

Natura Impact Statement- Information for a Stage 2
(Natura Impact Statement) AA for the proposed SHD at
Coolagad, Greystones, Co. Wicklow.



4th April 2022

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On behalf of: Cairn Homes Properties Ltd.

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Introduction

The following Natura Impact Statement (NIS) has been prepared by **Altemar Ltd.** at the request of Cairn Homes Ltd. The project involves a Strategic Housing Development (SHD) at Coolagad, Greystones, Co. Wicklow of c.26.03ha. The proposed development consists of 586 residential units (351 houses; 203 apartments and 32 duplex units) at a site c. 26.03 ha at Coolagad, Greystones. The development will also include the provision of a community building (392 sqm), a creche, a sport field and a MUGA.

An Appropriate Assessment is an assessment of the potential effects of a proposed project or plan, on its own, or in combination with other plans or projects, on one or more European sites. European sites are those sites designated as Special Areas of Conservation (SAC) or Special Protection Areas (SPA). An AA Screening was carried out for the proposed project and concluded that *"acting on a strictly precautionary basis, an NIS is required in respect of the effects of the project on the Bray Head SAC because it cannot be excluded on the basis of best objective scientific information following screening, in the absence of control or mitigation measures that the plan or project, individually and/or in combination with other plans or projects, will have a significant effect on the named European Site/s."*

This Natura Impact Statement examines whether the project, either alone, or in combination with other plans and projects, in the view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the European sites.

Altemar Ltd.

Since its inception in 2001, Altemar has been delivering ecological and environmental services to a broad range of clients. Operational areas include: residential; infrastructural; renewable; oil & gas; private industry; Local Authorities; EC projects; and, State/semi-State Departments. Bryan Deegan, the managing director of Altemar, is an Environmental Scientist and Marine Biologist with 27 years' experience working in Irish terrestrial and aquatic environments, providing services to the State, Semi-State and industry.

Bryan is currently contracted to Inland Fisheries Ireland as the sole "External Expert" to environmentally assess internal and external projects. He is also chair of an internal IFI working group on environmental assessment. Bryan Deegan (MCIEEM) holds a MSc in Environmental Science, BSc (Hons.) in Applied Marine Biology, NCEA National Diploma in Applied Aquatic Science and a NCEA National Certificate in Science (Aquaculture). Bryan Deegan carried out all elements of this NIS.

Background to the Appropriate Assessment

The Habitats Directive (92/43/EEC), together with the Birds Directive (2009/147/EC), forms the cornerstone of European nature conservation policy. The Directive protects over 1000 animals and plant species and over 200 "habitat types" which are of European importance. In the Directive, Articles 3 to 9 provide the legislative means to protect habitats and species of European Community interest through the establishment and conservation of an EU-wide network of conservation sites (European sites).

These are Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under the Birds Directive. Article 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites (Annex 1.1). Article 6(3) establishes the requirement for Appropriate Assessment:

"Any plan or project not directly connected with or necessary to the management of the [European] site but likely to have a significant effect thereon, either individually or in combination with other plans and projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implication for the site and subject to the provisions of paragraph 4, the component national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public."

Furthermore, as outlined in the EC guidance document on Article 6(4) (January 2007)¹:

“Appropriate assessments of the implications of the plan or project for the site concerned must precede its approval and take into account the cumulative effects which result from the combination of that plan or project with other plans or projects in view of the site's conservation objectives. This implies that all aspects of the plan or project which can, either individually or in combination with other plans or projects, affect those objectives must be identified in the light of the best scientific knowledge in the field.

Assessment procedures of plans or projects likely to affect European sites should guarantee full consideration of all elements contributing to the site integrity and to the overall coherence of the network, both in the definition of the baseline conditions and in the stages leading to identification of potential impacts, mitigation measures and residual impacts. These determine what has to be compensated, both in quality and quantity. Regardless of whether the provisions of Article 6(3) are delivered following existing environmental impact assessment procedures or other specific methods, it must be ensured that:

- *Article 6(3) assessment results allow full traceability of the decisions eventually made, including the selection of alternatives and any imperative reasons of overriding public interest.*
- *The assessment should include all elements contributing to the site's integrity and to the overall coherence of the network as defined in the site's conservation objectives and Standard Data Form, and be based on best available scientific knowledge in the field. The information required should be updated and could include the following issues:*
 - *Structure and function, and the respective role of the site's ecological assets;*
 - *Area, representativity and conservation status of the priority and nonpriority habitats in the site;*
 - *Population size, degree of isolation, ecotype, genetic pool, age class structure, and conservation status of species under Annex II of the Habitats Directive or Annex I of the Birds Directive present in the site;*
 - *Role of the site within the biographical region and in the coherence of the European network; and,*
 - *Any other ecological assets and functions identified in the site.*
- *It should include a comprehensive identification of all the potential impacts of the plan or project likely to be significant on the site, taking into account cumulative impacts and other impacts likely to arise as a result of the combined action of the plan or project under assessment and other plans or projects.*
- *The assessment under Article 6(3) applies the best available techniques and methods, to estimate the extent of the effects of the plan or project on the biological integrity of the site(s) likely to be damaged.*
- *The assessment provides for the incorporation of the most effective mitigation measures into the plan or project concerned, in order to avoid, reduce or even cancel the negative impacts on the site.*
- *The characterisation of the biological integrity and the impact assessment should be based on the best possible indicators specific to the NATURA assets which must also be useful to monitor the plan or project implementation.”*

As outlined the revised Guidance published in October 2021 (EC, 2021) *“in Identifying the Natura 2000 sites that may be affected should be done by taking into consideration all aspects of the plan or project that could have potential effects on any Natura 2000 sites located within the zone of influence of the plan or project. This*

¹ European Commission. (2007). Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission.

should take into account all of the designating features (species, habitat types) that are significantly present on the sites and their conservation objectives. In particular, it should identify:

- any Natura 2000 sites geographically overlapping with any of the actions or aspects of the plan or project in any of its phases, or adjacent to them;*
- any Natura 2000 sites within the likely zone of influence of the plan or project. Natura 2000 sites located in the surroundings of the plan or project (or at some distance) that could still be indirectly affected by aspects of the project, including as regards the use of natural resources (e.g. water) and various types of waste, discharge or emissions of substances or energy;*
- Natura 2000 sites in the surroundings of the plan or project (or at some distance) which host fauna that can move to the project area and then suffer mortality or other impacts (e.g. loss of feeding areas, reduction of home range);*
- Natura 2000 sites whose connectivity or ecological continuity can be affected by the plan or project.*
- The range of Natura 2000 sites to be assessed, i.e. the zone in which impacts from the plan or project may arise, will depend on the nature of the plan or project and the distance at which effects may occur. For Natura 2000 sites located downstream along rivers or wetlands fed by aquifers, it may be that a plan or project can affect water flows, fish migration and so forth, even at a great distance. Emissions of pollutants may also have effects over a long distance.”*

Stage 2: Natura Impact Statement

A Natura Impact Statement (NIS) is Stage 2 of the Appropriate Assessment process. In the case of the proposed residential development at Coolagad, Greystones, Co. Wicklow, acting on a strictly precautionary basis, an NIS is required in respect of the effects of the project on the Bray Head SAC (due to the potential for downstream impacts during construction and operation), because it cannot be excluded on the basis of best objective scientific information, in the absence of control or mitigation measures, following screening that the project, individually and/or in combination with other plans or projects, will have a significant effect on Bray Head SAC.

A Stage 2 Appropriate Assessment or NIS is not required for the effects of the project on all other listed Natura sites within, and sites beyond, 15km because, it can be excluded, on the basis of the best objective scientific information following screening, that the project, individually and/or in combination with other plans or projects, will have not a significant effect on those listed sites.

The NIS evaluates the potential for direct, indirect effects, alone or in combination with other plans and projects having taken into account the use of mitigation measures. The NIS is informed by the accompanying EIAR and Outline CEMP including the proposed mitigation measures that are outlined to reduce the potential effects of the proposed project on species/habitats of conservation importance and the surrounding environment. These mitigation measures are adequate to avoid or reduce adverse effects on the integrity of Bray Head SAC.

Management of the Site

The project is not directly connected with, or necessary to the management of European sites.

Description of the Proposed Project

The proposed development consists of a strategic housing development at this site of c.26.03ha at 'Coolagad', Greystones, Co. Wicklow (7 year permission). The application site is generally located to the west of the R761 Rathdown Road, north of Gate Lodge; north and west of Coolagad House, Temple Carrig School, Gaelscoil na gCloch Liath and Greystones Educate Together National School. The lands are bounded by Waverly Avenue and Seagreen Park residential areas to the east. Templecarrig Lower is located to the north of the lands and Kindlestown Upper to the west.

