00514/SCRE), currently under construction.	No, due to distance from application site	Potential for run-off into Portland Harbour	Construction and post-construction traffic

Project Inner Breakwater and Camber Area Alterations: development of operational land for the purposes of shipping and in connection with the embarking, disembarking, loading, discharging or transport of passengers, livestock or goods, including a new berth apron in the Crane Berth Apron Operational Area and a new yard pavement at the Camber Operational Yard to enable the berthing and handling of ships up to 120 m long, their cargoes and passengers (Council reference: WP/15/00328/PD).	No, due to distance from application site	Potential for run-off into Portland Harbour	Construction and post-construction traffic
Redundant buildings at Bumpers Lane, Portland. Demolition of existing redundant industrial buildings and erection of approximately 64 dwellings (application reference: WP/14/00330/OUT)	No, due to distance from application site	No, due to distance from Portland Harbour	Construction and post-construction traffic

Table 4: Potential in-combination effect pathways with other projects in the area

7.3 Ocean Views, Hardy Complex, Castle Road, Portland (phase 2) is the redevelopment of former naval accommodation block into 157 apartments, together with the development of 191 new build homes, with associated car parking (application reference: 02/00703/FUL, as amended). The consented works are likely to generate dust during the construction phase. However, dust generation is likely to be minimised through the adoption of industry best-practice measures. The distance between this site and the location for the ERF means any fugitive dust created will be deposited on different parts of the SAC. These dust accumulations are not considered likely to act in-combination and no adverse impacts on site integrity are anticipated.

7.4 The two Portland Harbour Revision Orders cover a number of developments within the port area. Those projects that have consent or are under construction have been included in the in-combination assessment: Project Osprey and Project Inner Breakwater and Camber Area Alterations.

7.5 Both Project Osprey and Project Inner Breakwater and Camber Area Alterations have the potential to result in pollution entering Portland Harbour during construction and operation. As with this project, it is anticipated works undertaken under the Harbour Revision Orders will follow industry best practice to reduce the risk of pollutants entering water bodies. Any pollution incident is likely to be localised in nature and the chances of similar events occurring at the same time on different sites at a sufficient scale to result in adverse impacts on site integrity are considered to be very small.

7.6 Portland Harbour Authority is a competent authority as set out in the Habitats Regulations 2017 (as amended). The remaining developments facilitated under the two Harbour Revision Orders, but not yet undertaken, may require planning permission or reliance on permitted development rights. Under Regulation 63 of the Habitat Regulations 2017 (as amended)if the implementation of any elements of the

HRO's require a consent, permission or other authorisation then the plan or project would require screening for likely significant effects and potentially appropriate assessment.

7.7 The requirement to screen projects for likely significant effects under Regulation 63 of the Habitat Regulations 2017 (as amended) applies to competent authorities that decide to undertake projects themselves irrespective of whether they require consent from any other body. In its Harbour Management Plan it is recognised that this applies to Portland Harbour Authority. The document specifically states that as Harbour Authority it will undertake appropriate assessment of the implications of development either individually or in combination to ascertain that any proposal will not affect the integrity of the Chesil and Fleet SAC. Given that any elements of the HRO's to be undertaken by the Harbour Authority will require screening under Regulation 63 for likely significant effects these future projects have been excluded from the in-combination assessment. This is consistent with Natural England guidance (see paragraph 4.47 of Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations).

7.8 The elements of the two Portland Harbour Revision Orders specifically excluded from the in-combination assessment are set out below:

7.9 Remaining development facilitated under the 1997 Portland Harbour Revision Order is as follows:

- Open storage of waste products, including waste wood and metal, on the Parade Ground area of the Rifle Range.
- High Speed Ferries: a cross-Channel passenger / car high speed ferry operating 2-3 daily sailings (round trips) over the 26-week summer season (April-October) and weekend sailings (Friday, Saturday and Sunday) over 20 weeks during the winter season.
- The HRO facilitates permitted development rights for carrying out a harbour undertaking and B1/B2/B8 development on several areas of land at the Port that have yet to be developed (areas Port 2, Port 5, Port 6 and Port 7 on the attached map).
- Landside aquaculture: construction of a warehouse building for aquaculture, producing 200-300 tonnes of fish, on a site measuring 135m x 37m (application references: WP/14/01033/OUT and WP/16/00150/RES) – these permissions have lapsed, but the site is being marketed as a potential development site for a similar use.

7.10 Outstanding development projects facilitated under the 2010 Portland Harbour Revision Order:

- New berthing faces to the north and east of New Quay and Coaling Pier Island (Works 1 and 5) and new berthing faces to the retaining structures to the south and west of Queen's Pier (Work 7) by the construction of concrete blockwork quay walls and/or piled and suspended deck sections and/or rock armoured rubble mound retaining embankments.
- Reclamation of as much of the foreshore and seabed as is required for the above works (Works 2, 6 and 8). Pollution incidents and noise during construction.
- Two 30m wide floating linkspans commencing on the new northern and eastern faces of the berthing faces adjacent to the shoreward arm of Queen's Pier (Work 3).

- A 30m wide floating linkspan commencing on the eastern face of Work 7 (Work 9)
- A mooring dolphin lying 70m to the east of the eastern face of Work 1, with bearing piles, mooring structures and reinforced concrete heads, connected to Work 1 by a steel access walkway (Work 4).
- Two lines of mooring dolphins up to 250m long and up to 70m apart, with bearing piles, mooring structures and reinforced concrete heads, connected by steel walkways and the permanent mooring at the dolphins of a floating dry-dock (Work 10).
- A reinforced concrete or steel pontoon providing access to and from Work 10 (Work 11).

7.11 All the projects set out in Table 4 will generate construction and post-construction traffic that has the potential to result in changes in air quality that could affect the interest features of the NSN sites.

Emissions from traffic (NOx) – Chesil and the Fleet SAC

7.12 The additional air quality modelling carried out to support the ES addendum (appendix 3.4 of the ES addendum) takes into account the potential for cumulative effects on traffic emissions as a result of development on Portland. Traffic flows associated with commenced Harbour Revision Order developments, the Ocean Views development and the Royal Manor Arts College development (as set out in Table 4) were specifically added into the future baseline traffic modelling. The traffic associated with the other smaller developments was included within the background traffic growth factors from Tempro that were applied to the baseline flows.

7.13 The modelling shows that alone the impact of the development (traffic and emissions from the plant) is negligible, with NOx only exceeding 1% of the relevant critical level within 2m of the edge of the carriageway. However, the cumulative growth in traffic flows along the A354 in-combination with emissions from the development (traffic and ERF) will result in NOx impacts exceeding 1% of the critical level within c45m of the carriageway.

7.14 With the changes in NOx emissions related to the development added to the cumulative traffic growth associated with other plans and projects, the concentration of NOx close to carriageway will be c90% of the critical level. The impacts of NOx emissions are localised, with levels falling to below 70% of the critical level within 7m of the road. The addition of the emissions from the proposed development (ERF and traffic) does not significantly change the extent of these modelled impacts, indicating that consented plans and projects are making the greatest contribution to increased levels of NOx along the A354 corridor (see figure 5). In figure 5 the do-minimum modelling shows the effects of background emissions, traffic growth and cumulative projects listed in Table 4; the do-something modelling adds in the ERF related emissions to the do-minimum modelling).

7.15 As the NOx levels remain below the relevant critical level set for the protection of vegetation no adverse impacts on site integrity relating to Chesil and the Fleet SAC are predicted.

Emissions from traffic (NH_3) - Chesil and the Fleet SAC

7.16 The modelling shows that alone the impact of the development (traffic and emissions from plant) is negligible, with NH_3 predicted to be less than 1% of the relevant critical level within 1m of the edge of the carriageway. However, the cumulative growth in traffic flows along the A354 in-combination with emissions from the development

(traffic and ERF) will result in NH_3 impacts exceeding 1% of the critical level within c30m of the carriageway.

7.17 When the changes in NH_3 emissions related to the development added to the cumulative traffic growth associated with other plans and projects are modelled, it shows the critical level of NH_3 will not be exceeded. The effects of increased NH_3 concentrations are localised, with levels falling to below 70% of the critical level within 4m of edge of the carriageway.

7.18 The addition of the emissions from the proposed development (ERF and traffic) do not significantly change the extent of these modelled impacts, indicating that consented plans and projects are making the greatest contribution to increased levels of NH_3 along the A354 corridor (see figure 6).). In figure 6 the do-minimum modelling shows the effects of background emissions, traffic growth and cumulative projects listed in Table 4; the do-something modelling adds in the ERF related emissions to the do-minimum modelling).

7.19 The Footprint Ecology report identifies the grassland to the east of the A354 as MC5 shingle grassland with c0.2ha of SM25. Rodwell notes that bryophytes occur at low frequencies throughout MC5 shingle grassland but in *some* sub-communities they and lichens *may* attain up to 20% cover. Bryophytes are generally scarce in MC8 communities as the grasses form a closed sward (Rodwell, 2000).

7.20 Information on Hamm Beach provided by DERC (Edwards, 2021) notes the more open stands of MC8 and the few very small stands of SD19 support the moss *Syntrichia ruralis* var. *ruraliformis,* which is typical of more calcareous sand dunes, with *Hypnum cupressiforme* var. *lacunosum* forming extensive patches in places. Lichens are not a major component of the vegetation communities in this area.

7.21 Thrift (*Armeria maritima*) and red fescue (*Festuca rubra*) are constants of both the MC5 and MC8 communities (Rodwell, 2000). It is likely that the differences in classification of these shingle grasslands as either MC5 or MC8 depend on the interpretation of the surveyors.

7.22 The lack of lichens and bryophytes present in these particular maritime grassland and pioneer shingle communities alongside the A354 means that the very localised increases in NH_3 predicted from the in-combination assessment are considered unlikely to result in an adverse effect on site integrity.

7.23 The concentration of NH_3 falls to less than 1µg/m^3 within c45m of edge of carriageway. Shingle communities supporting lichens and bryophytes are known to occur west of the A354 on Chesil Beach and the in-combination assessment shows that ammonia levels will not exceed the critical level set for the protection of lower plants in the zone 50-200m from the A354.

7.24 It should be noted that the APIS dataset does not source apportion the concentration. Therefore, it is not possible to remove the road contribution modelled from the background figures. As such the PEC is likely to be an overestimation for the PEC as the baseline contribution from road sources will be double counted.

7.25 No adverse impacts on site integrity relating to Chesil and the Fleet SAC are predicted.

Emissions from traffic (nitrogen deposition) - Chesil and the Fleet SAC

7.26 The modelling shows that alone the impact of the development (traffic and emissions from the plant) will result in nitrogen deposition rates of more than 1% of the critical load within c50m of the edge of the carriageway. The highest rates of nitrogen

deposition occur within 10m of road edge where baseline levels are over 13kg/N/ha/yr. The greatest source of nitrogen deposition is NH_3 from road traffic emissions (see figure 7).). In figure 5 the do-minimum modelling shows the effects of background nitrogen deposition, traffic growth and cumulative projects listed in Table 4; the do-something modelling adds in the ERF related nitrogen to the do-minimum modelling).

7.27 With the changes in nitrogen deposition related to the development added to the cumulative traffic growth associated with other plans and projects the additional nitrogen deposition will exceed 1% of the critical load of nitrogen over 200m from the edge of the carriageway. The addition of the emissions from the proposed development (ERF and traffic) does not significantly change the extent of these modelled impacts, indicating that consented plans and projects are making the greatest contribution to increased levels of nitrogen deposition along the A354 corridor.

7.28 Information given on APIS for Portland Harbour Shore SSSI (the area east of the A354) lists two habitats as present: SM14 (littoral sediment – *Atriplex portulacoides* saltmarsh) and MC8 (Supralittoral rock – *Festuca rubra – Armeria maritima* grassland).The APIS website notes that lichens and bryophytes are not present within these habitats. A critical load of 20-30kg/N/ha/yr is given for saltmarsh habitat. No nitrogen critical load is given for MC8 grassland, but the website notes that this habitat is sensitive to nitrogen deposition.

7.29 The grassland to the east of the A354 is MC5 shingle grassland (c 5.59ha, with c0.2ha of SM25). On the western side of the A354, the habitats comprise MG1a moving to MC11b south of the car park and then various SD1 communities are present immediately adjacent to the road. Further away from the road stands of MC5, MC11 and MC8 grassland are present.

7.30 Tables 2 and 3 show that there was little change in the areas of vegetated shingle and shingle grassland within the SAC between 2005 and 2018. This would indicate that changes in air quality are not driving significant changes in the vegetation communities along this stretch of the A354. These areas immediately adjacent to the road will already be experiencing elevated levels of nitrogen deposition from traffic emissions. Data on APIS shows that total nitrogen deposition (as the 5km gridded average) across the SAC has fallen from a high point in 2010, with road traffic emissions representing around 6% of deposition of nitrogen to the SAC.

7.31 It should be noted that the detailed air quality modelling produced by Fichtner for the A354 corridor highlights that baseline levels of nitrogen deposition (when allowing for the spatial variation due to the presence of the A354) are far higher than the gridded average for the relevant 5km grid square provided by APIS. It is likely that rates of nitrogen deposition along the road corridor have exceeded the upper end of the critical load range for many years close to the A354. The findings of the Footprint Ecology survey show that a high proportion of species found in the SD1 communities close to the A354 are species associated with fertile sites (see paragraphs 6.96-6.98).

7.32 The higher levels of nitrogen deposition this area of the site experiences does not appear to be driving any significant changes in the species communities in this part of the SAC. The Groome and Crowther and Footprint Ecology vegetation surveys found little difference in the NVC communities along the A354. The work published by Caporn *et al*, 2016 highlights that for a range of vegetation communities the incremental effect of long-term nitrogen deposition on species richness reduces as deposition levels increase above the upper end of the critical load. For sand dune

and heathland habitats increased nitrogen deposition can lead to increases in graminoid cover that could alter the species composition of certain habitat types.

7.33 When considering species-richness in sand dune habitats the Caporn *et al*, 2016 study found that where background levels of nitrogen deposition are 10kg/N/ha/yr. increases in nitrogen deposition of between 0.5 and 0.6kg/N/ha/yr. are required to reduce measured species richness by one species. This amount of nitrogen needed increases to between 0.9 and 1.1kg/N/ha/yr. where background nitrogen deposition is 15kg/N/ha/yr. and to between 1.3 and 2.0kg/N/ha/yr. where background nitrogen deposition is 20kg/N/ha/yr. The pattern of increasing large amounts of additional nitrogen deposition required to reduced species richness by one species as background levels of nitrogen deposition increase is also common to upland heath, lowland heath and acid grassland habitats.