The proposed development will consist of:

- 586 residential units including:
- 351 two storey houses (207 no. 3 bed, 140 no. 4 bed, 4 no. 5 bed) comprising detached, semi-detached and terraced units
- 203 no. apartments (65 no. 1 bed, 123 no. 2 bed, 15 no. 3 bed) provided within 6 no. blocks ranging from three to four-storey (over basement) with residential amenity facilities .
- 32 no. duplex units within 2 no. three-storey blocks (16 no. 2 bed and 16 no. 3 bed units)
- c. 5,192 sqm of communal open space is provided to serve the proposed apartment/duplex units;
- Community building (single storey) of 392 sq.m. with 29 car parking spaces, including changing rooms and a multipurpose room.
- Creche building of 734 sq.m. with 21 car parking spaces
- A new vehicular entrance, with signalised junction and pedestrian crossings, will be provided off the R761 (Rathdown Road). The new junction will be linked to the existing signalised junction at Blacklion Manor Road / Redford Park which has a planned upgrade by Wicklow County Council. Cycle lanes will be provided along this section of the R761 on both sides. A footpath will also be provided on its western side. Car parking will be provided to the east of the R761, in the front of Redford Cemetery.
- The new access will provide a distributor road as part of the long-term objective to provide a northern access route from Greystones to the N11.
- Car and bicycle parking spaces are provided as follows:
- 702 on curtilage car parking spaces for the houses; 206 car parking spaces at basement level and 5 at surface level for the apartments; and 32 spaces for the duplex units and 10 visitor spaces at surface level;
- 22 motorbike parking spaces;

- 436 resident and 118 visitor bicycle parking spaces are proposed in a mix of basement and surface levels for the apartment blocks and duplex units; 12 bicycle spaces are proposed for the creche, 12 for the community centre and 10 at the sport field.
- The development also includes site development infrastructure, a hierarchy of internal streets including bridges, cycle paths & footpaths; new watermain connection and foul and surface water drainage; the development also provides for the construction of a new public foul sewer along the R761/R762 from the site entrance as far as the R762 in front of St. Kevin's National School, Rathdown Road, Greystones.
- c.10.43ha open space to include a sport field, a MUGA, private, communal and public open spaces incorporating an existing stream, formal and informal play areas, and new boundary treatments.
- ESB substations/switchrooms, lighting, site drainage works and all ancillary site development works above and below ground.

Site context

It should be noted that several springs are located within the subject site and the Greystones Stream traverses the centre of the subject site in an easterly direction, before discharging to the Irish Sea at Greystones North Beach. The proposed development site is located in an area with many hills and slopes, with the terrain falling from 90mOD at the western boundary to 39mOD at the R761 Rathdown Road on the eastern side. Towards the south-western extremity of the site, it reaches a highest point of 95mOD. Most of the land slopes moderately at gradients in the range of 1:12 and 1:15 but there are steeper parts of the site with slopes of up to 1:6 which are located toward the higher side of the southern portion of the site.

Spatial Scope and Zone of Influence

As outlined in CIEEM (2018) *'The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries.'* In line with best practice guidance an initial zone of influence be set at a radius of 2km for non-linear projects (IEA, 1995). As works are proposed in close proximity to multiple springs, watercourses and a public surface water network, which outfall to the marine environment proximate to Bray Head SAC, in the absence of mitigation measures a Bray Head SAC is deemed to be within the potential Zone of Influence (Zol). The Zol of the proposed project would be seen to be restricted to the site outline with potential for localised noise, dust, light impacts during construction, in addition to downstream effects on the marine environment and a European site. Drainage from site, both foul and surface water during construction and operation, would be seen as the outputs, in addition to the watercourses within and adjacent to the site, could potentially extend the potential Zol into the marine environment. As a result, further information is provided in relation to the works on site, the proposed landscape design, the drainage strategy in addition to the flood risk assessment.

Landscape

A Landscape Report was composed by Kevin Fitzpatrick, Landscape Architecture in relation to the proposed development. In relation to the existing landscape characteristics the report states that: *'The aesthetic quality of the existing stream, native hedgerows, trees, marsh area and the steep ground levels are the most important components in defining the landscape character of the site. Other than these elements, the general character of the landscape would be considered that of a traditional agricultural landscape mixed with adjoining developing residential use. In a wider context, the Glen of the Downs and coastal areas would be of a high value landscape character.'*

In relation to the proposed landscape for the development site, the report states that: *'The enhancement and strengthening of existing landscape features throughout the site is a fundamental aspect of the overall landscape approach. The green infrastructure strategy serves to link and integrate all of the spaces within the site together using existing and new landscape elements, while also contributing to green infrastructure in a wider context by creating opportunities to connect to green infrastructure beyond the site boundary.'*

The main method used to enhance green infrastructure links is the retention and strengthening of existing hedgerows and woodland areas. Existing hedgerows provide the opportunity to create green routes through the site, which serve both a recreational and ecological function. Hedgerows increase local biodiversity and create habitats, thus becoming biodiversity corridors which link to other green infrastructure features in the surrounding areas. In addition to this, retaining hedgerows and ditches also allows the prospect of implementing a SuDS network through the site which can integrate into the circulation routes and become a part of the wider green infrastructure strategy.

The stream and associated vegetation is also of high priority. Similar to the treatment of the existing hedgerows, this linear space will become an integral linking feature in the wider green infrastructure strategy. The existing riparian corridor will be enhanced and significantly widened to form the focus on one of the main spaces. The existing wetland marsh will also be increased in size and enhanced to create an important wetland habitat of significant biodiversity value. The stream and wetland form the basis for a SuDS system, with all proposed channels eventually running into the stream. This is expanded upon with ditches and swales that will be created as bioswales adding to the green infrastructure network.'

The proposed landscape masterplan is seen in Figure 5.

Outline Construction Environmental Management Plan

AECOM has been appointed to undertake this Outline Construction Environmental Management Plan (Outline CEMP) and the OCEMP accompanies this submission. This Outline CEMP was reviewed and details included within the NIS where necessary. The Outline CEMP sets out the procedures, standards, work practices and management responsibilities to address potential environmental effects that may arise from the Proposed Development. The Outline CEMP outlines the approach that will be adopted to environmental management throughout the development works at the site, with the primary aim of reducing any adverse effects from construction on the environment.



0 1 2 km

Project: Coolagad
 Location: Greystones, Co. Wicklow
 Date: 17th January 2022
 Drawn By: Bryan Deegan (Altamar)

ALTEMAR
 Marine & Environmental Consultancy

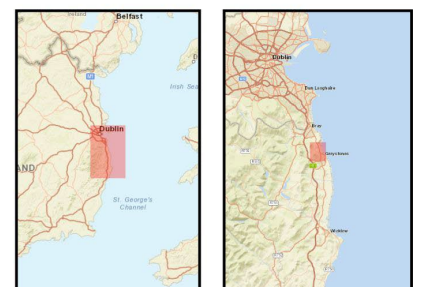


Figure 1. Site context map



Project: Coolagad
 Location: Greystones, Co. Wicklow
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ALTEMAR
 Marine & Environmental Consultancy

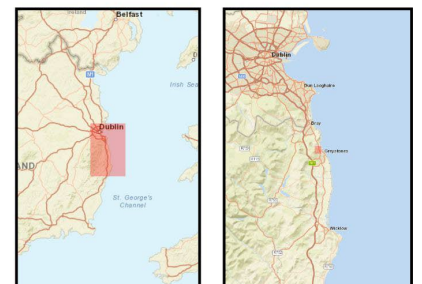


Figure 2. Site outline in red

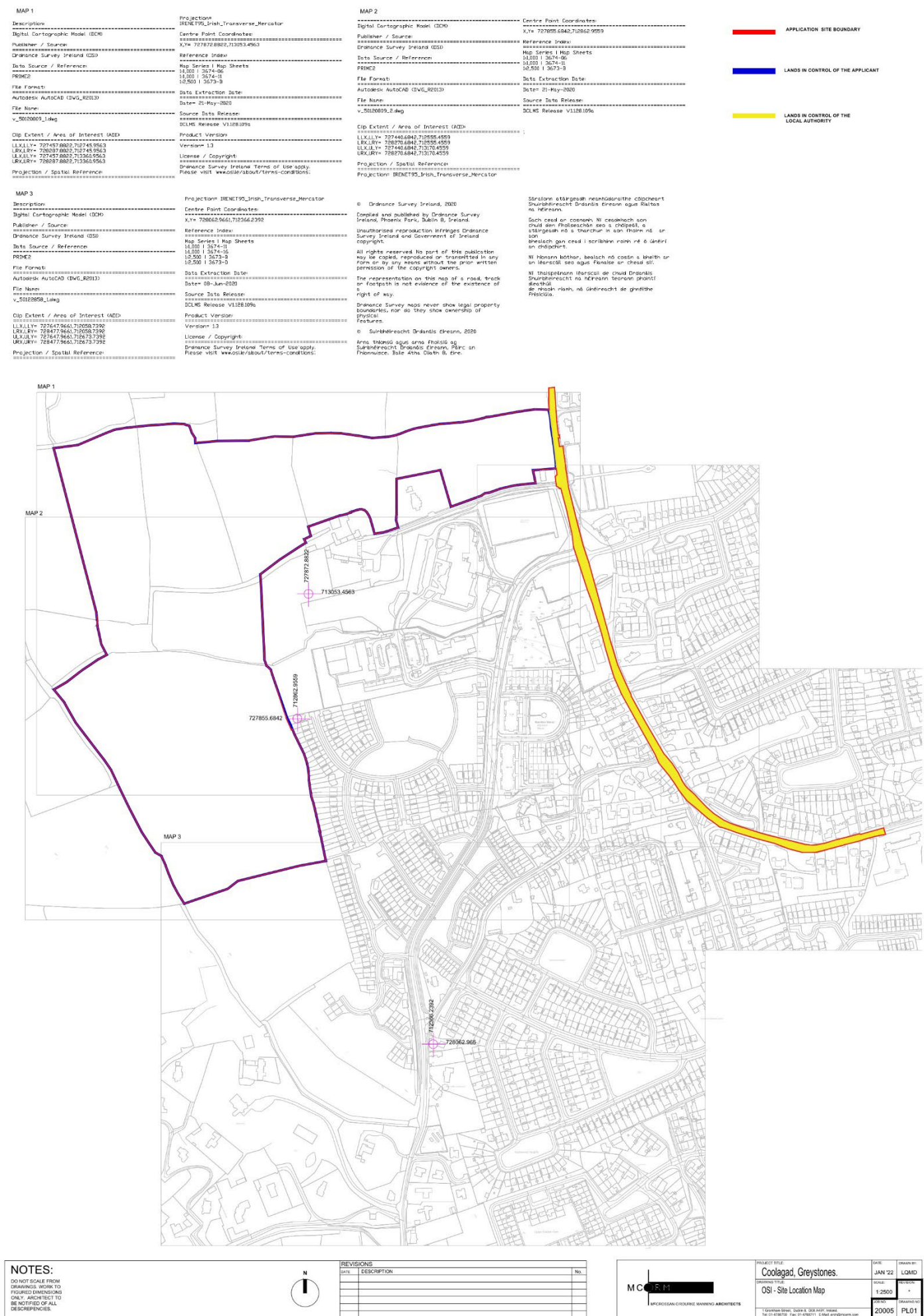


Figure 3. Site location map

Drainage

An Infrastructure Report was composed by AECOM for the Residential Lands at Coolagad, Greystones.