7.34 The site-specific modelling along the A354 has shown high baseline levels of nitrogen deposition occur in this part of the site irrespective of the proposed development. Current rates of nitrogen deposition exceed the upper end of the critical load range and have almost certainly been towards the upper end of the critical load range for many years along the A354 corridor.

7.35 There is no published evidence to suggest that nitrogen deposition at the level predicted to occur from the project is sufficient to change species richness in a range of plant communities. The ability of pioneer SD1 communities to develop, as reported in the Footprint report and observed during a site visit in June 2021, would indicate that the localised high levels of nitrogen deposition occurring in this part of the SAC are not having an adverse effect on the integrity of the site, with SD1 vegetation communities able to form when conditions are suitable.

7.36 It should be noted that the APIS dataset does not source apportion the nitrogen deposition. Therefore, it is not possible to remove the road contribution modelled from the background figures. As such the PEC is likely to be an overestimation for the PEC as the baseline contribution from road sources will be double counted.

7.37 The stable nature of the communities along the A354, as evidenced by vegetation surveys, would indicate that the plant communities associated with vegetated shingle remain largely unchanged since the designation of the site. No adverse impacts on site integrity relating to Chesil and the Fleet SAC are predicted.

Emissions from traffic (NOx) – Isle of Portland to Studland Cliffs SAC

7.38 The modelling shows that alone the impact of the development (traffic and emissions from the plant) is negligible, with NOx only exceeding 1% of the relevant critical level within c20m of the edge of the carriageway. The cumulative growth in traffic flows in-combination with emissions from the development (traffic and ERF) show little perceptible change in NOx concentrations.

7.39 APIS shows that background levels of NOx around the Port already exceed the critical level set for the protection of ecosystems. With the changes in NOx emissions related to the development added to the cumulative traffic growth associated with other plans and projects, there will be an increase in NOx concentrations above 1% of the critical level of NOx within a zone c8m wide on the northern boundary of the SAC (accounting for the fact the SAC boundary is located c12m from road edge), beyond this zone the contribution will fall to below 1% of the critical level.

7.40 As already discussed, NOx concentrations across the SAC south of the Port are considered highly likely to reduce as the distance from emission sources at the Port and port roads increases. This conclusion is supported by the far lower background

levels of NOx recorded in the grid squares immediately to the east, south and west of the Port. As NOx concentrations are expected to be lower south of the Port (within the SAC) no adverse impacts on site integrity, relating to the Isle of Portland to Studland Cliffs SAC, are predicted from the small increase in NOx levels identified by the modelling.

Emissions from traffic (NH_3) – Isle of Portland to Studland Cliffs SAC

7.41 The modelling shows that alone the impact of the development (traffic and emissions from the plant) will result in an increase in NH_3 above 1% of the relevant critical level (1µg/m^3 set for lichens and bryophytes) for a zone of c30m within the SAC. The increase is less than 1% of the relevant critical load for non-lichen sensitive communities (3µg/m^3) within the SAC. The cumulative growth in traffic flows in this area in-combination with emissions from the development (traffic and stack) show a similar pattern.

7.42 The critical level for NH_3 (either at 1µg/m^3 or 3µg/m^3) is not exceeded within the SAC with the in-combination traffic factored in. No adverse impacts on site integrity relating to the Isle of Portland to Studland Cliffs SAC are predicted.

Emissions from traffic (nitrogen deposition) – Isle of Portland to Studland Cliffs SAC

7.43 The modelling shows that alone the impact of the development (traffic and emissions from the plant) will result in nitrogen deposition rates of below 1% of the critical load kg/N/ha/yr within the SAC. The greatest source of nitrogen deposition is NH_3 from road traffic emissions.

7.44 When the changes in nitrogen deposition related to the development added to the cumulative traffic growth associated with other plans and projects, slightly increases the rate of nitrogen deposition within the SAC. However, the lower end of the critical load range given for nitrogen deposition on calcareous grassland habitat within the SAC will not be exceeded. No adverse impacts on site integrity relating to the Isle of Portland to Studland Cliffs SAC are predicted.

8.0 Conclusion

8.1 The assessment of the application concluded that, in the absence of avoidance and mitigation measures, the project was likely to result in a significant effect on the Isle of Portland to Studland Cliffs SAC and Chesil and the Fleet SAC. This document sets out a shadow appropriate assessment for the Portland Energy Recovery Facility, in accordance with Regulation 63 of the Conservation of Habitats and Species Regulations 2017 (as amended).

8.2 The shadow appropriate assessment evaluated the mitigation measures; those embedded in the design of the facility and those where mitigation measures will need to be conditioned through any planning permission, to determine if these were sufficient to prevent adverse impacts on site integrity.

8.3 On the basis of the mitigation measures set out in this document it is concluded that the construction and operation of the Portland Energy Recovery Facility will not have an adverse effect on the integrity of the NSN sites assessed, either alone or in-combination with other plans and projects.

8.4 As the competent authority, Dorset Council is required to undertake its own independent appropriate assessment. The council can choose to adopt this document, following professional scrutiny to evaluate the evidence presented and examine the conclusions reached; or it can undertake its own appropriate assessment using the material provided as part of the planning application and any other relevant material from the applicant requested under Regulation 63.

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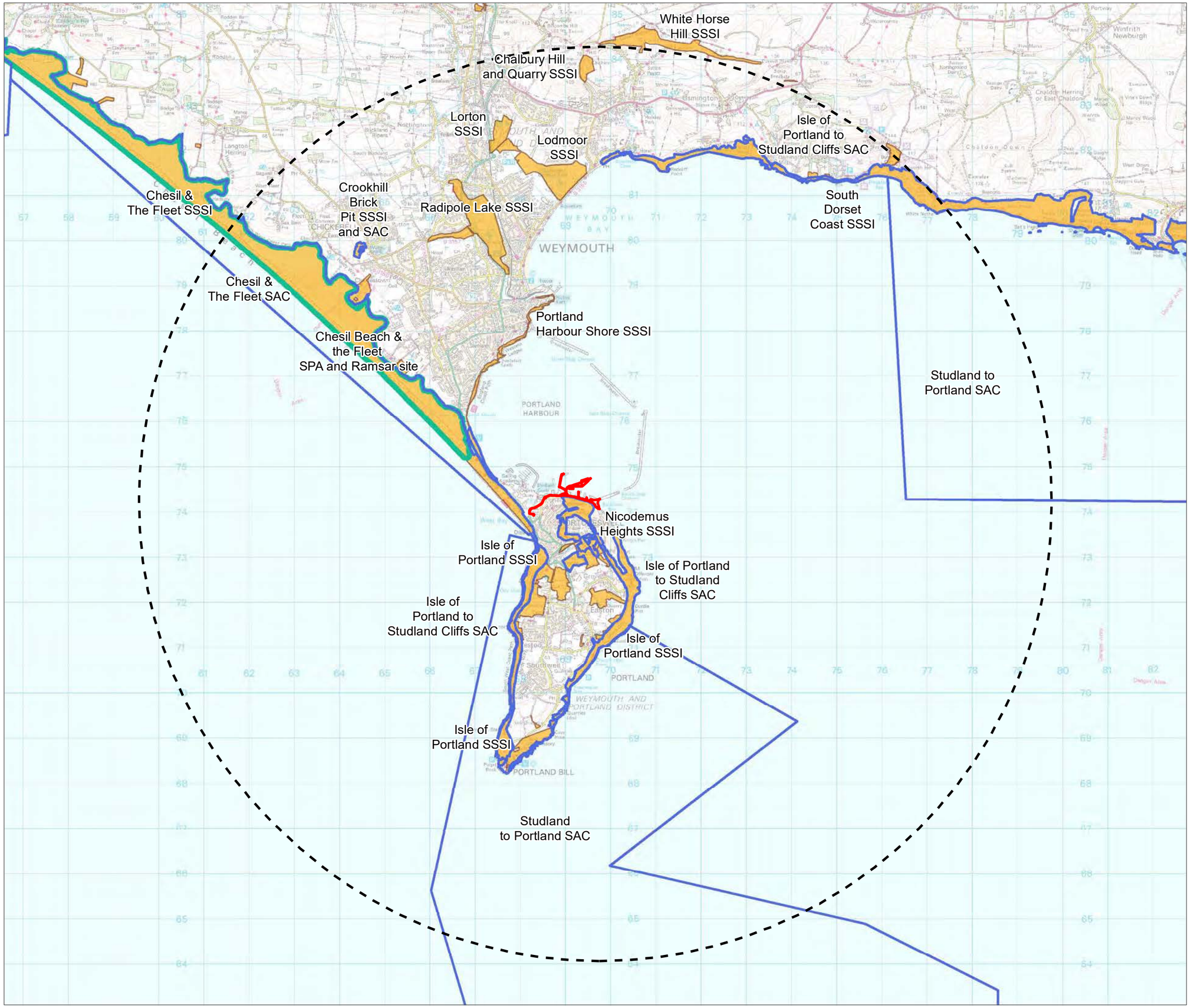


- Site boundary
- 10km study area
- Special Area of Conservation
- Special Protection Area and Ramsar site
- Site of Special Scientific Interest

Portland ERF
Powerfuel Ltd

0 3,000 m

N

Figure 1: NSN sites

Dwg no/2627014/01	Revision	
Status	25 June 2021	
Scale: 1:80,000 @A3	Drawn by: JC	Checked by: JP

LONDON
23 Heddon Street
London W1B 4BQ

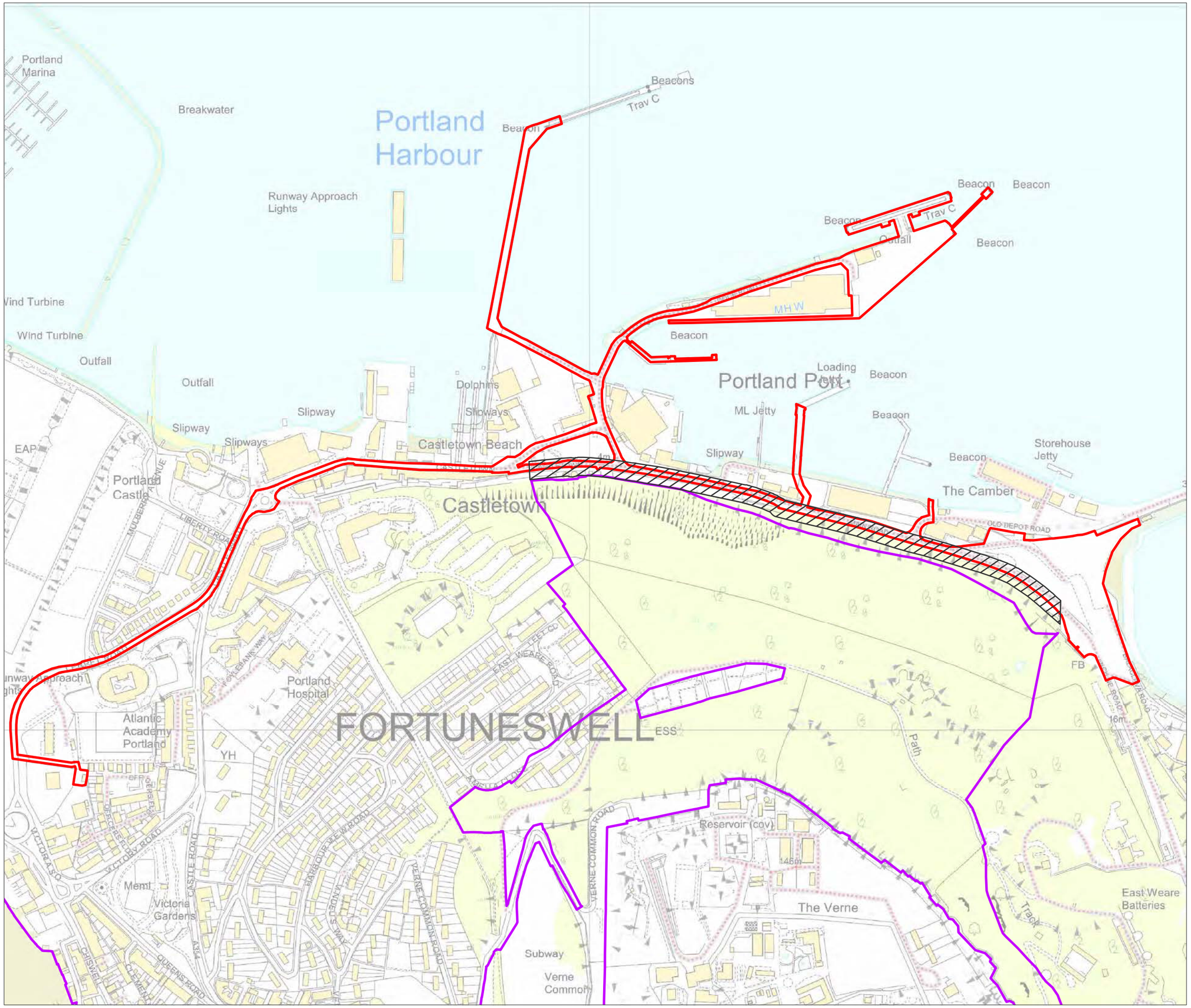
BIRMINGHAM
Enterprise House 115 Edmund Street
Birmingham B3 2HJ

BOURNEMOUTH
Everdene House Deansleigh Road
Bournemouth BH7 7DU

TERENCE O'ROURKE

TELEPHONE
020 3664 6755

www.torltd.co.uk



Site boundary

Isle of Portland to Studland Cliffs Special Area of Conservation

Cumulative air quality impact zone (12.5m buffer)

Portland ERF
Powerfuel Ltd

0 125 m

N

Figure 2: Zone of impact for cumulative emissions from Isle of Portland to Studland Cliffs SAC

Dwg no/2627014/02	Revision
Status	21 June 2021
Scale: 1:5,000 @A3	Drawn by: JC / Checked by: JP