Foul Water

In relation to the existing foul water drainage for the proposed development, the report states that: *'The existing site is greenfield at present and the existing foul drainage infrastructure is located in the R761 as indicated in the services record drawings contained in Appendix M. A Ground Penetration Radar (GPR) was carried out along the R761 (Survey ID MG38901-U), confirming the presence of the existing foul network as per the existing record drawings obtained. Please refer to Appendix M for full map of the existing record drawings obtained.'*

The Irish Water Web Map taken from the Infrastructure Report, which shows the existing drainage network is below (Figure 6).

In relation to the proposed foul water drainage for the proposed development, the report states that: *'AECOM have reviewed the existing foul water network in the area and have identified a new connection location into the existing 375mm combined sewer that flows eastwards in Victoria Road (Figure 16), which is currently flowing towards the existing pumping station. Refer to Figure 3 for the location of the proposed foul water connection. The proposed foul sewers have been designed in accordance with Irish Water's code of Practice for Wastewater Infrastructure and will fall by gravity into the existing 375mm combined sewer via a new 300mm pipe to be laid along the R761 and Victoria Road roadways. The proposed foul network has been modelled using Innovyze Micro drainage software and detailed calculations are enclosed in Appendix N. Refer to AECOM Drawing No. 60641912-ACM-XX-00-DR-CE-10-0501 to 0506 for the proposed drainage layout. The estimated wastewater discharge associated with the proposed development has been based on Irish Water's Code of Practice for Wastewater Infrastructure.'*

The foul water will then be pumped to Greystones Wastewater Treatment Facility where it will be treated and then discharged to the Irish Sea. The person equivalent (PE) organic capacity for Greystones Wastewater Treatment Facility is 40,000². Based on the 2019 Environmental Report the Organic capacity remaining is 15,091 (PE).

Surface Water

In relation to the existing site surface water drainage, the report states the following: *'There are several springs located within the subject site and a stream which originates within the subject site and drains through the centre of the site in an easterly direction.'*

In October 2020, AECOM carried out a site visit to estimate the extent of the existing stream on site and to assess the existing springs onsite. The following was noted:

- *One spring running from the north-west corner of the subject site, flowing eastwards, follows the existing hedgerows located at the northern perimeter, as far as the north-east corner of the development. Due to the high-dense vegetation, it was not possible estimate the direction of the flow beyond this point.*
- *Another spring was identified within the heart of the proposed open space to the north of the site. During the site visit, a high-water table was encountered. The water from the spring is currently flowing eastwards via an existing culvert. It is estimated that the culvert is discharging into an existing surface*

² Greystones Wastewater Treatment Facility- 2019 Environmental Report https://www.water.ie/_uuid/3fa53ead-afa6-4bbe-9fbc-bed2d00d5496/D0010-01_2019_AER.pdf

water manhole prior to discharge to the existing network, but the existing record drawings obtained for the subject area have not identified any surface water network in the area.

Further investigations were carried out on site on the 31st March 2021 by Enviroguide Consulting and further drainage infrastructure has been found within the subject site, as follows:

- A 750mm diameter culvert, approximately 6.1m long, has been identified along the existing stream that flows through the site. The culvert appears to facilitate access between the existing fields either side of the stream and is located approximately 9.9m from the eastern boundary of the subject site.*
- A surface water pipe with an unknown diameter has been identified draining from, what appears to be, a natural depression located in the south eastern corner of the subject site. The pipe drains in a northerly direction discharging into the existing stream, east of the abovementioned 750mm culvert section.*
- There are also 2 no. culverts located in the eastern portion of the site, however their alignment and sizing are unknown. According to a neighbour, one of the culverts drains from within the subject site, at the north eastern corner of the Evans property, and drains in a south easterly direction, traversing the Evans property and back into the subject site, before it exits the subject site again.*

It is understood that the second culvert drains from the site boundary at the north eastern corner of the subject site and drains in a southerly direction, before it exits the subject site approximately 75m east of where the other unknown culvert exits the site. It is believed that this is the culvert which drains the spring located in the north-west corner of the subject site that flows along the existing hedgerow along the northern perimeter of the site.

It is unknown as to whether these 2 no. culverts link up further downstream, however it is worth noting that an existing 450mm diameter surface water pipe has been identified approximately 65m south of this location which may be the outfall.'

In relation to the proposed surface water plans for the subject site, the report states that: 'With no formal existing surface water networks identified within the site area or along the R761 roadway, it is currently proposed to maintain the current flow paths from the site and drain surface water runoff from the proposed development to either the existing stream within the site, a proposed wetland area or the existing underground pipe identified in the Enviroguide survey. Refer AECOM drawing no. 60641912-ACM-XX-00-DR-CE-10-0501 to 0506 for the proposed on-site drainage and discharge locations. AECOM have modelled the proposed on-site surface water drainage network in order to ensure that the discharge will be restricted to the associated greenfield runoff rate and that sufficient attenuation storage will be provided to achieve this.'

The drainage network for the proposed development can be seen in Figures 7-12.

Flood Risk Assessment

AECOM have been appointed by Cairn Homes Properties Ltd. to undertake a Flood Risk Assessment (FRA) for the proposed residential development in Coolagad, Greystones, Wicklow.

In conclusion the report states that: 'The flood risk assessment was prepared for the purposes of assessing the flood risk to the proposed residential development in Coolagad, Greystones. AECOM have reviewed the CFRAM Flood Maps available and noted that no maps were developed for the Coastal Flood Risk that would comprise the subject site. It is also noted that as part of the CFRAM Map Study, 2 No. predicted future scenarios are available for the Greystones area, showing that the proposed development is not subject to risk of coastal flooding.

With regard to Fluvial Flooding, the CFRAM maps show the presence of a stream within the site, providing the estimated flood water levels for the 0.1% AEP Flood Event in two locations. Given the predicted water level (for the 0.1% AEP) of 70.21m and 64.79m and the lowest proposed level on site in these locations (71.96m and 66.89m respectively, which is 1.75m and 2.10m higher than the predicted water levels), it is concluded that the subject site is not at risk from fluvial flooding.

The CFRAM maps did not develop a study for the subject area for pluvial flooding, showing only the Dublin City area. However, the pluvial flood risk will be mitigated through an effective surface water and SuDS strategy. Similarly, a series of swales will intercept and collect the surface water runoff from the Kindlestown Hill and discharge it, at a control rate, into the existing stream within the site. The proposed discharge flow rate will be limited to what is currently being discharged to the stream such that existing flows within the stream are not increased as this could potentially create downstream impacts.

In relation to groundwater vulnerability, the site is classified in class 'M' for moderate, showing a moderate possibility that the site's groundwater can be contaminated. Groundwater was encountered during the ground investigations carried out and further details can be found in the Hydrogeological Assessment by Enviroguide Consultants. It is concluded that the subject site is located with Flood Zone C, negating the requirement of a Justification Test.'

Summary of Ecological importance.

The AA Screening is supported by an Environmental Impact Assessment Report. Biodiversity assessments were carried out on site as outlined in Table 1:

Table 1 : Biodiversity Fieldwork Dates

Survey	Dates
Habitat and Flora Assessment	31 st August 2020 & 31 st August 2021,
Terrestrial Mammal	6 th November 2020, 26 th February 2021 & 7 th January 2022
Bat Assessment	31 st August 2020, 31 st August 2021.
Wintering bird Assessment	6 th November 2020, 26 th February 2021, 27 th March 2021, 7 th January 2022 and 20 th January 2022.

In summary, the proposed development site consists primarily of Improved agricultural grassland (GA1) and hedgerows (WL1), scrub (WS1) and treelines (WL2). No flora or habitats of National or international conservation importance were noted on site during the surveys. No invasive flora species were noted on site. No flora species of conservation importance or invasive species were noted on site by the NPWS or NBDC or during site surveys. No amphibians or reptiles were noted on site. However, given the favourable habitats on site for frogs it would be expected that the wetland, riparian, spring and pond habitats would be locally important. Native hedgerows were noted on site. These would also be seen to be locally important to biodiversity. In relation to bird species no bird species on Annex I of the EU Birds Directive or qualifying interests of nearby SPA's were noted on site by NPWS or NBDC. The watercourse (acting as a biodiversity corridor), drainage ditches, springs, wetland, pond, hedgerows and treelines would be seen as the most important habitats on site. These elements form refuges and food sources for local biodiversity and provide biodiversity corridors to the surrounding areas. It should be noted that prior to the commencement of the design stage of this project, the local biodiversity value of these habitats was noted. As a result, the proposed development has been designed around the retention of these habitats and biodiversity corridors where possible. Further information is provided in Appendix I.

Irish Water Web Map

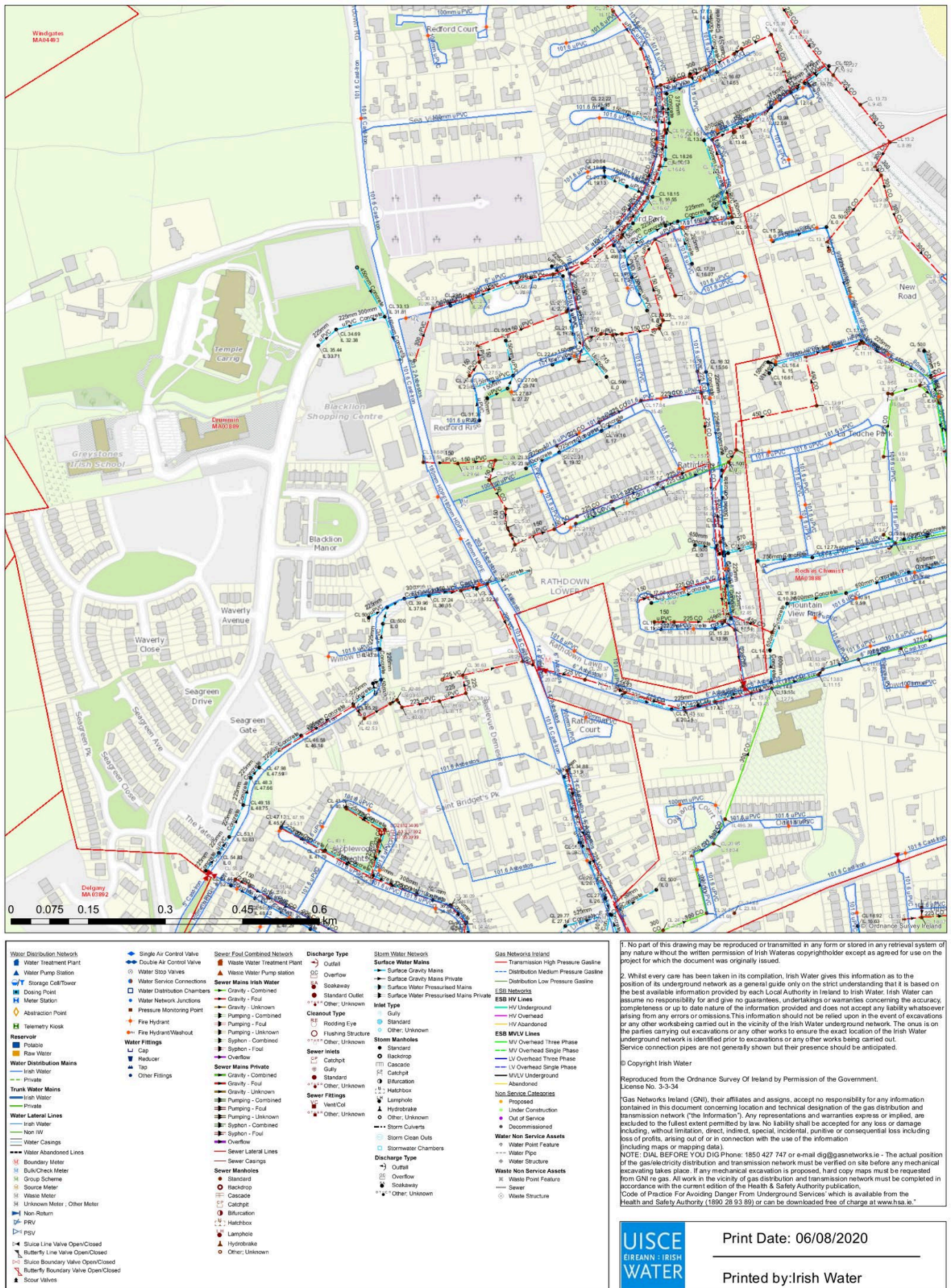


Figure 6. Existing drainage networks



A PROPOSED DRAINAGE LAYOUT - SHEET 2 OF 5
0502 Scale: 1:500

Figure 8. Proposed drainage layout (Sheet 2 of 5)



Figure 9. Proposed drainage layout (Sheet 3 of 5)



Figure 11. Proposed drainage layout (Sheet 5 of 5)

Identification of Relevant European Sites (Natura 2000 sites)

The proposed development is located in a suburban/rural environment surrounded by roads and terrestrial buffers. The proposed works are not within a European site. The European sites within 15 km are seen in Figures 13 & 14 and Table 1. There is an indirect pathway from the proposed development to Bray Head SAC via the watercourse on site and the surface water drainage network. Surface water from the site will discharge to the Greystones Stream, a proposed wetland area on site which has an existing underground pipe and the surface water network. The screening “IN” for NIS assessment for Bray Head SAC is seen in Table 2. Following the precautionary principle screening of all European sites within 15km and those with direct or indirect pathways (Table 1) was carried out in the AA Screening and all of these sites were screened out. There is no direct or indirect pathway to European sites beyond 15km.

Several springs are located within the subject site and the Greystones Stream traverses the centre of the subject site from west to east, before discharging to the Irish Sea at Greystones North Beach (Figure 8). A spring is located just outside the site’s north-west corner of the site and drains along the northern boundary. Another spring was identified within the heart of the proposed open space in the centre of site. This flows into an area of willow woodland. A high-water table was also identified on site. There is potential for pollutants, dust or silt laden run off to enter the watercourse (Greystones Stream) and drainage ditches on site, in addition to the Kilruddery/Deerpark Stream (north of the site) and the surface water network within the R761/R762, during construction and the Greystones Stream during operation and travel downstream in an easterly direction to the marine environment. The Killruddery_Deerpark_010 stream is located approximately 168 m from the northern boundary of the site along Redford Road. Given that this watercourse downhill from the site and along the main haul road that will be used for transport of materials to and from the site during construction, there is a potential for pollutants, chemicals, dust or silt laden run off to also enter this watercourse. Both the Greystones Stream and the Killruddery_Deerpark_010 watercourse outfall to the Irish Sea at Greystones North Beach. The Greystones Stream and the Killruddery_Deerpark_010 outfall approximately 455 m and 185 m from the Bray Head SAC.

Surface water drainage from the site will be discharged to the Greystones Stream, a proposed wetland area on site and the existing surface water network all of which ultimately discharges to the Irish Sea. Foul water drainage from the proposed development will connect to and upgraded foul sewer and then to the existing sewer that flows east towards Victoria Road, to the existing pumping station and then to Greystones Wastewater Treatment Facility. The water will be treated at Greystones Wastewater Treatment Facility before being discharged to the Irish Sea. There is no direct hydrological pathway from the development site to the designated European sites. All drainage networks enter the marine environment prior to reaching designated sites. There is an indirect pathway via the foul and surface water drainage networks to marine based European sites within 15 km.

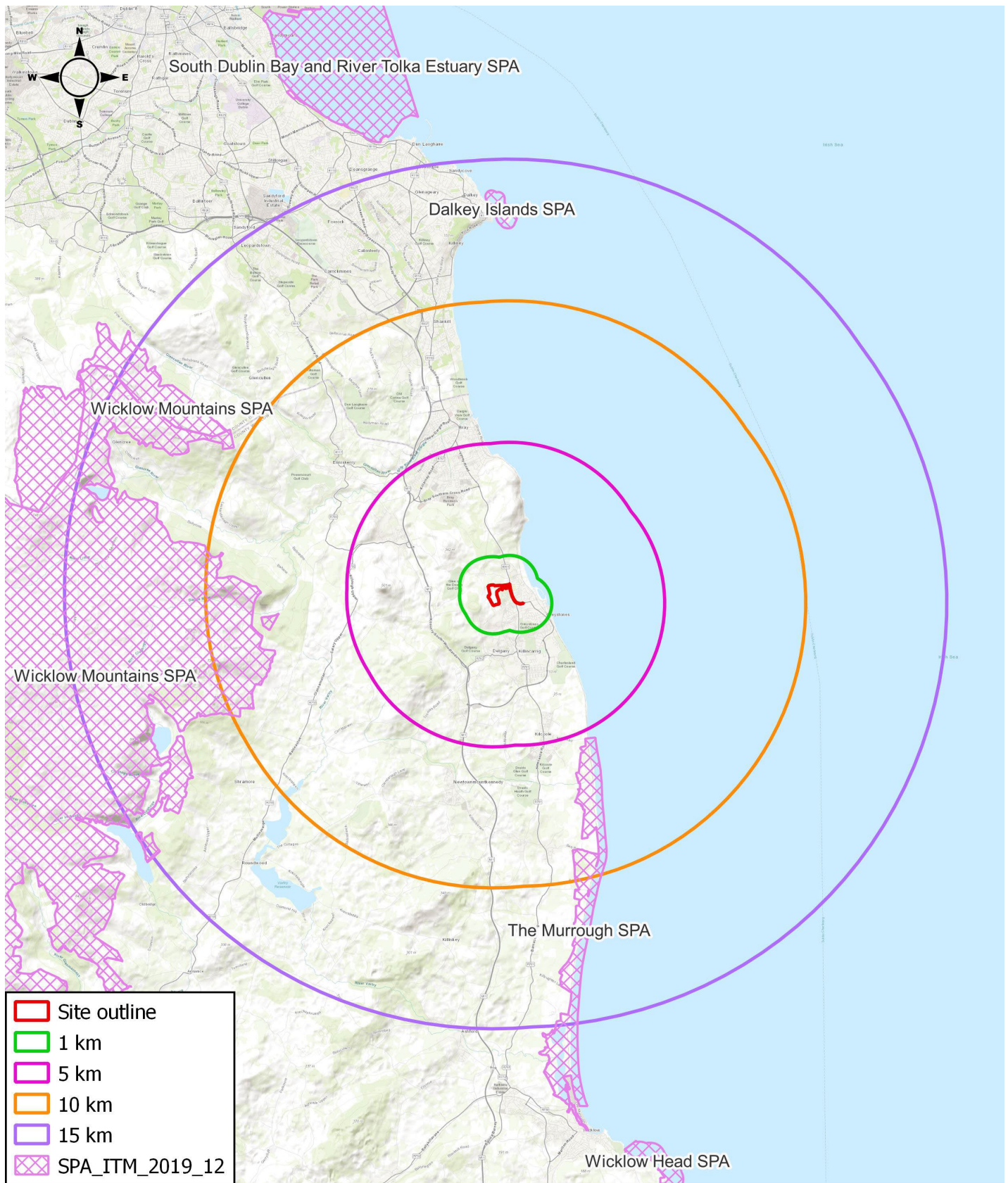
Table 2. Proximity to designated sites of conservation importance

European Site Code	European Site	Distance	Screened In for NIS
Special Areas of Conservation			
IE000714	Bray Head SAC	667 m	Yes
IE000719	Glen of the Downs SAC	1.9 km	No
IE002249	The Murrough Wetlands SAC	4.3 km	No
IE000713	Ballyman Glen SAC	6.1 km	No
IE000716	Carriggower Bog SAC	6.3 km	No
IE000725	Knocksink Wood SAC	6.7 km	No
IE002122	Wicklow Mountains SAC	7.8 km	No
IE003000	Rockabill to Dalkey Islands SAC	10.2 km	No
Special Protected Areas			
IE004186	The Murrough SPA	5.3 km	No
IE004040	Wicklow Mountains SPA	7.4 km	No
IE004172	Dalkey Islands SPA	12.5 km	No

Table 3. Initial screening in of Bray Head SAC.