LONDON
23 Heddon Street
London W1B 4BQ

BIRMINGHAM
Enterprise House 115 Edmund Street
Birmingham B3 2HJ

BOURNEMOUTH
Everdene House Deansleigh Road
Bournemouth BH7 7DU

TERENCE O'ROURKE

TELEPHONE
020 3664 6755

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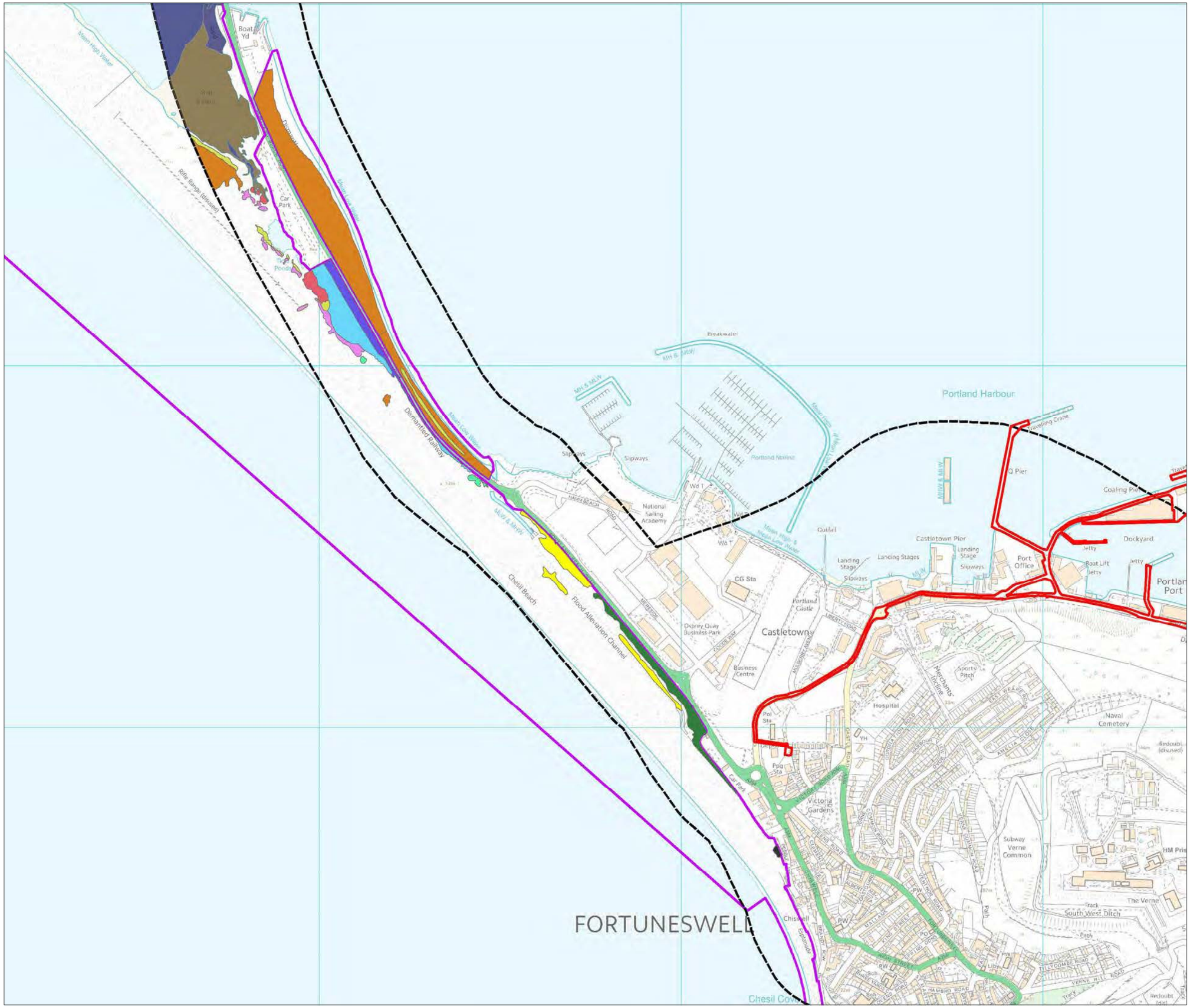

Portland ERF
Powerfuel Ltd

0 250 m

N

Figure 3: NVC communities along A354

Dwg no/2627014/03	Revision
Status	21 June 2021
Scale: 1:10,000 @A3	Drawn by: JC / Checked by: JP

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Enterprise House 115 Edmund Street
Birmingham B3 2HJ

BOURNEMOUTH
Everdene House Deansleigh Road
Bournemouth BH7 7DU

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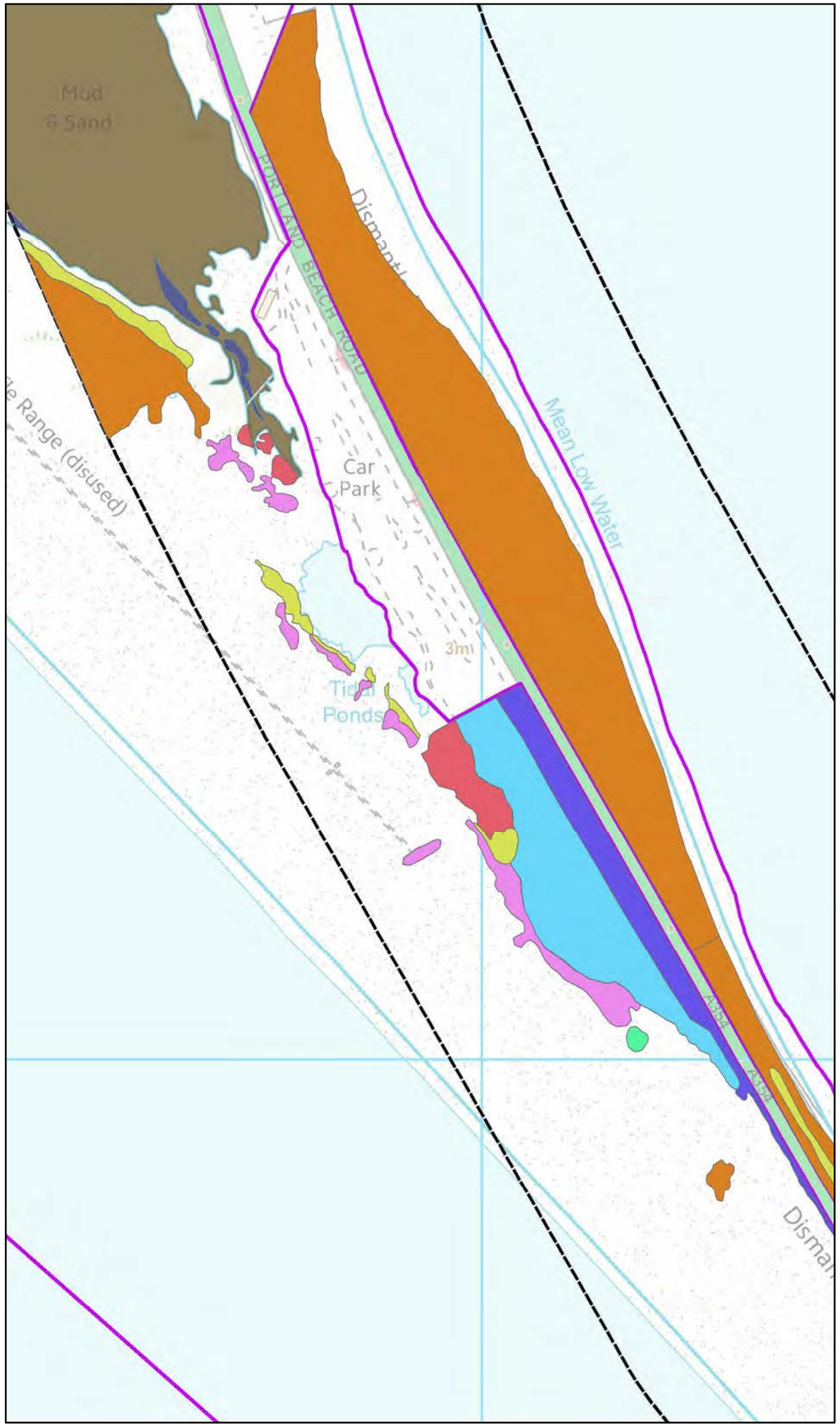

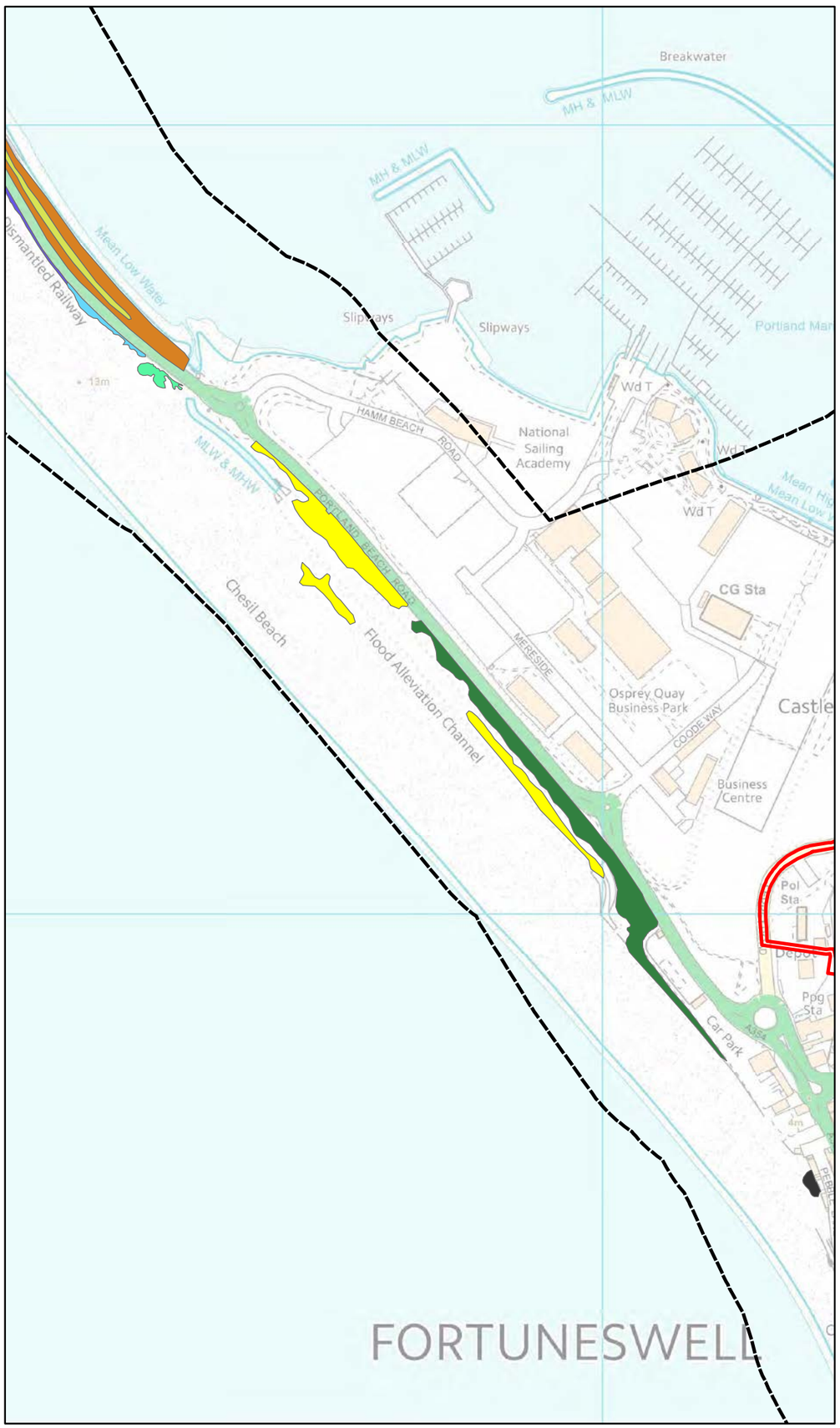

Site boundary

Study area

Special Area of Conservation

Natural England Priority Habitat Inventory

Mudflats

Saline lagoons

Footprint Ecology

MC11b Elytrigia Carex

MC5

MC8a

MG1a

SD1 Mixed Sonchus

SD1 Silene

SD1a Crambe

SD1b Arrhenatherum

SM14

SM25

Portland ERF
Powerfuel Ltd

0 100 m

N

Figure 4: NVC communities along A354 (zoomed in)

Dwg no/2627014/04	Revision
Status	21 June 2021
Scale: 1:4,000 @A3	Drawn by: JC / Checked by: JP

LONDON
23 Heddon Street
London W1B 4BQ

BIRMINGHAM
Enterprise House 115 Edmund Street
Birmingham B3 2HJ

BOURNEMOUTH
Everdene House Deansleigh Road
Bournemouth BH7 7DU

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020 3664 6755

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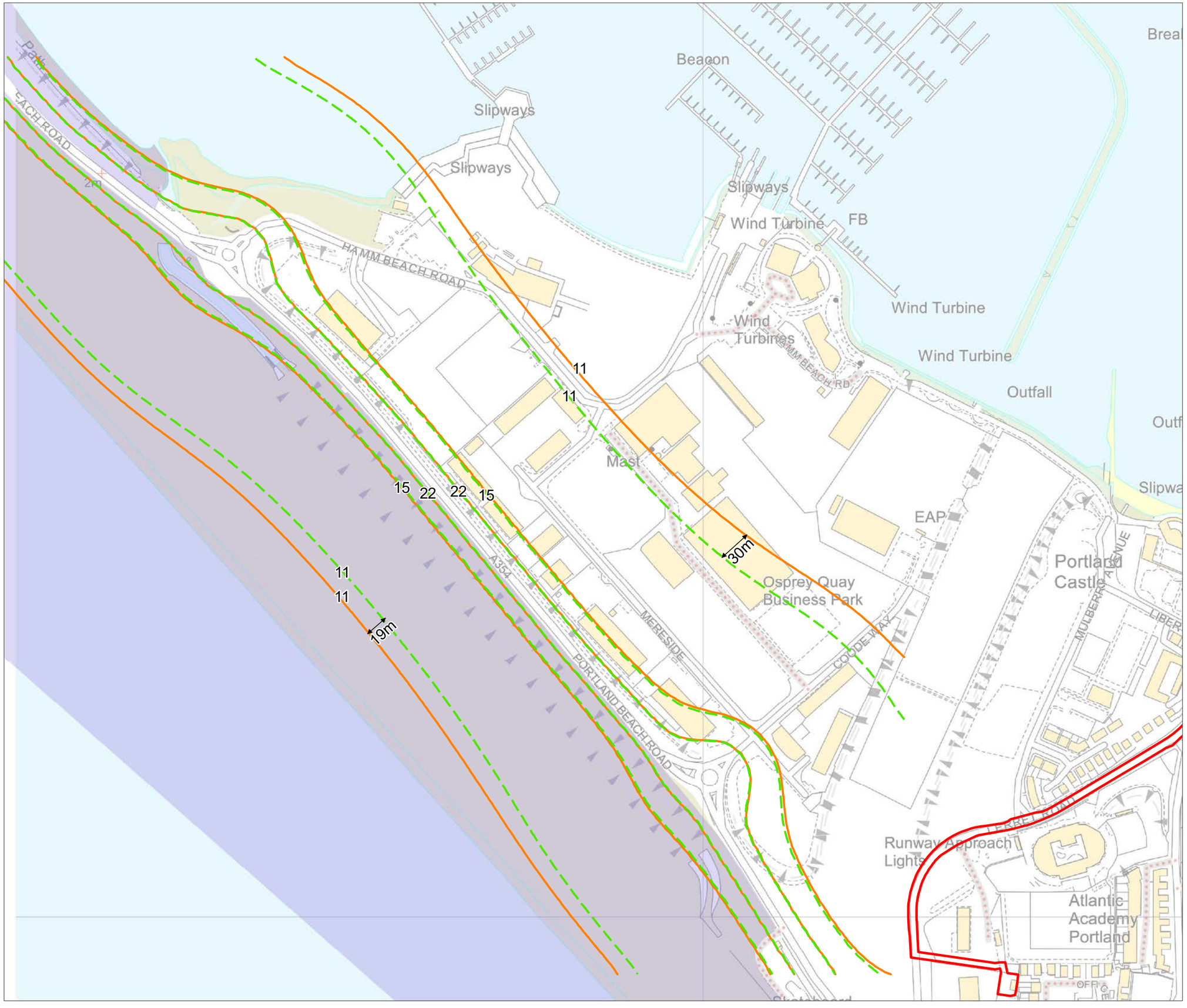

Figure 5: Modelled NOx concentrations (do-minimum and do something scenarios) - showing 22, 15 and 11 µg/m³ contours

Dwg no/2627014/E001	Revision
Status	25 January 2022
Scale: 1:3,500 @A3	Drawn by: JC / Checked by: JP

LONDON
23 Heddon Street
London W1B 4BQ

BIRMINGHAM
3 Edmund Gardens 117 Edmund Street
Birmingham B3 2HJ

BOURNEMOUTH
Everdene House Deansleigh Road
Bournemouth BH7 7DU

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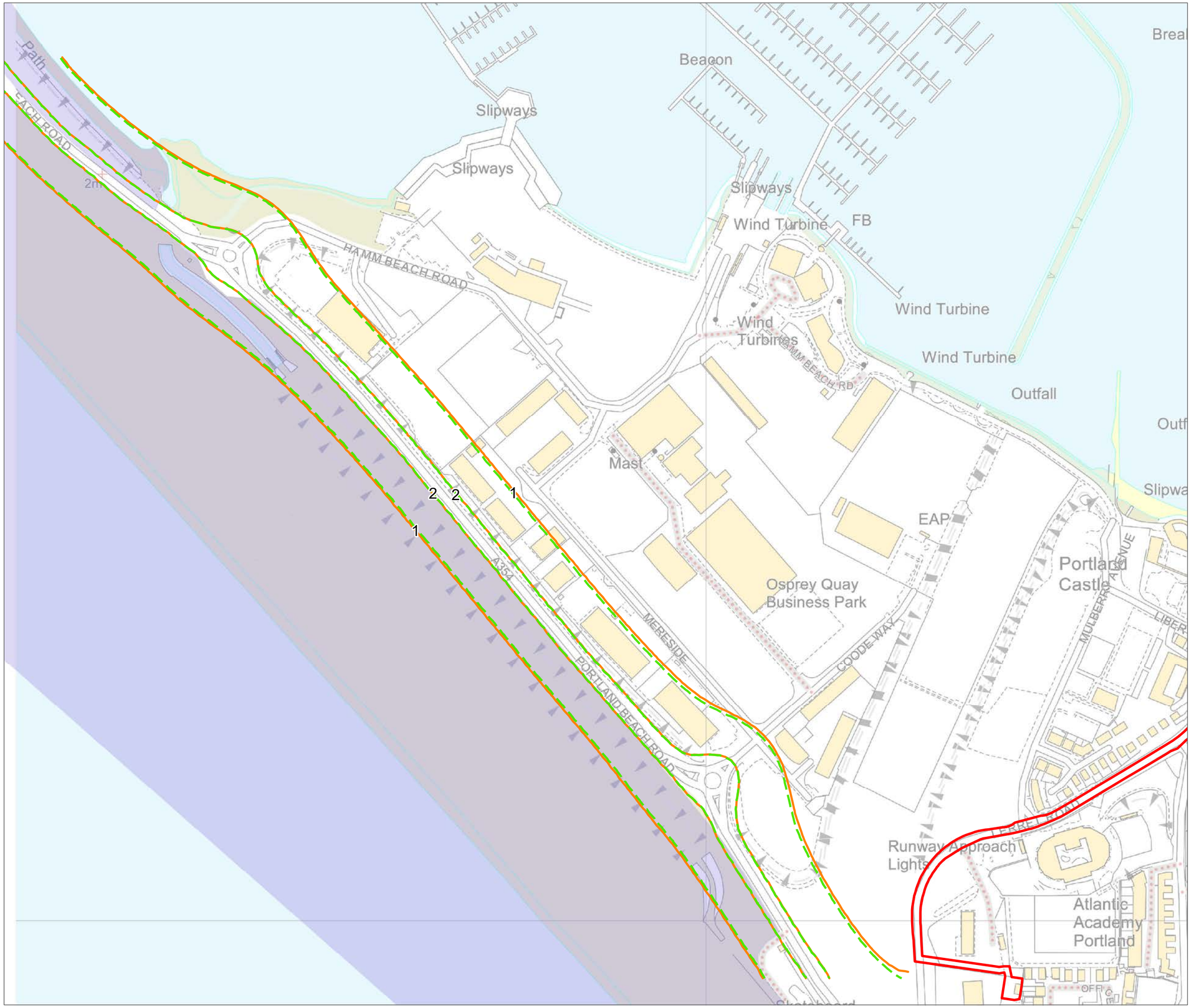

Ammonia (NH_3) contour µg/m^3 - Do minimum

Ammonia (NH_3) contour µg/m^3 - Do something

Special Area of Conservation

Site boundary

Portland ERF
Powerfuel Ltd

0 100 m

N

Figure 6: Modelled NH_3 concentrations (do-minimum and do something scenarios) - showing 1 and 2 µg/m^3 contours

Dwg no/2627014/E001	Revision
Status	25 January 2022
Scale: 1:3,500 @A3	Drawn by: JC / Checked by: JP

LONDON
23 Heddon Street
London W1B 4BQ

BIRMINGHAM
3 Edmund Gardens 117 Edmund Street
Birmingham B3 2HJ

BOURNEMOUTH
Everdene House Deansleigh Road
Bournemouth BH7 7DU

TERENCE O'ROURKE

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020 3664 6755

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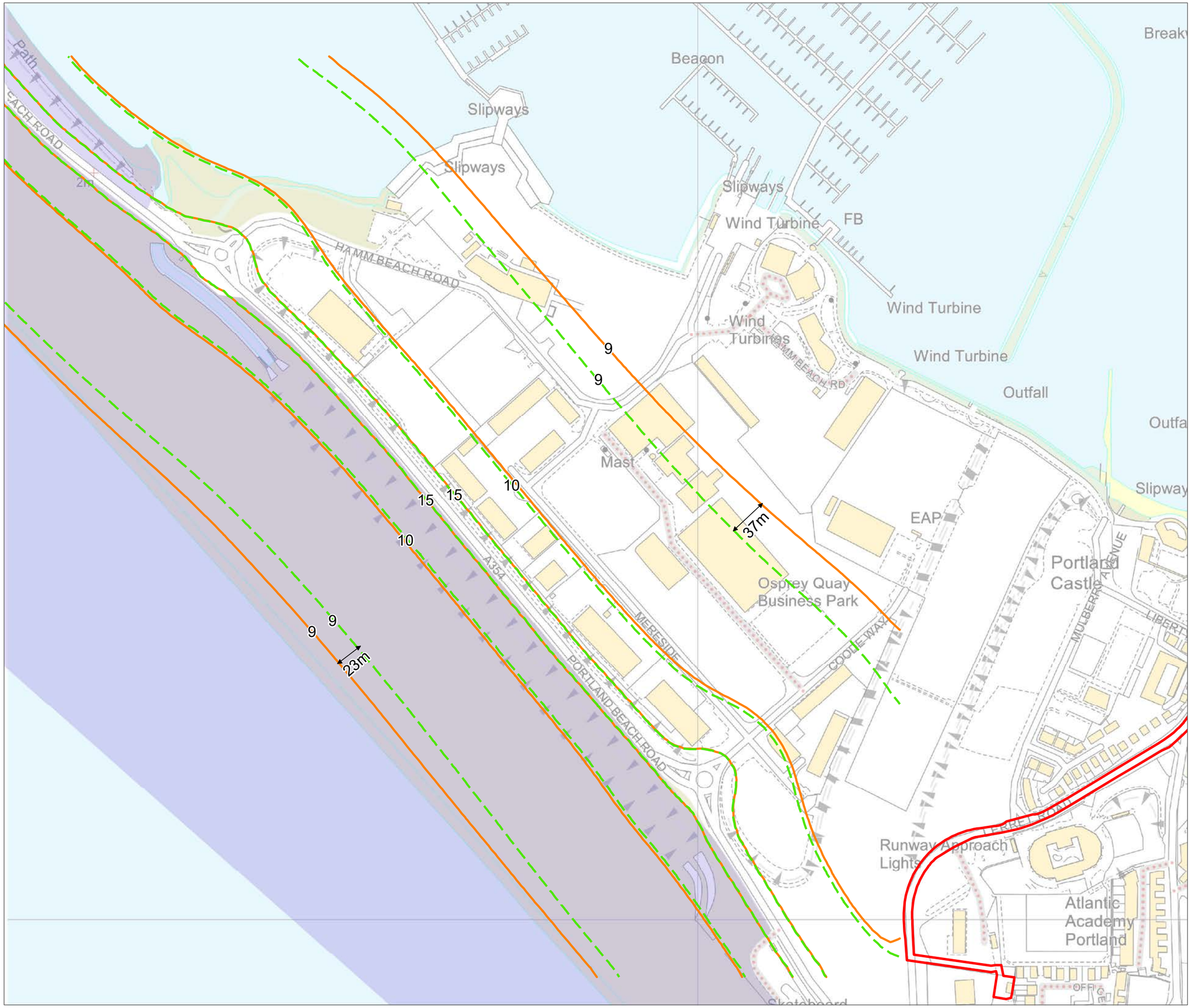

Ndep contour kgN/ha/yr - Do minimum

Ndep contour kgN/ha/yr - Do something

Special Area of Conservation

Site boundary

Portland ERF
Powerfuel Ltd

0 100 m

N

Figure 7: Modelled N deposition (do-minimum and do something scenarios) - showing 15, 10 and 9 kg/N/ha/yr contours

Dwg no/2627014/E001	Revision
Status	25 January 2022
Scale: 1:3,500 @A3	Drawn by: JC / Checked by: JP

LONDON
23 Heddon Street
London W1B 4BQ

BIRMINGHAM
3 Edmund Gardens 117 Edmund Street
Birmingham B3 2HJ

BOURNEMOUTH
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Bournemouth BH7 7DU

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Appendix 1: Ramsar information sheet and SPA and SAC citations

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0030349**

SITENAME **Crookhill Brick Pit**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
B	UK0030349

1.3 Site name

Crookhill Brick Pit

1.4 First Compilation date	1.5 Update date
2004-07	2015-12

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

Date site proposed as SCI:	2004-07
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.504444444	50.61638889

2.2 Area [ha]:

4.64

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK2	Dorset and Somerset

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
A	1166	Triturus cristatus			p	101	250	i		M	C	B	B	B

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N16	35.0
N23	10.0
N06	5.0
N09	50.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: clay,neutral 2 Terrestrial: Geomorphology and landscape: lowland

4.2 Quality and importance

Triturus cristatus for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	K02		I

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/3212324
http://publications.naturalengland.org.uk/category/6490068894089216

http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

☐	Yes
☐	No, but in preparation
☒	No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

NATURA 2000 – STANDARD DATA FORM

Special Areas of Conservation under the EC Habitats Directive (includes candidate SACs, Sites of Community Importance and designated SACs).

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information. The data form for this site has been generated from the Natura 2000 Database submitted to the European Commission on the following date:

22/12/2015

The information provided here, follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

As part of the December 2015 submission, several sections of the UK's previously published Standard Data Forms have been updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

More general information on Special Areas of Conservation (SACs) in the United Kingdom is available from the SAC home page on the JNCC website. This webpage also provides links to Standard Data Forms for all SACs in the UK.

Date form generated by the Joint Nature Conservation Committee
25 January 2016.

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK0019861**

SITENAME **Isle of Portland to Studland Cliffs**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

Back to top

1.1 Type	1.2 Site code
B	UK0019861

1.3 Site name

Isle of Portland to Studland Cliffs

1.4 First Compilation date	1.5 Update date
1998-06	2015-12

1.6 Respondent:

Name/Organisation:	Joint Nature Conservation Committee
Address:	Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY
Email:	

Date site proposed as SCI:	1998-06
Date site confirmed as SCI:	2004-12
Date site designated as SAC:	2005-04
National legal reference of SAC designation:	Regulations 11 and 13-15 of the Conservation of Habitats and Species Regulations 2010 (http://www.legislation.gov.uk/uksi/2010/490/contents/made).

2. SITE LOCATION

2.1 Site-centre location [decimal degrees]:

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Longitude	Latitude
-2.2261	50.6206

2.2 Area [ha]:

1441.75

2.3 Marine area [%]

0.0

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK2	Dorset and Somerset

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	AIBICID	AIBIC		
						Representativity	Relative Surface	Conservation	Global
1210			1.44		G	C	C	C	C
1220			1.44		G	D			
1230			576.7		M	A	B	A	A
6210			792.96		G	A	C	A	B

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive

92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
P	1654	Gentianella anglica			p	1001	10000	i		M	C	B	C	B
A	1166	Triturus cristatus			p				P	DD	D			

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N08	5.0
N09	55.0
N05	40.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: basic,sedimentary 2 Terrestrial: Geomorphology and landscape: coastal,lowland 3 Marine: Geology: limestone/chalk 4 Marine: Geomorphology: cliffs

4.2 Quality and importance

Annual vegetation of drift lines for which the area is considered to support a significant presence. which is considered to be rare as its total extent in the United Kingdom is estimated to be less than 100 hectares. Vegetated sea cliffs of the Atlantic and Baltic coasts for which this is considered to be one of the best areas in the United Kingdom. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (Festuco-Brometalia) for which this is considered to be one of the best areas in the United Kingdom. Gentianella anglica for which this is considered to be one of the best areas in the United Kingdom.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
	Threats		

Positive Impacts			
	Activities,	Pollution	

Rank	and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	G01		I
H	A01		I
H	I01		B
H	K02		I
H	A04		I

Rank	management [code]	(optional) [code]	inside/outside [i|o|b]
H	A03		I
H	A06		I
H	B02		I
H	A04		I
H	A02		I

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

7. MAP OF THE SITES

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INSPIRE ID:

Map delivered as PDF in electronic format (optional)

[ ] Yes [X] No

Reference(s) to the original map used for the digitalisation of the electronic boundaries (optional).