European Site Code	Name	Details/Reason
IE000714	Bray Head SAC	<p>Conservation Objectives To maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected</p> <p>Features of Interest Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030]</p> <p>Potential Impact The development site is located within a suburban/rural area 667 m from the Bray Head SAC (Figure 13). This SAC is marine/coastal in nature and its features of interest are coastal habitats. There is an indirect pathway from the proposed development to this SAC via the watercourse on site and the surface water drainage network. Surface water from the site will discharge to the Greystones Stream, a proposed wetland area on site which has an existing underground pipe and the surface water network. Works also have the potential to impact on the Killruddery/Deerpark Stream and the surface water network in the R761/R762. All drainage networks and watercourses flow easterly to the marine environment at the North Beach in Greystones. In the absence of mitigation measures, silt or pollution could enter the watercourses and surface water networks which lead to the marine environment. There is potential for pollution of the watercourses to occur during these works.</p> <p>In addition, works are proposed on the road network, the surface water drainage of which leads to the marine environment via public surface water network and the Greystones Stream. Despite the discharging of watercourses and the public surface water network to the marine environment, due to the proximity of Bray Head SAC it is considered that there is an indirect hydrological pathway to this conservation site. The potential impacts on the features of interest of the Bray Head SAC (Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] and European dry heaths [4030]), in the absence of mitigation would be considered to be imperceptible. This is primarily as a result of the Qualifying interests being terrestrial habitats and the indirect pathway being via the marine environment. If the proposed works were to be carried out in the absence of mitigation within storm events where there is potential for seaspray to be transferred to the terrestrial habitats there is potential for fine silt to enter the terrestrial environment and deposit on plant material.</p> <p>In the absence of mitigation, runoff during site clearance, re-profiling, the construction and operation of project elements could impact on the Greystones Stream, Killruddery/Deerpark stream and surface water network, with water quality or downstream impacts on the marine environment. Impacts on these indirect pathways would be seen as the primary vector for impacts on this SAC. There is, therefore, potential for the proposed development to have a significant effect on the conservation objectives and features of interest of this SAC in the absence of mitigation measures. Mitigation measures are required to protect the Features of Interest of the SAC.</p> <p>Stage 2 AA (Natura Impact Statement) is Required.</p>





0 10 20 km

Project: Coolagad
Location: Greystones, Co. Wicklow
Date: 17th January 2022
Drawn By: Bryan Deegan (Altamar)

ALTEMAR
Marine & Environmental Consultancy

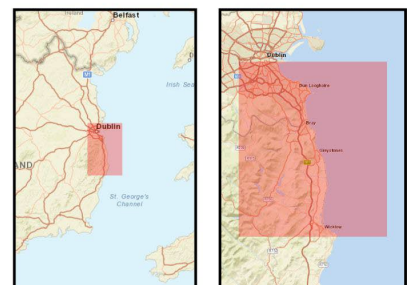


Figure 14. Special Protected Areas located within 15km of the proposed development

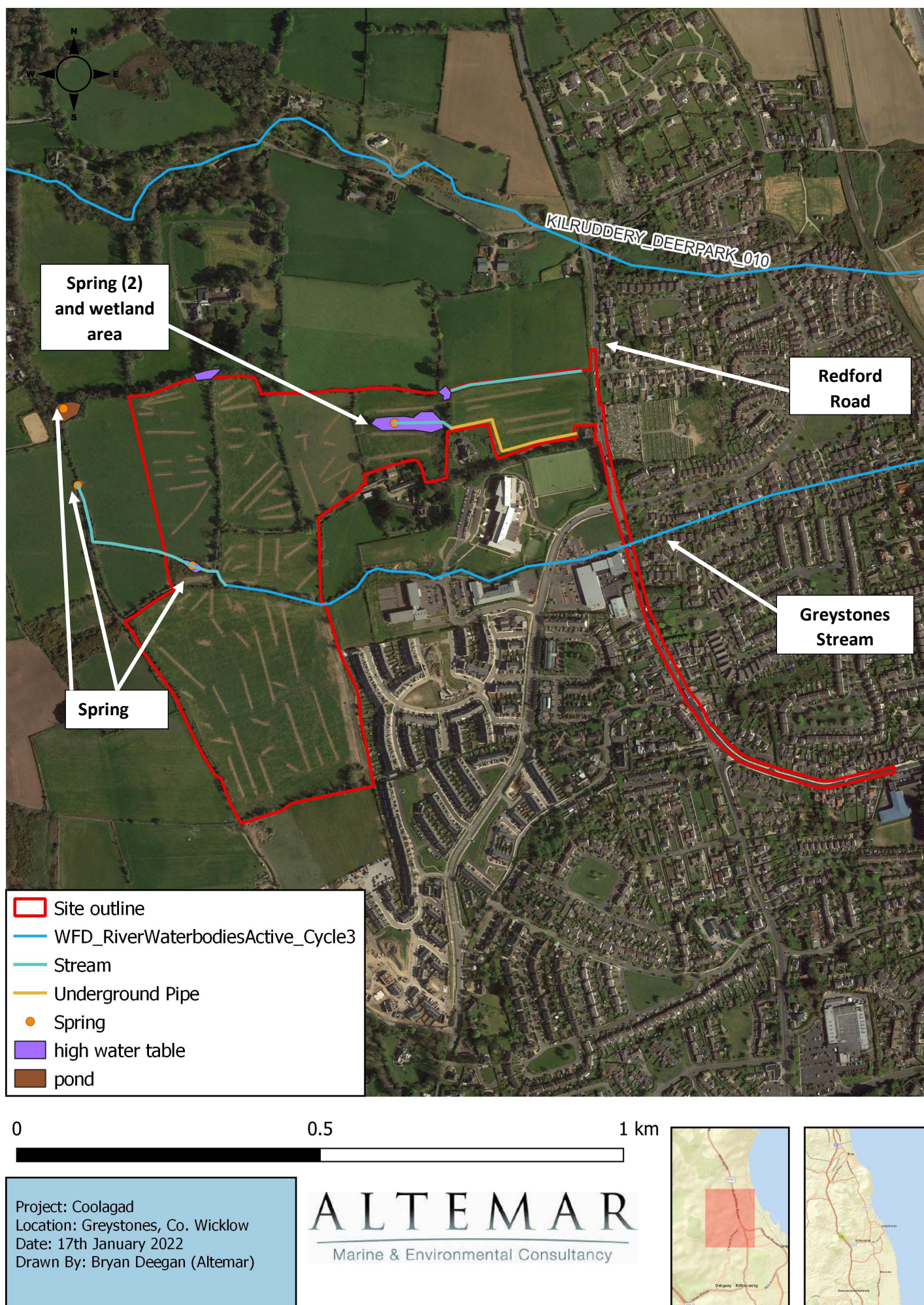
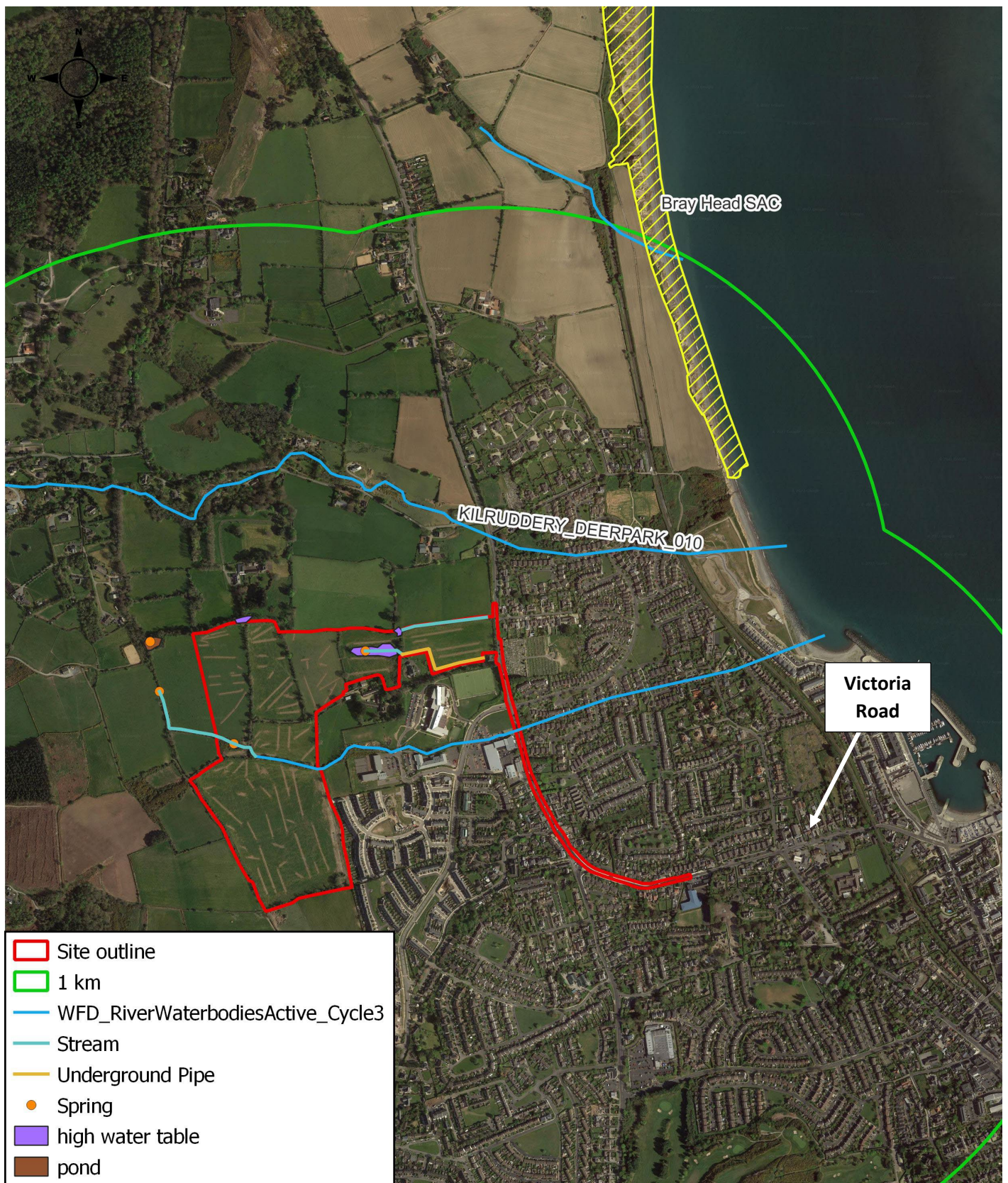