NATURA 2000 – STANDARD DATA FORM

Special Protection Areas (SPAs) classified under Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version), also known as the 'Birds Directive'

and

Special Areas of Conservation (SACs) (includes candidate SACs, Sites of Community Importance (SCIs) and designated SACs) designated under Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, also known as the 'Habitats Directive'

Each Natura 2000 site in the United Kingdom has its own Standard Data Form containing site-specific information.

The information provided here follows the officially agreed site information format for Natura 2000 sites, as set out in the Official Journal of the European Union recording the Commission Implementing Decision of 11 July 2011 (2011/484/EU).

The Standard Data Forms are generated automatically for all of the UK's Natura 2000 sites using the European Environment Agency's Natura 2000 software. The structure and format of these forms is exactly as produced by the EEA's Natura 2000 software (except for the addition of this coversheet and the end notes). The content matches exactly the data submitted to the European Commission.

Please note that these forms contain a number of codes, all of which are explained either within the data forms themselves or in the end notes.

Further technical documentation may be found here:
http://bd.eionet.europa.eu/activities/Natura_2000/reference_portal

In December 2015, several sections of the UK's previously published Standard Data Forms were updated. For details of the approach taken by the UK in this submission please refer to the following document:
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf.
These changes formed part of the UK Submission to the European Commission on 22/12/2015.

More general information on Special Protection Areas (SPAs) and Special Areas of Conservation (SACs) in the United Kingdom, including in Gibraltar, is available from the SPA homepage and SAC homepage on the JNCC website. These webpages also provide links to Standard Data Forms for all Natura 2000 sites in the UK.

Date Standard Data Form generated by the Joint Nature Conservation Committee:	14th November 2017 (UK Tranche 56)

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **UK9010091**

SITENAME **Chesil Beach and The Fleet**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

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1.1 Type	1.2 Site code
A	UK9010091

1.3 Site name

Chesil Beach and The Fleet

1.4 First Compilation date	1.5 Update date
1985-07	2017-11

1.6 Respondent:

Name/Organisation: Joint Nature Conservation Committee

Address: Joint Nature Conservation Committee Monkstone House City Road Peterborough PE1 1JY

Email:

1.7 Site indication and designation / classification dates

Date site classified as SPA:	1985-07
National legal reference of SPA designation	Regulations 12A and 13-15 of the Conservation Habitats and Species Regulations 2010, (http://www.legislation.gov.uk/uksi/2010/490/contents/made) as amended by The Conservation of Habitats and Species (Amendment) Regulations 2011 (http://www.legislation.gov.uk/uksi/2011/625/contents/made).

2. SITE LOCATION

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2.1 Site-centre location [decimal degrees]:

Longitude	Latitude
-2.539	50.619

2.2 Area [ha]:

747.37

2.3 Marine area [%]

68.8

2.4 Sitelength [km]:

0.0

2.5 Administrative region code and name

NUTS level 2 code	Region Name
UKK2	Dorset and Somerset

2.6 Biogeographical Region(s)

Atlantic (100.0 %)

3. ECOLOGICAL INFORMATION

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3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	AIBICID	AIBIC		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	A050	Anas penelope			w	4594	4594	i		G	C		C	
B	A195	Sterna albifrons			r	54	54	p		G	C		C	

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

4. SITE DESCRIPTION

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4.1 General site character

Habitat class	% Cover
N07	2.0
N03	4.0
N02	48.0
N05	46.0
Total Habitat Cover	100

Other Site Characteristics

1 Terrestrial: Soil & Geology: peat,nutrient-rich,sedimentary,shingle 2 Terrestrial: Geomorphology and landscape: lowland,coastal 3 Marine: Geology: chert/flint,pebble,mud,gravel,shingle,clay,sand 4 Marine: Geomorphology: enclosed coast (including embayment),lagoon,intertidal sediments (including sandflat/mudflat),shingle bar,open coast (including bay),barrier beach,subtidal sediments (including sandbank/mudbank)

4.2 Quality and importance

ARTICLE 4.1 QUALIFICATION (79/409/EEC) During the breeding season the area regularly supports: Sternula albifrons - 2.5% of the GB breeding population (5 year mean 1980-1984, 54 pairs). ARTICLE 4.2 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Anas penelope - 1% of the north-west European population (5 year peak mean 1980/81-1984/85, 4594 individuals).

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
H	H02	X	b
H	K03		i
M	G04		b
M	F02		i
M	H04	N	o
H	G01		b
H	I01		b
H	H01	X	o
M	K01		b
M	D05		i
M	F01		b

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]
	G03		o
	D05		b
H	A02		i

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

4.5 Documentation

Conservation Objectives - the Natural England links below provide access to the Conservation Objectives (and other site-related information) for its terrestrial and inshore Natura 2000 sites, including conservation advice packages and supporting documents for European Marine Sites within English waters and for cross-border sites. See also the 'UK Approach' document for more information (link via the JNCC website).

Link(s): http://publications.naturalengland.org.uk/category/6490068894089216

http://publications.naturalengland.org.uk/category/3212324
http://jncc.defra.gov.uk/pdf/Natura2000_StandardDataForm_UKApproach_Dec2015.pdf

http://publications.naturalengland.org.uk/publication/2967759?category=3212324

http://publications.naturalengland.org.uk/publication/6443620974460928?category=5374002071601152

http://publications.naturalengland.org.uk/publication/5436996537286656

5. SITE PROTECTION STATUS (optional)

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5.1 Designation types at national and regional level:

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
UK04	100.0				

6. SITE MANAGEMENT

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6.1 Body(ies) responsible for the site management:

Organisation:	Natural England, Ilchester Estates, Dorset County Council, Weymouth and Portland Borough Council, Southern Inshore Fisheries and Conservation Authority
Address:	
Email:	

Organisation:	Environment Agency, The Crown Estate, Wessex Water, Ministry of Defence, Portland Harbour Authority, The RSPB, Dorset Wildlife Trust
Address:	
Email:	

6.2 Management Plan(s):

An actual management plan does exist:

X	Yes	Name: Chesil and the Fleet European Marine Site Management Scheme 2001 Link: http://publications.naturalengland.org.uk/file/7437307
	No, but in preparation	
	No	

6.3 Conservation measures (optional)

For available information, including on Conservation Objectives, see Section 4.5.

7. MAP OF THE SITES

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INSPIRE ID:

Map delivered as PDF in electronic format (optional)

☐ Yes ☒ No

Reference(s) to the original map used for the digitalisation of the electronic boundaries (optional).

EXPLANATION OF CODES USED IN THE NATURA 2000 STANDARD DATA FORMS

The codes in the table below are also explained in the official European Union guidelines for the Standard Data Form. The relevant corresponding page number is shown in the table below.

1.1 Site type

CODE	DESCRIPTION	PAGE NO
A	SPA (classified Special Protection Area)	53
B	cSAC, SCI or SAC (candidate Special Area of Conservation, Site of Community Importance, designated Special Area of Conservation)	53
C	SPA area/boundary is the same as the cSAC/SCI/SAC i.e. a co-classified/designated site (Note: in the UK Natura 2000 submission, this is only used in Gibraltar)	53

3.1 Habitat representativity

CODE	DESCRIPTION	PAGE NO
A	Excellent representativity	57
B	Good representativity	57
C	Significant representativity	57
D	Non-significant presence	57

3.1 Habitat code

CODE	DESCRIPTION	PAGE NO
1110	Sandbanks which are slightly covered by sea water all the time	57
1130	Estuaries	57
1140	Mudflats and sandflats not covered by seawater at low tide	57
1150	Coastal lagoons	57
1160	Large shallow inlets and bays	57
1170	Reefs	57
1180	Submarine structures made by leaking gases	57
1210	Annual vegetation of drift lines	57
1220	Perennial vegetation of stony banks	57
1230	Vegetated sea cliffs of the Atlantic and Baltic Coasts	57
1310	Salicornia and other annuals colonizing mud and sand	57
1320	Spartina swards (Spartinion maritimae)	57
1330	Atlantic salt meadows (Glauco-Puccinellietalia maritimae)	57
1340	Inland salt meadows	57
1420	Mediterranean and thermo-Atlantic halophilous scrubs (Sarcocornetea fruticosi)	57
2110	Embryonic shifting dunes	57
2120	Shifting dunes along the shoreline with Ammophila arenaria ("white dunes")	57
2130	Fixed coastal dunes with herbaceous vegetation ("grey dunes")	57
2140	Decalcified fixed dunes with Empetrum nigrum	57
2150	Atlantic decalcified fixed dunes (Calluno-Ulicetea)	57
2160	Dunes with Hippophaë rhamnoides	57
2170	Dunes with Salix repens ssp. argentea (Salicion arenariae)	57
2190	Humid dune slacks	57
21A0	Machairs (* in Ireland)	57
2250	Coastal dunes with Juniperus spp.	57
2330	Inland dunes with open Corynephorus and Agrostis grasslands	57
3110	Oligotrophic waters containing very few minerals of sandy plains (Littorelletalia uniflorae)	57
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea	57
3140	Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.	57
3150	Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation	57

CODE	DESCRIPTION	PAGE NO
3160	Natural dystrophic lakes and ponds	57
3170	Mediterranean temporary ponds	57
3180	Turloughs	57
3260	Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation	57
4010	Northern Atlantic wet heaths with Erica tetralix	57
4020	Temperate Atlantic wet heaths with Erica ciliaris and Erica tetralix	57
4030	European dry heaths	57
4040	Dry Atlantic coastal heaths with Erica vagans	57
4060	Alpine and Boreal heaths	57
4080	Sub-Arctic Salix spp. scrub	57
5110	Stable xerothermophilous formations with Buxus sempervirens on rock slopes (Berberidion p.p.)	57
5130	Juniperus communis formations on heaths or calcareous grasslands	57
6130	Calaminarian grasslands of the Violetalia calaminariae	57
6150	Siliceous alpine and boreal grasslands	57
6170	Alpine and subalpine calcareous grasslands	57
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)	57
6230	Species-rich Nardus grasslands, on silicious substrates in mountain areas (and submountain areas in Continental Europe)	57
6410	Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)	57
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels	57
6510	Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)	57
6520	Mountain hay meadows	57
7110	Active raised bogs	57
7120	Degraded raised bogs still capable of natural regeneration	57
7130	Blanket bogs (* if active bog)	57
7140	Transition mires and quaking bogs	57
7150	Depressions on peat substrates of the Rhynchosporion	57
7210	Calcareous fens with Cladium mariscus and species of the Caricion davallianae	57
7220	Petrifying springs with tufa formation (Cratoneurion)	57
7230	Alkaline fens	57
7240	Alpine pioneer formations of the Caricion bicoloris-atrofuscae	57
8110	Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)	57
8120	Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)	57
8210	Calcareous rocky slopes with chasmophytic vegetation	57
8220	Siliceous rocky slopes with chasmophytic vegetation	57
8240	Limestone pavements	57
8310	Caves not open to the public	57
8330	Submerged or partially submerged sea caves	57
9120	Atlantic acidophilous beech forests with Ilex and sometimes also Taxus in the shrublayer (Quercion robori-petraeae or Ilici-Fagenion)	57
9130	Asperulo-Fagetum beech forests	57
9160	Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli	57
9180	Tilio-Acerion forests of slopes, screes and ravines	57
9190	Old acidophilous oak woods with Quercus robur on sandy plains	57
91A0	Old sessile oak woods with Ilex and Blechnum in the British Isles	57
91C0	Caledonian forest	57
91D0	Bog woodland	57
91E0	Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	57
91J0	Taxus baccata woods of the British Isles	57

3.1 Relative surface

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	58
B	> 2%-15%	58
C	≤ 2%	58

3.1 Degree of conservation

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	59
B	Good conservation	59
C	Average or reduced conservation	59

3.1 Global assessment

CODE	DESCRIPTION	PAGE NO
A	Excellent value	59
B	Good value	59
C	Significant value	59

3.2 Population (abbreviated to 'Pop.' in data form)

CODE	DESCRIPTION	PAGE NO
A	> 15%-100%	62
B	> 2%-15%	62
C	≤ 2%	62
D	Non-significant population	62

3.2 Degree of conservation (abbreviated to 'Con.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent conservation	63
B	Good conservation	63
C	Average or reduced conservation	63

3.2 Isolation (abbreviated to 'Iso.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Population (almost) Isolated	63
B	Population not-isolated, but on margins of area of distribution	63
C	Population not-isolated within extended distribution range	63

3.2 Global assessment (abbreviated to 'Glo.' or 'G.' in data form)

CODE	DESCRIPTION	PAGE NO
A	Excellent value	63
B	Good value	63
C	Significant value	63

3.3 Assemblages types

CODE	DESCRIPTION	PAGE NO
WATR	Non-breeding waterbird assemblage	UK specific code
SBA	Breeding seabird assemblage	UK specific code
BBA	Breeding bird assemblage (applies only to sites classified pre 2000)	UK specific code

4.1 Habitat class code

CODE	DESCRIPTION	PAGE NO
N01	Marine areas, Sea inlets	65
N02	Tidal rivers, Estuaries, Mud flats, Sand flats, Lagoons (including saltwork basins)	65
N03	Salt marshes, Salt pastures, Salt steppes	65
N04	Coastal sand dunes, Sand beaches, Machair	65
N05	Shingle, Sea cliffs, Islets	65
N06	Inland water bodies (Standing water, Running water)	65
N07	Bogs, Marshes, Water fringed vegetation, Fens	65
N08	Heath, Scrub, Maquis and Garrigue, Phygrana	65
N09	Dry grassland, Steppes	65
N10	Humid grassland, Mesophile grassland	65
N11	Alpine and sub-Alpine grassland	65
N14	Improved grassland	65
N15	Other arable land	65
N16	Broad-leaved deciduous woodland	65
N17	Coniferous woodland	65
N19	Mixed woodland	65
N21	Non-forest areas cultivated with woody plants (including Orchards, groves, Vineyards, Dehesas)	65
N22	Inland rocks, Screes, Sands, Permanent Snow and ice	65
N23	Other land (including Towns, Villages, Roads, Waste places, Mines, Industrial sites)	65
N25	Grassland and scrub habitats (general)	65
N26	Woodland habitats (general)	65