Figure 15. Waterbodies proximate to the proposed development site



0

0.9

1.8 km

Project: Coolagad
Location: Greystones, Co. Wicklow
Date: 17th January 2022
Drawn By: Bryan Deegan (Altamar)

ALTEMAR
Marine & Environmental Consultancy

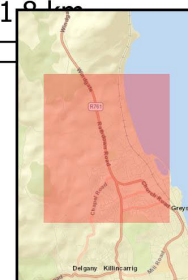


Figure 16. Waterbodies and SACs within 1 km of the proposed development

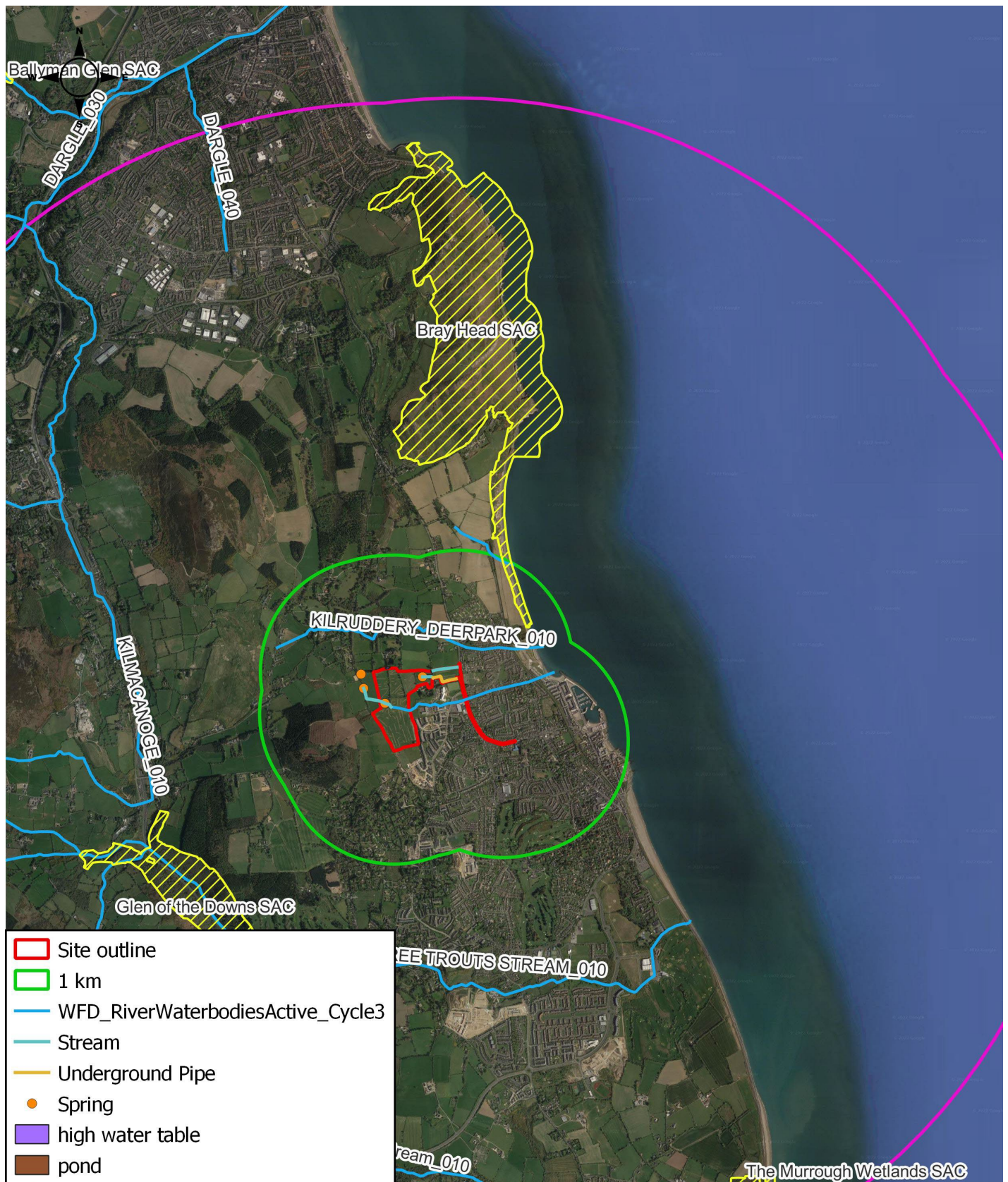


Figure 17. Waterbodies and SACs within 5 km of the proposed development

In-Combination Effects

There are several development proposals located in the areas surrounding the subject site that have been granted permission. The following is a list of planning application(s) as identified on the Department of Housing, Local Government and Heritage's 'National Planning Application Database' portal (Table 3):

Table 3. List of planning application(s) as identified on the Department of Housing, Local Government and Heritage's 'National Planning Application Database' portal.

Ref. No.	Address	Proposal
138103	Coolagad, Blacklion, Greystones, Co. Wicklow	split level, part two storey, part three storey post primary school comprising general classrooms, special needs unit, specialist rooms, support teaching spaces, administration areas, PE hall and ancillary accommodation with a total combined floor area of c7997 sqm. The site works to the school grounds will consist of a new exit onto the Blacklion Road, the provision of car parking spaces, drop off and pick up facilities, bicycle parking, 4 no ball courts, service yard, external store, bin stores, playing pitch, associated landscaping and boundary treatments
17461	Waverly, Blacklion, Greystones, Co. Wicklow	amendment to roadway and hammerhead at the south west corner of the site and the relocation of 34 - 47 Waverly Avenue as permitted under Planning REg Ref 14/1925, to include the change of floor and ridge levels together with associated site works
141773	Templecarrig House, Templecarrig Lower, Greystones, Co. Wicklow	subdivision of lands of Templecarrig House, Templecarrig Lower, Greystones; additional driveway with altered ground levels from within existing gateway; and works to existing 142sqm cottage adjacent to house to include renovations, 147sqm cottage adjacent to house to include renovations, 147sqm ground floor extensions, raising the roof to provide 110sqm dormer accommodation, alterations to outbuildings and replacement of septic tank with biocycle waste water treatment system and soil polishing filter
18371	Rathdown Lower/Greystones Harbour & North Beach, Greystones, Co. Wicklow	alterations to previously approved plans of an integrated harbour / marina mixed development linked to a linear coastal public park providing leisure recreational, open space and marine facilities and mixed form residential, commercial, civic and social amenities centred around the former harbour. Alterations to previously approved Terrace Number 12 and alterations and redesign of previously approved public park. There is a decrease proposed of 3 units in the number of residential units approved
161269	Churchlands, Killincarrig, Delgany, Co. Wicklow	site of c 9.27 ha bounded generally by 'Delgany Wood' (Cherry Glade and Delgany Glen) to the south, 'Bellevue Heights' housing development and houses fronting Kindlestown Lower Road (R761) to the east, 'Kenmare Height' and 'Kindlestown Park' housing development to the north, St Laurences NS to the northwest, housing fronting Chapel Road (L1027) and Kindlestown House to the west. The development comprises the construction of 132 no dwellings, ranging in height from single storey to 2 storey dormer, each including 2 no car parking spaces on curtilage and solar panel at roof level, housing mix to comprise 58 no 3 bed semi detached units, 14 no 4 bed semi detached units,