4.3 Threats code

CODE	DESCRIPTION	PAGE NO
A01	Cultivation	65
A02	Modification of cultivation practices	65
A03	Mowing / cutting of grassland	65
A04	Grazing	65
A05	Livestock farming and animal breeding (without grazing)	65
A06	Annual and perennial non-timber crops	65
A07	Use of biocides, hormones and chemicals	65
A08	Fertilisation	65
A10	Restructuring agricultural land holding	65
A11	Agriculture activities not referred to above	65
B01	Forest planting on open ground	65
B02	Forest and Plantation management & use	65
B03	Forest exploitation without replanting or natural regrowth	65
B04	Use of biocides, hormones and chemicals (forestry)	65
B06	Grazing in forests/ woodland	65
B07	Forestry activities not referred to above	65
C01	Mining and quarrying	65
C02	Exploration and extraction of oil or gas	65
C03	Renewable abiotic energy use	65
D01	Roads, paths and railroads	65
D02	Utility and service lines	65
D03	Shipping lanes, ports, marine constructions	65
D04	Airports, flightpaths	65
D05	Improved access to site	65
E01	Urbanised areas, human habitation	65
E02	Industrial or commercial areas	65

CODE	DESCRIPTION	PAGE NO
E03	Discharges	65
E04	Structures, buildings in the landscape	65
E06	Other urbanisation, industrial and similar activities	65
F01	Marine and Freshwater Aquaculture	65
F02	Fishing and harvesting aquatic resources	65
F03	Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	65
F04	Taking / Removal of terrestrial plants, general	65
F05	Illegal taking/ removal of marine fauna	65
F06	Hunting, fishing or collecting activities not referred to above	65
G01	Outdoor sports and leisure activities, recreational activities	65
G02	Sport and leisure structures	65
G03	Interpretative centres	65
G04	Military use and civil unrest	65
G05	Other human intrusions and disturbances	65
H01	Pollution to surface waters (limnic & terrestrial, marine & brackish)	65
H02	Pollution to groundwater (point sources and diffuse sources)	65
H03	Marine water pollution	65
H04	Air pollution, air-borne pollutants	65
H05	Soil pollution and solid waste (excluding discharges)	65
H06	Excess energy	65
H07	Other forms of pollution	65
I01	Invasive non-native species	65
I02	Problematic native species	65
I03	Introduced genetic material, GMO	65
J01	Fire and fire suppression	65
J02	Human induced changes in hydraulic conditions	65
J03	Other ecosystem modifications	65
K01	Abiotic (slow) natural processes	65
K02	Biocenotic evolution, succession	65
K03	Interspecific faunal relations	65
K04	Interspecific floral relations	65
K05	Reduced fecundity/ genetic depression	65
L05	Collapse of terrain, landslide	65
L07	Storm, cyclone	65
L08	Inundation (natural processes)	65
L10	Other natural catastrophes	65
M01	Changes in abiotic conditions	65
M02	Changes in biotic conditions	65
U	Unknown threat or pressure	65
XO	Threats and pressures from outside the Member State	65

5.1 Designation type codes

CODE	DESCRIPTION	PAGE NO
UK00	No Protection Status	67
UK01	National Nature Reserve	67
UK04	Site of Special Scientific Interest (UK)	67
UK05	Marine Conservation Zone	67
UK06	Nature Conservation Marine Protected Area	67
UK86	Special Area (Channel Islands)	67
UK98	Area of Special Scientific Interest (NI)	67
IN00	Ramsar Convention site	67
IN08	Special Protection Area (SPA, EC Birds Directive)	67
IN09	Special Area of Conservation (SAC, EC Habitats Directive)	67

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CHESIL BEACH AND THE FLEET, DORSET

Chesil Beach is one of the five largest shingle beaches in Britain and is of international interest both as a rare habitat and as a unique physiographic feature. It is the largest shingle tombolo in the Country; comprising a simple, linear shingle storm beach linking the Isle of Portland to the mainland.

The shingle provides nesting habitat for up to 100 pairs of Little Terns (Sterna albifrons) comprising c.5% of the British breeding population. It is also an important site for Common Tern (Sterna hirundo) (c. 65 pairs) and Ringed Plover (Charadrius histicula) (c. 50 pairs).

The small pebblebed shingle in the west is well vegetated in parts and has a very rich flora; including local species like sea-kale (Crambe maritima), Yellow Horned-poppy (Glaucium flavum), Sea Pea (Lathyrus japonicus), Shrubby Sea-blite (Suaeda fruticosa) and Rough Clover (Trifolium scabrum): plants that are characteristic of unstable shingle.

It is the only British locality for the Wingless Cricket (Hogoplistes squamiger).

The Fleet is the largest regularly-tidal lagoon in Britain; which with fresh-water stream inputs, gives rise to saline/brackish conditions. The bed of the Fleet shows unusual transitional habitats between the claybotton deposits and shingle substrate. The flora contains the most extensive mixed population of Eelgrasses (Zostera spp) in Britain, the very local Spiral Tasselweed (Ruppia spiralis), a rare stonewort (Chara sp) and diverse marine algal assemblages. "The section of the Fleet from the Narrows east to Small Mouth has a dominant marine influence with very rich communities including several species rarely recorded within the British Isles - notably the sponge, Suberites massa and goby Gobius couchi (both recorded in only two other localities in Britain), the burrowing anemone, Scolanthus callimorphus (type locality in Portland Harbour and recorded on West coast of Ireland) and the polychaete Sabella flabellata."

The Fleet is notable for the diversity of waders and wildfowl in winter. In particular it regularly supports at least 1% of the north-west European population of Wigeon (Anas penelope) with up to 7,000 birds being recorded in recent years. Good numbers of Pochard (Aythya ferina), Teal (Anas crecca), Pintail (Anas acuta), Mallard (Anas platyrhynchos), Shoveler (Anas clypeata), Tufted Duck (Aythya fuligula) and Goldeneye (Bucephala clangula) are also present.

The site supports the largest resident Mute Swan (Cygnus olor) population in Britain (1000 + birds) which predominantly graze the Zostera beds. Some 30-40 pairs breed.

In recent years, Dark-bellied Brent Geese (Branta bernicula) have begun to over-winter.

This citation / map relates to a site entered in the Register of European sites for Great Britain.
Register reference number UK0011009
Date of registration 30 JAN 1996
Signed [redacted]
on behalf of the Secretary of State for the Environment

EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora

Citation for Special Area of Conservation (SAC)

Name:	Chesil and the Fleet
Unitary Authority/County:	Dorset
SAC status:	Designated on 1 April 2005
Grid reference:	SY630795
SAC EU code:	UK0017076
Area (ha):	1631.63
Component SSSI:	Chesil Beach and The Fleet SSSI, Portland Harbour Shore SSSI, West Dorset Coast SSSI

Site description:

The Fleet is the largest example of a lagoonal habitat in England and has features of both lagoonal inlets and percolation lagoons. It is bordered by the fossil shingle barrier beach structure of Chesil Beach, through which sea water percolates into the lagoon, but most of its water exchange occurs through the narrow channel that links it to Portland Harbour. A low freshwater input produces fully saline conditions throughout most of the Fleet, with reduced salinity occurring only in the west. The lagoon is extremely sheltered from wave action and has weak tidal streams, except in the eastern narrows and entrance channel. The tidal range is much smaller and temperature range far greater than on the open coast. The lagoon supports extensive populations of two species of eelgrass *Zostera* and three species of tasselweed *Ruppia*, including the rare spiral tasselweed *R. cirrhosa*, and a diverse fauna that includes a number of nationally rare and scarce species.

The 28 km-long shingle bar of Chesil Beach, with the contiguous Portland Harbour shore, is an extensive representative of perennial vegetation of stony banks, and most of it is relatively undisturbed by human activities. Much of the shingle bar is subject to wash-over and percolation in storm conditions and is therefore sparsely vegetated. It supports the most extensive occurrences of the rare sea-kale *Crambe maritima* and sea pea *Lathyrus japonicus* in the UK, together with other grassland and lichen-rich shingle plant communities typical of more stable conditions, especially towards the eastern end of the site. The inner shore of the beach supports extensive drift-line vegetation dominated by sea beet *Beta vulgaris* ssp. *maritima* and orache *Atriplex* spp. This community exists in a dynamic equilibrium with Mediterranean saltmarsh scrub, which it replaces in areas subject to disturbance, and is in turn displaced by the scrub after disturbance ceases.

Mediterranean saltmarsh scrub occurs as a band of shrubby sea-blite *Suaeda vera* and sea-purslane *Atriplex portulacoides.* The largest extent of this community lines much of the 13 km length of the seaward margin of the Fleet. The community forms a clear zone between the Fleet and the shingle vegetation of Chesil Bank.

Qualifying habitats: The site is designated under **article 4(4)** of the Directive (92/43/EEC) as it hosts the following habitats listed in Annex I:

- Coastal lagoons*
- Annual vegetation of drift lines
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*)
- Mediterranean and thermo-Atlantic halophilous scrubs (*Sarcocornetea fruticosi*). (Mediterranean saltmarsh scrub)
- Perennial vegetation of stony banks. (Coastal shingle vegetation outside the reach of waves)

Annex I priority habitats are denoted by an asterisk (*).

This citation relates to a site entered in the Register of European Sites for Great Britain.
Register reference number: UK0017076
Date of registration: 14 June 2005
Signed: [redacted]
On behalf of the Secretary of State for Environment, Food and Rural Affairs

Appendix 2: DERC report

A. SAC features, Isle of Portland to Studland Cliffs SAC

1. LOWER PLANTS

i). Bryophyte assemblage with comprising species with a Mediterranean distribution

Due to its southerly position and largely frost-free climate Portland supports many plants, bryophytes and lichens that show a Mediterranean or Southern Oceanic distribution as defined by Hill & Preston (1998). At present 41 bryophytes fall within these categories, 11 of these (Table 1) are Red Listed or Nationally Scarce, with a further 6 that are important at a regional or county level. 5 species, 3 mosses and 2 liverworts are on Section 41 of the NERC Act (2006) as species of Principal Conservation Importance in England.

Within the AoS there is only limited habitat for many of the species on the list with main populations found on the eastern undercliffs from King's Pier south to Freshwater Bay. Two Section 41 and Red Listed liverworts have been recorded from the AoS. ***Cephaloziella baumgartneri*** (S41, EN) was found overgrowing a large limestone boulder on Verne Common (SSSI Unit 33) in 1997. ***Southbya nigrella*** (S41, VU) was found growing on the same boulder as the *Cephaloziella* in 1997 and in 2010 a small population was found in a small area of scree GR SY69517375. Within the SAC *Cephaloziella baumgartneri* is found in around ten sites, mainly on the eastern undercliffs with one site in King Barrow Quarries, *Southbya nigrella* is known from twelve sites and often occurs with *C. baumgartneri* in open limestone grassland. Both species are found a little more widely within the SSSI in the abandoned quarries with sites in Bowers, Trade and Tout Quarries and west of Admiralty Quarries. Both these liverworts are confined in Dorset to the Isle of Portland, and also have their UK strongholds here with c. >50% of British population of *C. baumgartneri* and >90% of *Southbya nigrella* are found on the Island. The small acrocarpous moss *Pleurochaete squarrosa* has been recorded from open grassland between High Angle Battery and the Verne. There are three other recent records from Portland and it is also known from the Hamm Beach.

TABLE 1. Key bryophytes exhibiting an Oceanic or Mediterranean-Atlantic distribution

Species	Element	Status
Acaulon triquetrum	Submediterranean-Subatlantic	S41; EN; NR
Bryum canariense	Mediterranean-Atlantic	NS
Bryum torquescens	Mediterranean-Atlantic	NS
Cephaloziella baumgartneri	Mediterranean-Atlantic	S41; EN; NR
Cololejeunea rossettiana	Submediterranean-Subatlantic	NS
Eurhynchium meridionale	Mediterranean-Atlantic	VU
Funaria pulchella	Submediterranean-Subatlantic	S41; NT; NS
Grimmia orbicularis	Submediterranean-Subatlantic	
Gymnostomum viridulum	Mediterranean-Atlantic	NS
Leptodon smithii	Mediterranean-Atlantic	RR

Species	Element	Status
Marchesinia mackaii	Oceanic Southern-temperate	RR
Plagiochila killarniensis	Hyperoceanic Southern-temperate	RR
Pleurochaete squarrosa	Submediterranean-Subatlantic	NS
Porella arboris-vitae	Submediterranean-Subatlantic	DR
Porella obtusata	Oceanic Southern-temperate	RR
Pterogonium gracile	Submediterranean-Subatlantic	RR
Southbya nigrella	Mediterranean-Atlantic	S41; VU; NR
Weissia condensa	Submediterranean-Subatlantic	S41; NT

MAP 1. Location of bryophytes with a Mediterranean distribution

Red Line = Area of Search (AoS) **Blue hatch = SAC** **Blue line = SSSI**

● = Location of feature

ii). Terricolous and saxicolous lichens considered to be characteristic and preferential to the following NVC Communities; W21, W22, CG1, CG3, CG4, MC1, MC5, MC8 and MC11.

The NVC communities listed above are all notified features of the Isle of Portland SSSI. Of these the maritime communities **MC1**, **MC5**, **MC8** and **MC11** are better developed on the coastlines in the southern half of the Island and are largely absent from the AoS. Calcareous (limestone) grasslands, **CG1**, **CG3** and **CG4**, are widespread across the Island in and around abandoned quarries, remnants of the old common at the Bill and Verne and on the wide undercliffs. **CG3** is by far the most abundant and occurs within the AoS on the slopes around the Verne and High Angle Battery. **CG1** and **CG4** are both much more local with the SSSI and SAC and are not known to occur within the AoS, although very small fragments of **CG1** occur just outside in King Barrow Quarries and east of Admiralty Quarry within Nicodemus Height's SSSI. Of the three limestone grasslands **CG1** is by far the most important for lower plants providing a habitat for several of key Mediterranean bryophytes and lichens particularly the S41 species ***Cephaloziella baumgartneri*** (S41, EN), ***Southbya nigrella*** (S41, VU) and ***Biatorella fossarum*** (S41, EN). The two liverworts are discussed in detail above. The terricolous lichen *Biatorella fossarum* is currently known from only four sites in Britain with Portland supporting the largest populations. Within the AoS it has been at High Angle Battery (SSSI Unit 54) in 2008 on limestone soil along a path. It has also been found just outside the AoS in King Barrow and Tout Quarries. Within the SAC it has been recorded from several sites on the eastern undercliffs from East Weare south to Duncecroft Quarries, and inland in King Barrow Quarries at High Angle Batteries, and at the only other known site in Dorset off of Portland from the undercliff at Emmetts Hill, Purbeck. The S41 lichen *Toninia sedifolia* has been recorded just outside the AoS in King Barrow Quarries, and has its best Dorset populations on Portland in the stands of CG1 grassland.

Scrub (**W21** and **W22**) is locally abundant on the eastern undercliffs and becomes almost dominant in the northern part of East Weare (SSSI Unit 34) and around to Verne Common (SSSI Unit 33). While there has always been an element of scrub in these areas it has increased in both area and density over the last 75 years (Edwards, 2016). The more mature shrubs of Blackthorn and Hawthorn in the more sheltered areas of Units 33 and 34 support a good range of epiphytic lichens which are typical of coastal scrub in southwest Britain. Of particular note are the two beard-lichens *Usnea articulata* and *U. esperantiana*, both of which are very sensitive to atmospheric pollution. ***Usnea articulata*** (S41, NT) was found on a large Blackthorn bush on Verne Common in 2008. This is the only known site on Portland and elsewhere in Dorset it mostly found on mature shrubs and in the canopy of woodland trees in the west of the county where it can be locally frequent. ***Usnea esperantiana*** (NT) was found on Blackthorn twigs in the western part of Verne Common in 2016. This is the only known site on Portland and in Dorset it is currently known from six other sites in the county but may be under-recorded due to past confusion with other *Usnea* species. Neither species has been recorded within the Isle of Portland to Studland Cliffs SAC, though suitable habitat for *U. esperantiana* is present.

MAP 2. Location of key lichens associated with particular NVC communities

Interest feature: ● = Terricolous lichens associated with open limestone grassland

● = Epiphytic lichens associated with wind-pruned coastal scrub (W21 & W22)

iii). Any of the 16 Red Data Book, 2 Nationally Rare and 39 Nationally Scarce lichens associated with coastal limestone and chert

The Isle of Portland is of national, and possibly international, importance for the lichen assemblages associated with limestone and maritime chert. The eastern undercliffs, especially between Church Ope Cove and Durdle Pier, are particularly rich but the interest extends locally into some of the abandoned quarries. There is very little of this habitat the slopes within Unit 33 is mainly over Kimmeridge Clay and lack the boulders that key to the assemblage. The area is now mainly scrub which shades the few boulders and rock outcrops that are there.

The two species found within the AoS are ***Diploschistes gypsaceus*** (NS) and ***Placidium pilosellum*** (NT) which are found on the large boulders above the huts on West Weare. *Diploschistes gypasaceus* is a very scarce lichen of shaded and sheltered hard limestone found in scattered sites north to central Scotland, but in southern England is only known from a few sites. In Dorset the only recent records are from Portland in sheltered ravines in long abandoned quarries and on the vertical sides of boulders on the undercliffs. Other sites within the SAC include screes below Grove and boulders near Durdle Pier both on the eastern undercliffs. *Placidium pilosellum* grows on highly calcareous or basic soils and is found in scattered sites mainly on the western side of the British Isles. In southern England it is uncommon with a few sites on chalk, limestone and basic sand dunes. In Dorset it is known from Portland overgrowing thin limestone soils on boulders and rock outcrops on the undercliffs and abandoned quarries and from chalk cliffs near Swanage. Other sites within the SAC include East Weare and near Durdle Pier, and the only Dorset site off of Portland at Ballard Cliff, Swanage.

MAP 3. Location of Red Listed, Nationally Rare and Nationally Scarce lichens associated with coastal limestone and chert

2. BUTTERFLIES

Records of either of the following butterflies occur with the proposed defined area of search: Lulworth skipper and Adonis blue

Lulworth Skipper *Thymelicus acteon* (S41, NT) is currently confined in Britain to the Dorset coast between Portland and Swanage (Ballard Down); there is an outlying colony to the west near Burton Bradstock. The caterpillars feed on Tor-grass *Brachypodium pinnatum* agg. which is abundant along the Dorset coast on chalk, limestone and occasionally calcareous clay, taller swards 20-50cm in height are preferred. On Portland it is a relatively recent addition (1980s) becoming established first in the south of the Island but has spread widely where Tor-grass is abundant. Within the AoS it has been recorded from Verne Common (SSSI Unit 33) and High Angle Batteries (SSSI Unit 54) with several other colonies just to the south of the AoS boundary. The Isle of Portland to Studland Cliffs will support many colonies also particularly between White Nothe and Gad Cliff, and the majority of colonies are found within the four SSSIs, Isle of Portland, South Dorset Coast Purbeck Ridge East and Purbeck Ridge West.

Adonis Blue *Polyommatus bellargus* (NT) is a specialist butterfly of short, south-facing chalk and limestone grassland where there is an abundance of the larval foodplant Horseshoe Vetch *Hippocrepis comosa*. Despite the abundance of Horseshoe Vetch Adonis Blue is very local on Portland for reasons that are unclear, although the swards are generally taller than on the typical downland sites further inland in Dorset. There are colonies scattered throughout the Island, the largest seem to be in the centre and north at High Angle Batteries, Penn's Weare and Tout Quarries. Within the AoS there are recent records from the slopes east of the Verne including the Verne Moat (SSSI Unit 52) and from High Angle Batteries (SSSI Unit 54), with other just to the south of the AoS boundary in King Barrow and Tout Quarries. Dorset is a UK stronghold for Adonis Blue where it is widespread inland on the chalk and on the coastal chalk and limestone. Within the Isle of Portland to Studland Cliffs SAC there are important colonies around Lulworth and on Ballard Down.

MAP 4. Location of key butterflies: Adonis Blue & Lulworth Skipper

Interest feature: ● = Adonis Blue *Polyommatus bellargus*

● = Lulworth Skipper *Thymelicus acteon*

B. Isle of Portland SSSI interest features

i). LOWER PLANTS

Presence of any of the following lower plant species within the AoS:
***Eurhynchium meridionale*, *Southbya nigrella*, *Roccella phycopsis*, *Arthonia endlicheri*, *Dirina repanda*, *Lecanactis grumulosa*, *Sclerophyton circumscriptum* and *Caloplaca granulosa*. Any species from genus: *Caloplaca*, *Verrucaria* and *Collema*.**

The species above are listed on the Isle of Portland SSSI Citation sheet and form part of the 'Lichen assemblage' and 'Bryophyte assemblage' both notified features of the SSSI. The first two are bryophytes of which only ***Southbya nigrella*** (S41, VU) has been recorded from the AoS, recorded from a large limestone boulder on Verne Common (SSSI Unit 33) in 1997, and from a small area of sheltered scree above East Weare Camp (SSSI Unit 34) in 2010. Its wider distribution has been discussed in more detail above. The six named lichens are all with limestone and chert rocks, particularly boulders on the eastern undercliffs and are found south of the AoS and have not been recorded any nearer than Folly Pier or Grove Point. Lichens of the genera *Caloplaca*, *Verrucaria* and *Collema* are widespread on limestone rocks, both natural outcrops on the undercliffs and 'man-made' quarry ravines. Many of the species are widespread and found throughout the Island suitable habitats. The most notable species are *Collema fragile* (S41; VU) and *C. polycarpon* (NS). Both are not found within the AoS and occur to the south on the eastern undercliffs near Grove Point. *Caloplaca maritima* and *C. ochracea* are both Nationally Scarce but have not been recorded within the AoS the nearest site near Grove Point on East Weare.

The Verne area has had less survey work for lower plants compared with the undercliffs and quarries and suitable habitat for some of these species may be present within the AoS within areas such as the Verne 'moat'.

ii). INVERTEBRATES

Presence of any of the following invertebrate species within the AoS: *Truncatellina britannica*, *Helica itala*, *Polyommatus coridon*, *Polyommatus bellargus*, *Plebejus argus*, *Sterrha degeneraria*, *Tyta lactuosa*, *Ectobius panzeri* and *Platycleis denticulata*.

Portland is a key site for butterflies in Southern England and supports a very wide range of other invertebrates with many rare and scarce species present. Within the AoS much of the land has a northerly aspect or is dense scrub and therefore does not provide optimum habitats for invertebrates, therefore areas on the southern side of the Verne and around High Angle Batteries has most interest including colonies of key butterflies. The neighbouring abandoned quarries at Tout and King Barrow just outside the AoS are some of the most important sites for butterflies on the Island. **Adonis blue *Polyommatus bellargus*** (NT) and **Silver-studded Blue *Plebejus argus*** (S41, VU) are both notified features of the Isle of Portland SSSI as is an 'invertebrate assemblage', which will include a range of Red Listed, Nationally Scarce and locally rare taxa and includes the **Chalk Hill Blue *Polyommatus coridon*** (NT). All three species have been recorded from the AoS at High Angle Batteries (SSSI Unit 54) which is one of key butterfly sites on the Island. Adonis Blue and Chalk Hill Blue have also been recorded from the slopes around Verne (SSSI Units 51 & 52). On Portland Chalk Hill Blue is the most frequent of the three with sites scattered through the middle and north of the Island with some very large colonies present, especially on the eastern undercliffs around Church Ope Cove. Chalk Hill Blue is declining inland in Dorset for reasons that are not fully known, it is probably extinct on the chalk downs west of Dorchester and the main colonies are now on the northeast chalk. The Portland colonies are therefore of considerable importance within the county.

Silver-studded Blue has declined significantly and is only known now from less than 10 colonies the main ones at Broadcroft Quarries and near Nicodemus Knob, with smaller ones at High Angle Batteries, King Barrow Quarries and Tout Quarries. This limestone form of the Silver-studded Blue in not known elsewhere in Dorset, the main form being confined to the Poole Basin heaths.

Moths are very well recorded thanks to the nightly traps set out by Portland Bird Observatory and others. Recording is much patchier than butterflies and the middle and southern part of the Island. Of the two moths listed above only **Portland Ribbon Wave *Idaea degeneraria*** has been recorded within or near the AoS. It feeds on various herbaceous plants including Bramble *Rubus fruticosus* on scrubby undercliffs and as a breeding resident in Britain it is confined to Portland and Purbeck. On Portland it is known to be resident on the undercliffs, particularly on the eastern side. Within the AoS it has been recorded from a moth trap at Fortuneswell and from just outside on the West Weare.

Grey Bush-cricket *Platycleis albopunctata* is a warmth-loving species confined to coastal areas of southern England. It is widespread all along the Dorset coast but is typically found within 50-100 metres of the cliff top. Due to its mild climate and the shelter afforded by the old quarries it is found

throughout Portland in suitable habitat, which is typically calcareous grassland with pockets of bare ground and scattered low scrub. The only record within the AoS, is from 'Castletown' with no other details. The species is likely to occur elsewhere particularly on the southerly aspects of Verne slopes above Tillycombe. There are more records just outside the AoS with Tout and King Barrow Quarries. **Lesser Cockroach *Ectobius panzeri*** is one of three native cockroaches all of which are local or scarce and found mainly in Southern England and are often coastal. *E. panzeri* is the most frequent species in Dorset and is widespread on Portland and the Purbeck coast but very local elsewhere. It is found in warm, open often stony habitats on cliff tops, undercliffs and shingle, or inland on heaths and chalk grassland. On Portland it is mainly found in the middle and south of the Island in abandoned quarries or in maritime grassland where it can be found on the flowers of Wild Carrot. There are no from the AoS on the Island, but it has been recorded from the vegetated shingle on the Hamm Beach within Portland Harbour SSSI.

Mollusca are poorly recorded compared to most other invertebrate groups mainly due to a lack of recorders. The two species mentioned above, ***Helicella itala* Heath Snail** and ***Truncatellina callicratis* British Whorl Snail**, are both associated with high quality limestone grassland, the latter is very small (c. 2mm) and found in short turf. There are no records from the AoS, the nearest sites being Tout Quarries for *Truncatellina* and West Weares for *Helicella*.

MAP 6. Location of invertebrate interest features

Interest feature: ● = Key butterflies (Adonis Blue *Polyommatus bellargus*, Chalk Hill Blue *Polyommatus coridon* Silver-studded Blue *Plebejus argus*)

● = Key moths (Portland Ribbon Wave *Idaea degeneraria*)

♦ = Key Orthoptera (Grey bush-cricket *Platycleis albopunctata* & Lesser Cockroach *Ectobius panzeri*)

C. Chesil and the Fleet SAC features

i). Lower plants found within 200m of the Beach Road occurring within NVC communities characteristic of vegetated shingle feature; SD1; SD19; MC5; MC8; SM25

Lichens and bryophytes are not a particularly prominent feature of the vegetated shingle along Chesil Beach and Hamm Beach, but they are found locally, and on the more stable areas of shingle can be abundant. Within the AoS notable species are found in three main area or habitats of the SAC:

a). Chesil Bank – the stabilised sandy-shingle area at Ferrybridge is well vegetated and dominated by Red Fescue *Festuca rubra* and Thrift *Armeria maritima* (**MC8**) with a much more diverse flora in the more open patches (**MC5**) including the uncommon annuals Dune Fescue *Vulpia fasciculata*, Four-leaved Allseed *Polycarpon tetraphyllum* and Sand Cat's-tail *Phleum arenarium*. The pleurocarpous moss *Hypnum cupressiforme* var. lacunosum is abundant and terricolous lichens are present locally particularly *Cladonia rangiformis* and *Peltigera canina*, with smaller quantities of *Cladonia foliacea*, C. *furcata* subsp. *furcata*, *C. pyxidata* and *Peltigera hymenina*. The uncommon *Thelenella muscorum* was found overgrowing the moss *Ceratodon purpureus* in 2009. None of these species are Red Listed or Nationally Scarce.