Ref. No.	Address	Proposal
		4 no 4 bed detached units, and 15 no 3 bed terraced units, all with optional single storey extension to rear and 37 no 3 bed terraced units and 4 no 3 bed bungalows without optional single storey extension to rear, and 37 no. 3 bed terraced units and 4 no 3 bed bungalows without optional single storey extension to rear, 4 no visitor car parking spaces, 1 no 2 storey creche (c342 sqm gfa), all ancillary and associated site development, landscaping and boundary works, inc redevelopment of existing playing pitch to provide 2 no grass pitches, and 1 no all weather junior pitch and a mixed use games area, new surface car park to serve St Laurences NS and adjacent community facilities incl creche. New vehicular access through the site from Delgany Glen to Chapel Rd with assoc road improvement works. New greenroute pedestrian and bicycle route through the site from Delgany Glen to Chapel Rd. New pedestrian access to the south east of the site to facilitate link to the Kindlestown Lower Road (R761)
151307	Richview House, Bellevue Hill, Delgany, Co. Wicklow	89 two storey dwellings including 25 no. 4 bed detached dwellings, 28 no. 4 bed semi-detached dwellings, 18 no. 3 bed semi-detached dwellings, 6 no. 3 bed terraced dwellings and 12 no. 2 bed terraced dwellings; for the removal of existing stables, out-buildings and the partial removal and change of use of the existing dwelling (Richview House) to a creche (275sqm) including 8 no. surface car parking space, bin storage, cycle parking and external play area; for the construction of an ESB substation and switchroom (25sqm); for all boundary walls and fences, proposed vehicular and pedestrian entrances to the development off Bellevue Hill and associated signage, internal estate road, visitor surface car parking, footpaths, hard and soft landscaping and all site services above and below ground including connection to existing services.
138744	Bellevue, Delgany, Co. Wicklow	P.R.R. 08/250 (18 hole golf course, practice facilities, part single storey part 2 storey clubhouse, car park with provision of 122 car spaces and provision for 2 coach spaces, separate maintenance facility & associated site development works, access road, service and landscaping, access from existing road entrance)
20545	Richview House, Bellevue Hill, Delgany, Co. Wicklow	amendments to the previously permitted residential development (An Bord Pleanála Reference No. PL27.248401 / Wicklow Co. Co. File Register Reference No. 15/1307). The amendments will consist of the following: A) An amendment to the layout of 36 no. previously permitted dwellings (no. 19 to 34 inclusive, 54 to 60 inclusive and 72 to 84 inclusive) for the construction of 10 no. additional dwellings. The amended development will consist of 92 no. new single, two and three storey dwellings including 5 no. 4 bed detached dwellings, 14 no. 4 bed semi-detached dwellings, 44 no. 3 bed semi-detached dwellings, 28 no. 3 bed terraced dwellings and 1 no. 2 bed terraced dwelling. The proposal includes the omission of previously permitted houses types A, B, E & F

Ref. No.	Address	Proposal
		and the inclusion of new houses types J1, M1 & N; B) The position of previously permitted dwelling no's 43 to 53 inclusive are to be moved south. The alignment of the internal estate road and public open space in front of these dwellings is to be amended accordingly; C) The position of the previously permitted northern site boundary wall and fencing is proposed to be moved; D) The proposed alteration to previously permitted house type H (previously permitted dwelling no's 47 , 48 & 49). The 2 no. type H end of terrace 3 bed dwellings are to be reduced in gross floor area from 103.8sqm to 101.7sqm; E) The previously permitted 3m high boundary wall with the convent land on the southeast site boundary is to be reduced in height to provide a 1.8m high capped and rendered blockwork wall; F) A 10sqm extension to the rear of the previously permitted creche. The new gross floor area is to be 154sqm with a proposed increase in childcare capacity from 23 to 25 child spaces
161301	Churchlands, Killincarrig, Delgany, Co. Wicklow	development bounded generally by 'Delgany Wood' (Cherry Glade and Delgany Glen) to the south, 'Bellevue Heights, housing development and houses front Kindlestown Lower Road (R761) to the east, 'Kenmare Heights' and 'Kindlestown Park' housing developments to the north, St Laurences NS to the northwest, housing fronting Chapel Road (I1027) and Kindlestown House to the west. The development comprises the construction of 132 no dwellings, ranging in height from single storey to 2 storey dormer, each including 2 no car parking spaces on curtilage and solar panel at roof level. Housing mix to comprise 58 no 3 bed semi detached units, 14 no 4 bed semi detached units, 4 no 4 bed detached units, 15 no 3 bed terraced units, all with optional single storey extension to rear, and 37 no 3 bed terraced units and 4 no 3 bed bungalows without optional single storey extension to rear, 4 no visitor car parking spaces, 1 no 2 storey creche (c342 sqm), all ancillary and associated site development, landscaping and boundary works, including redevelopment of existing playing pitch to provide 2 no grass pitches (60m x 90m each), and 1 no all weather junior pitch and a mixed use games area (27m x 90m), new surface car parking (72 no spaces and set down areas) to serve St Laurences NS and adjacent community facilities including creche. New vehicular access through the site from Delgany Glen to Chapel Road with associated road improvement works. New greenroute pedestrian and bicycle route through the stei from Delgany Glen to Chapel road, new pedestrian access to the south east of the site to facilitate link to the Kindlestown Lower Road (R761)
138178	Stylebawn, Delgany, Co. Wicklow	extend the appropriate period of a permission - 07/1150 - construction of a residential development with an overall gross floor area of 4113 sqm comprising 11 no residential dwelling houses comprising of 1 no single level house, 6 no

Ref. No.	Address	Proposal
		two storey houses and 4 no three storey split level houses, all with private gardens and off street car parking, vehicular and pedestrian entrance to the site via a new entrance from the R762 road, a widening of the R762 carriageway to provide for a 6 metre carriageway and a 2 metre pedestrian footpath on the south side of the R762 along the frontage of the subject site, a new internal road including the construction of a new timber vehicular bridge across the Three Trouts Stream, all associated site development works including landscaping and pumping station
126029	Cloonlumney, Coolagad, Delgany, Co. Wicklow	demolition of a two storey side extension and construction of a two storey side extension, modifications to existing external openings and main pitched roof, internal alterations and associated site works for dwelling house

In relation to Planning Ref. **18371**, An Appropriate Assessment Screening Report was carried out by Biosphere Environmental Services. The report states that: *'The potential effects that may arise from construction and operation of the project on the Natura 2000 network have been examined by considering the potential for significant effects, alone or in-combination with other projects, on the Bray Head SAC (the only designated European site which conceivably could be affected by the project).'*

On the basis of the findings of this screening report, it is concluded that the project:

- (i) Is not directly connected with or necessary to the management of a Natura 2000 site, and*
- (ii) Significant impacts on the Natura 2000 network are not foreseen.'*

No significant projects are proposed or currently under construction that could potentially cause in combination effects on European sites.

Given this, it is considered that in combination effects with other existing and proposed developments in proximity to the application area would be unlikely, neutral, not significant, and localised. It is concluded that in the view of best scientific knowledge and in view of the sites' conservation objectives, no in combination effects will adversely affect the integrity of Bray Head SAC.

Bray Head SAC

A further review of the Conservation Objectives and features of interest is necessary to determine if significant effects are likely to impact the Bray Head SAC.

Bray Head SAC (Site code: 000714)

Bray Head SAC (Figure 16) is located 667 m from the planning boundary. There is potential for the proposed development to be hydrologically connected to Bray Head SAC, via the Greystones Stream, the Killruddery_Deerpark_010 watercourse and the multiple springs identified on site which connect to the surface water network. There is potential for pollutants or chemicals to enter these watercourses during the construction of the development and negatively impact on the features of interest or conservation objectives of the proposed development.

Site-specific data

As outlined in the Bray Head SAC Site Synopsis (NPWS, Version date 23.09.2013):

'This coastal site is situated in the north-east of Co. Wicklow between the towns of Bray and Greystones. The bedrock geology is Cambrian quartzites and shales (with mudstones and greywackes). Bray Head consists of a plateau of high ground, with five prominent quartzite knolls and has a maximum height of 241 m. The more exposed higher ground has a covering of shallow acidic soils, with protruding bedrock and scree. Elsewhere, deeper soils are formed by drift deposits and are calcareous in character.'

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (= priority; numbers in brackets are Natura 2000 codes)*

[1230] Vegetated Sea Cliffs

[4030] Dry Heath

*Dry heath is the principal habitat over much of Bray Head. The vegetation of the upper plateau area is dominated by dwarf shrubs, mainly Heather (*Calluna vulgaris*), Bell Heather (*Erica cinerea*) and gorse (*Ulex europaeus* and *U. gallii*). Broom (*Cytisus scoparius*) also occurs, and associated with the gorse and broom is the Red Data Book species Greater Broomrape (*Orobanche rapum-genistae*). In the areas where the shrubs are less dense Tormentil (*Potentilla erecta*), Common Milkwort (*Polygala vulgaris*), Heath Bedstraw (*Galium saxatile*) and a variety of grasses (e.g. *Aira praecox*, *Agrostis tenuis*, *Deschampsia flexuosa*) are present. Where rock outcrops occur species such as English Stonecrop (*Sedum anglicum*) and Sheep's-bit (*Jasione montana*) are found. Bracken (*Pteridium aquilinum*) is dominant in some areas. The heath communities which occur on the dry slopes above the sea cliffs, especially those south-facing, are more open in character and dominated by grasses rather than dwarf shrubs. The annual plant communities which develop here are typical of those found only on sites in south-eastern Ireland. Common species include Wood Sage (*Teucrium scorodonia*), clovers (*Trifolium dubium* and *T. campestre*), Scarlet Pimpernel (*Anagallis arvensis*) and Field Madder (*Sherardia arvensis*). An uncommon annual species which can appear abundantly in the heath after a fire event is Yellow Fumitory (*Corydalis claviculata*). Some rare plants are found in this habitat, notably Bird's-foot (*Ornithopus perpusillus*) and Spring Vetch (*Vicia lathyroides*), both Red Data Book species. Calcareous dry grassland, typically species-rich, occurs on deposits of glacial till. The primary grass species are Quaking-grass (*Briza media*), Smooth Meadow-grass (*Poa pratensis*) and Red Fescue (*Festuca rubra*). Typical calcicole herbs include Pale Flax (*Linum bienne*), Salad Burnet (*Sanguisorba minor*), Burnet-saxifrage (*Pimpinella saxifraga*), Carlina Thistle (*Carlina vulgaris*) and Kidney Vetch (*Anthyllis vulneraria*). Orchids are a feature of this habitat, with five species known from the area - Pyramidal Orchid (*Anacamptis pyramidalis*), Common Spotted-orchid (*Dactylorhiza fuchsii*), Common Twayblade (*Listera ovata*), Fragrant Orchid (*Gymnadenia conopsea*) and Bee Orchid (*Ophrys apifera*). Bloody Crane's-bill (*Geranium sanguineum*) was refound recently in this community at Bray Head - this is a typical species of the Burren and associated areas, and is very rare in eastern Ireland. Rocky sea cliffs, another Annex I habitat, form most of the seaward boundary at this site and extend for approximately 2 km. Steep clay cliffs extend southwards for a further 1 km, with a small area of clay*