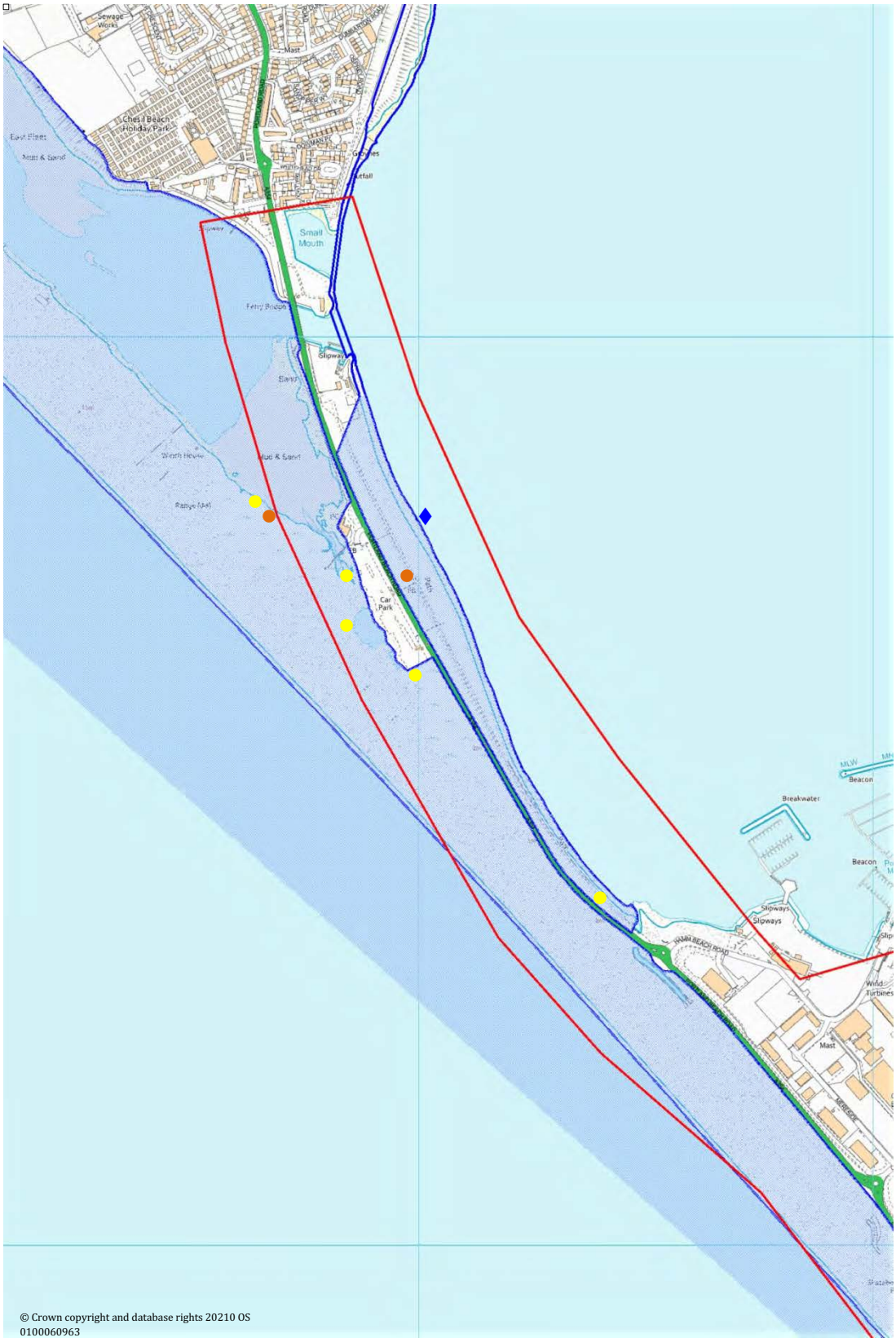
The pebbles around Ferrybridge are generally poor for lichens due to disturbance and the lack of stability, with the common *Xanthoria parietina* the only species found with any frequency. The best areas of stabilised shingle are to the north of the AoS beyond the Tern colony enclosure.

b). Hamm Beach – the more open stands of **MC8** and the few very small stands of **SD19** support the moss *Syntrichia ruralis* var. *ruraliformis* which is typical of more calcareous sand dunes, with *Hypnum cupressiforme* var. *lacunosum* forming extensive patches in places. Most notable is the acrocarpous ***Pleurochaete squarrosa*** (NS) which is found as small scattered patches among the *Syntrichia*. *Pleurochaete* is a moss of open calcareous grassland and is currently known from two sites on Portland with around 15 scattered populations in Dorset in short chalk turf. In Britain it is mainly found in Southern England and the coasts of Wales with outlying populations north to Morecombe Bay.

c). SM25 stands – one of the SAC features are the stands of Shrubby Seablite *Suaeda vera* which fringe the Fleet and saltmarsh areas around Ferrybridge. The common yellow leafy lichen *Xanthoria parietina* is abundant on the older stems, and on closer inspection many stems and twigs support the yellow-orange crust-forming species ***Caloplaca suaedae*** (NT, NR), which was described new to science from specimens collected at Ferrybridge. Within the SAC it is found wherever there are large stands of Shrubby Seablite or very rarely Sea Purslane between Ferrybridge and Abbotsbury, and also on the Hamm Beach towards Osprey Quay. The only other locality in Dorset is from a Shrubby Seablite stand on the southern shore of Poole Harbour. In Britain it is currently only known from saltmarsh-

shingle interfaces in Dorset and North Norfolk, and is thought to be endemic (Smith *et al*, 2009), but may occur in similar habitats in Atlantic and southern Europe.

MAP 7. Location of bryophytes and lichens associated with the vegetated shingle interest



Interest feature: ● = Terricolous bryophytes and lichens associated with sandy shingle (MC5 & MC8)

● = Lichens associated with *Suaeda vera* stands (SM25) (*Caloplaca suaedae*)

♦ = Mollusca associated with shorelines (*Truncatella subcylindrica* & *Paludinella littorina*)

ii). Invertebrates found within the SAC; *Truncatella subcylindrica* and *Paludinella globularis*, and any species associated considered typical of the vegetated shingle habitat

The Fleet and Portland Harbour are noted for their rich marine fauna with many rare and scarce species present. Most are exclusively marine, but the molluscs ***Truncatella subcylindrica*** and ***Paludinella globularis*** (Syn. *P. littorina*) can be found at or above Mean High Water in strandline debris and among saltmarsh plants, both are scarce nationally, although are more widely known within suitable habitat than formerly due to better recording.

There are records of ***Truncatella subcylinderica*** from within the AoS on the shoreline of Portland Harbour at Hamm Beach and the shore of the Fleet at Ferrybridge. Elsewhere in the SAC it is only known from the old salt pans at Grove Point, Portland, and in Dorset there are further sites along the shore of the Fleet and Portland Harbour, plus an unlocalised historical record from the Poole Harbour area.

Paludinella globularis is found in similar habitat and with records from the shore of the Fleet and from Portland Harbour, but there are currently no records from within the AoS. Elsewhere within the SAC it is known the old salt pans at Grove Point and from the shore of West Weare on Portland, with two recent records from Kimmeridge Bay on the Purbeck coast. Apart from these records it also known in Dorset from the shore of the Fleet and Portland Harbour plus an unlocalised historical record from the Poole Harbour area.

Both these molluscs are found along the South Coast from Cornwall to Hampshire with a few records from South Wales. *Truncatella* extends further east to the coast of Sussex, Kent and Essex (NBN Atlas).

Other key invertebrate species

Three species have their sole British location around Ferrybridge, formerly known as Small Mouth Sands.

The darkling beetle ***Omophlus pubescens*** (VU) has long been known from the area the larvae found in the sandy shingle among the roots of Thrift *Armeria maritima* in open vegetation (Alexander *et al*, 2014), recent surveys have only found it in one area to the northwest of the Chesil Centre close to the AoS, there are older records from within the AoS.

Another darlking beetle ***Anthicus tristis*** (VU) was formerly found more widely along the South Coast in sandy habitats close to brackish or saline waters (Alexander *et al*, 2014). The only recent UK records are from Ferrybridge, one from 2014 southeast of Chesil Centre is within the AoS.

The micromoth ***Scythris siccella*** **Least Owlet** (S41) is only known in the UK from Hamm Beach where it is found in sparsely vegetated sandy habitats. The larvae feed on various herbaceous plants making a

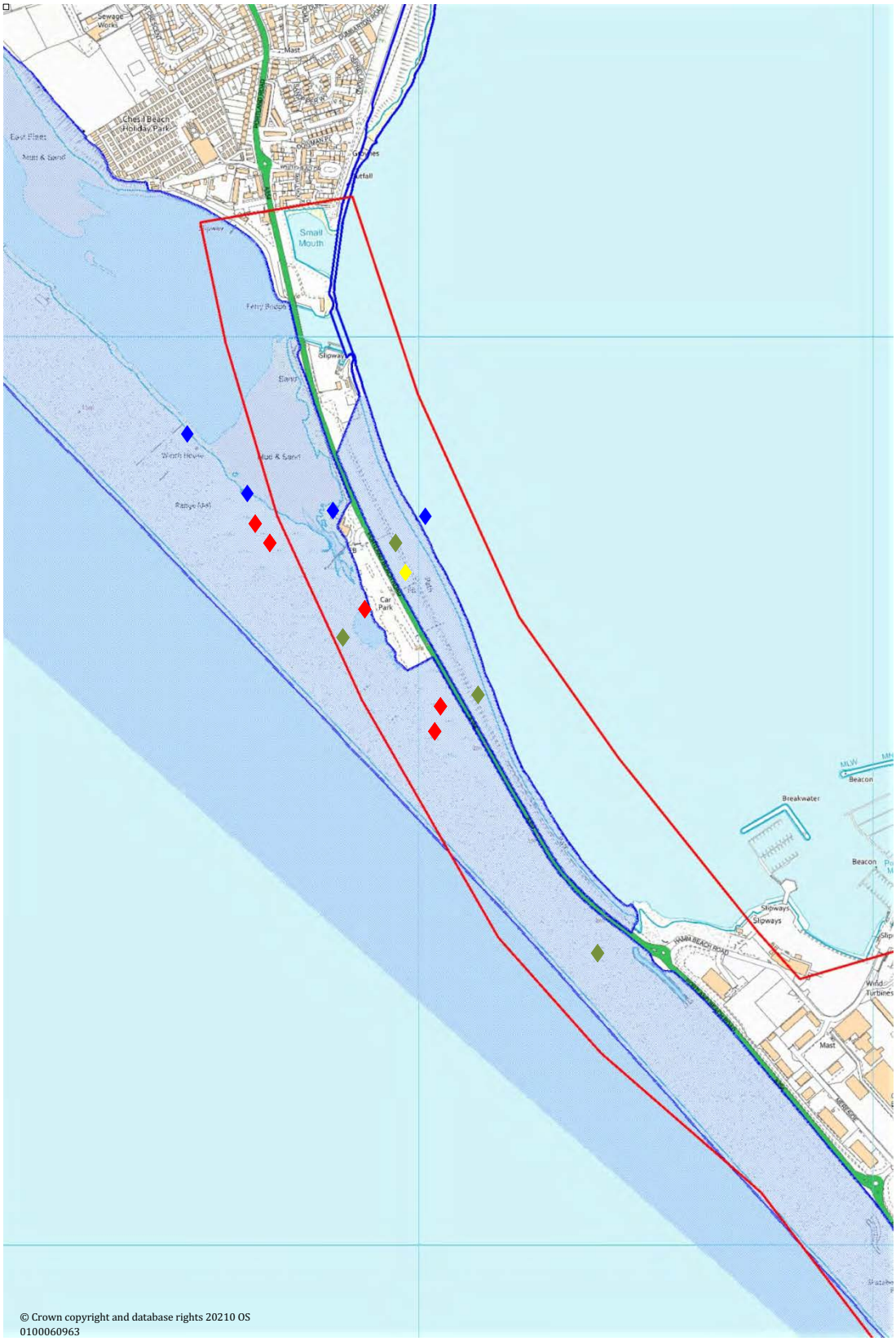
silken tube covered in sand grains down into the sand. Despite recent small-scale management and survey work there have been records of the moth in recent years, however it is too early to say whether the species is extinct or not. The site for this moth is within the AoS.

A well known species from the Ferrybridge area is **Scaly Cricket *Pseudomogoplistes vicentae*** (VU) which is a shingle specialist and is largely nocturnal and hiding under cobbles during the day. Thought to be confined to the Ferrybridge area it has now been found more widely along the Chesil Bank towards Abbotsbury. All Dorset sites are within the Chesil and the Fleet SAC. Apart from Chesil there are currently only two other known sites in Britain at Branscombe in Devon and at Marloes, Pembrokeshire.

***Hylaeus annularis* Shingle Yellow-face Bee** (NR) is a small black bee with yellow face markings confined to vegetated shingle habitats in Britain and is currently known in Britain from a handful of shingle sites from Dorset east to Suffolk. The bee has been found at flowers of Sea Mayweed and Wild Carrot and nest in dead hollow plant stems or in the ground (Else & Edwards, 2018) Within the AoS it has been found by the Chesil Centre and further south on the Chesil side of the road. All confirmed Dorset records are from the Chesil and the Fleet SAC and SSSI.

Phlegra fasciata (NT) is a small jumping spider found in coastal sand dune and sandy shingle sites along the South Coast from Devon to Kent and on the Gower Peninsula in South Wales. In Dorset it has been recorded from Chesil Beach and from Arne and Studland on the southern shore of Poole Harbour. It is uncertain whether the Chesil records are from within the AoS but one is from the Ferrybridge area.

MAP 7. Location of invertebrates associated with vegetated shingle interest feature



Interest feature: ♦= Mollusca associated with shorelines (*Truncatella subcylindrica* & *Paludinella littorina*)
♦= Beetles; *Anthicus tristis* and *Omophlus pubescens*
♦= Micromoth; *Scythris siccella*
♦= Orthoptera; Grey Bush-cricket and Lesser Cockroach

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Appendix 3: Photographs

Photo 1: Roadside mixed Sonchus SD1 community looking south towards Isle of Portland. Note footway between road edge and SAC.

Photo 2: SD1 Arrhenatherum community on raised bank forming edge of road.

Photo 3: SD1 Arrhenatherum community south of Osprey Quay.

Photo 4: Scrub cover in Unit 33 above the Royal Naval cemetery - Isle of Portland to Studland Cliffs SAC.

Photo 5: Scrub cover in Unit 33 looking north towards application site from footpath - Isle of Portland to Studland Cliffs SAC.

Photo 6: Rock samphire establishing on loose shingle within a few metres of footway on A354 adjacent to Osprey Quay.

Photo 7: Sea campion growing on loose shingle within a few metres of footway on A354 adjacent to Osprey Quay.

Photo 8: SD1 Arrhenatherum and mixed Sonchus communities west of A354 and Osprey Quay.

Photo 9: SD1 Arrhenatherum and mixed Sonchus communities west of A354 and Osprey Quay.

Photo 10: SD1 Arrhenatherum and mixed Sonchus communities west of A354 and Osprey Quay.

Photo 11: SD1 Arrhenatherum community at southern end of A354 (north of car park and skate park).

Photo 12: Flood alleviation channel within Chesil and the Fleet SAC.

Photo 13: Area of vegetated coastal shingle present between A354 and flood alleviation channel opposite Osprey Quay.

Photo 14: Evidence of utilities within vegetated coastal shingle habitat within Chesil and the Fleet SAC.

Photo 15: Evidence of utilities within vegetated coastal shingle habitat within Chesil and the Fleet SAC.

Photo 16: Height of road above surrounding habitats (taken from Chesil Beach car park which is outside the SAC).

Photo 17: Height of road above surrounding habitats. Coastal vegetated shingle has formed on banking of road. Rock samphire establishing on loose shingle.

Photo 18: Raised bank formed alongside footway north of Osprey Quay.

Photo 19: MC5 grassland growing on banks of A354 (eastern side of carriageway).

Photo 20: Eastern side of A354 showing MC5 and SM25 habitat occuring between A354 and disused railway bed. SM25 has formed in drainage channel.