cliff also at the northernmost part of site. The rocky cliffs are divided by a railway track built in the 1800s. The lower cliffs are fairly steep in places but above the track they are less steep, and often support heath or dry grassland vegetation. In parts the cliffs are up to 60 m in height. Typical species of the more exposed rock areas are Common Scurvygrass (*Cochlearia officinalis*), Rock Sea-spurrey (*Spergularia rupicola*), Thrift (*Armeria maritima*), Sea Campion (*Silene vulgaris* subsp. *maritima*), and Sea Samphire (*Crithmum maritimum*). On some sections of the cliff face, the locally scarce Tree Mallow (*Lavatera arborea*) is found. Species of the upper cliff flora include Kidney Vetch and Red Fescue. A widespread species found from the mid to upper zones of the cliff face is Ivy (*Hedera helix*), and associated with this is the scarce Wild Madder (*Rubia peregrina*). The clay cliffs in the southern part of the site are steep and unstable and have little vegetation. A stand of mostly native woodland occurs in the northern part of the site. This is a fairly pure Sessile Oak (*Quercus petraea*) dominated woodland, with some Ash (*Fraxinus excelsior*) and Downy Birch (*Betula pubescens*). Understorey trees include Holly (*Ilex aquifolium*) and Hawthorn (*Crataegus monogyna*). The wood is on shallow drift and the ground flora often has species more associated with heath than woodland. Other habitats which are found at this site include bedrock shore, a sandy/shingle beach and an area of shallow marine water. Bray Head has an important seabird colony. A census in 1999 gave the following populations: Fulmar (55 pairs), Shag (8 pairs), Kittiwake (781+ pairs), Guillemots (286 individuals), Razorbills (191 individuals) and Black Guillemots (123 individuals). A few pairs of gulls also breed. Both the Kittiwake and Black Guillemot populations are of national importance. Peregrine Falcon, an Annex I species of the E.U. Birds Directive, breeds at the site, as do Raven and Kestrel. Characteristic bird species of the heath areas include Stonechat, Whitethroat, Linnet and Skylark. The heath and grassland habitats at this site are threatened by reclamation for agriculture and also by frequent burning. The site is a popular recreational area and is especially used by walkers.'

The Qualifying Interests (QI) (Features of Interest) and the National conservation status of the QI for Bray Head SAC are seen in Table 4.

Table 4. Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for Bray Head SAC.

Qualifying Interests, Conservation Status, Management Objectives, Conditions underpinning site integrity for relevant European sites		
European Site Name & Code	Qualifying Interests	Current Conservation Status & Trend
Bray Head SAC [IE000714]	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030]	Inadequate Unfavourable

The Conservation Objectives and overall status of species and habitats in Bray Head SAC are as follows³⁴. In relation to Vegetated Sea cliffs:

'The overall objective for 'Vegetated sea cliffs of the Atlantic and Baltic coasts' in Bray Head SAC is to 'maintain favourable conservation condition'. The objective is based on an assessment of the recorded condition of the habitat under a range of attributes and targets. The assessment is divided into three main headings: (a) Area, (b) Range and (c) Structure and Functions.

A. Area - Habitat length

The target is for the area to be stable, subject to natural processes, including erosion.

B. Habitat distribution

The target is that there is no decline in distribution, subject to natural processes.

³ NPWS (2017) Conservation Objectives: Bray Head SAC 000714. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs

⁴ Bray Head SAC (site code: 714) Conservation objectives supporting document- Coastal habitats

C. Structure and Functions

- **Physical structure: functionally and hydrological regime**
The target is to maintain, or where necessary restore, the natural geomorphological processes without any physical obstructions, and the local hydrological regime including groundwater quality.
- **Vegetation structure: zonation**
The target is to maintain the range of sea cliff habitat zonations, as well as transitional zones, including those to terrestrial communities, subject to natural processes.
- **Vegetation structure: vegetation height**
The target is to maintain the structural variation in the sward height.
- **Vegetation composition: typical species and sub-communities**
The target for this attribute is to ensure that the typical flora of vegetated sea cliffs is maintained, as are the range of sub-communities within the different zones.
- **Vegetation composition: negative indicator species**
The target for this attribute is that negative indicator species (including non-native species) should make up less than 5% of the vegetation cover.
- **Vegetation composition: bracken and woody species**
The target for this attribute is that in the case of maritime grassland and/or heath, bracken should make up less than 10% of the vegetation cover, while woody species should make up no more than 20% of the vegetation cover.

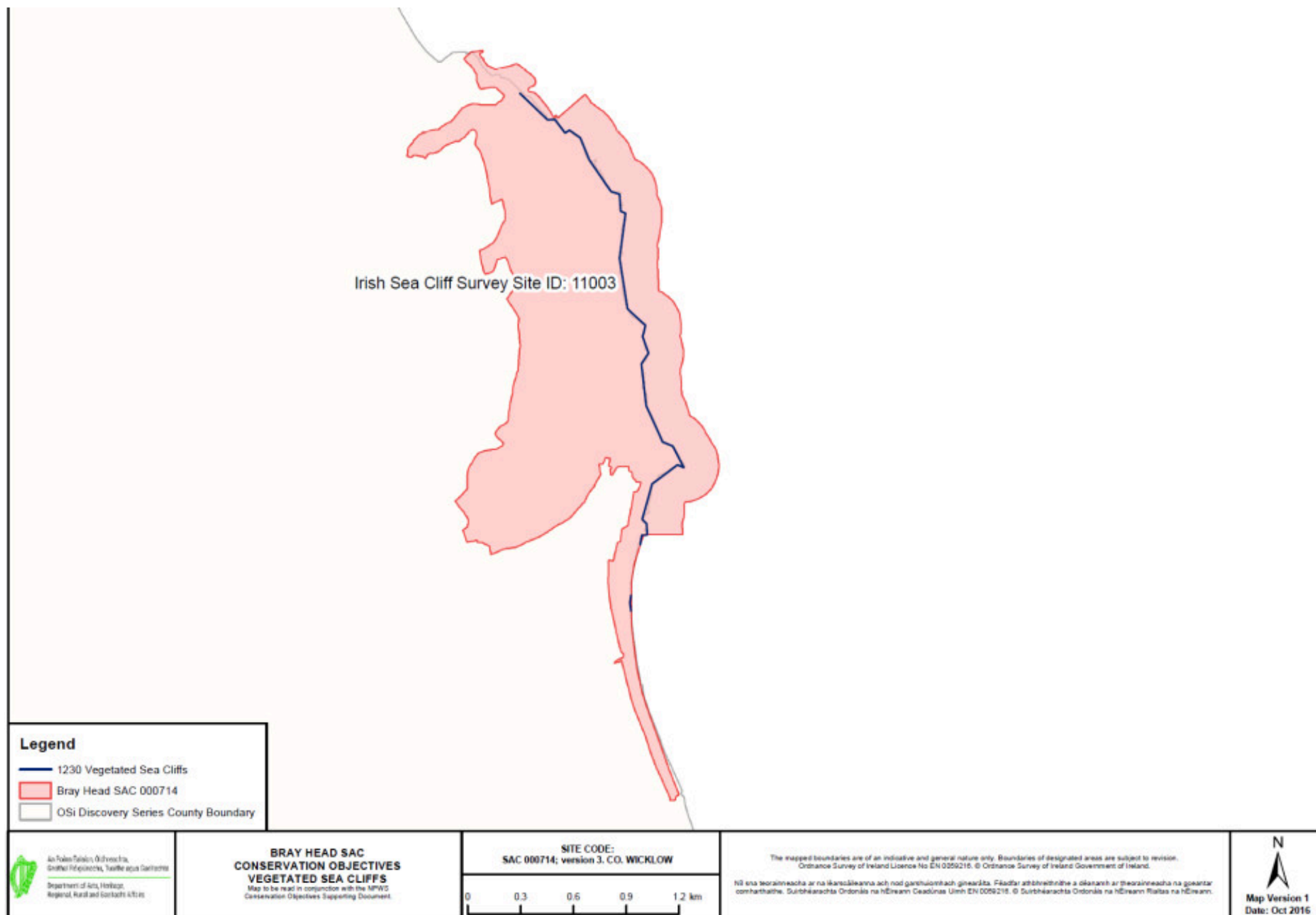


Figure 18. Distribution of Vegetated Sea Cliffs within Bray Head SAC

The attribute, measure and target of the site-specific Conservation Objectives for Bray Head SAC are seen in Table 5.

Table 5. Attribute, measure and target of the site conservation objectives for Bray Head SAC

Attribute	Measure	Target
Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] (To maintain and restore the favourable conservation condition)		
Habitat length	Kilometres	Area stable, subject to natural processes, including erosion. For the sub-site (Bray Head) mapped, total length of cliff sections: 3.27km
Habitat distribution	Occurrence	No decline, subject to natural processes.
Physical structure: functionality and hydrological regime	Occurrence of artificial barriers	No alteration to natural functioning of geomorphological and hydrological processes, including groundwater quality, due to artificial structures
Vegetation structure: zonation	Occurrence	Maintain range of sea cliff habitat zonations including transitional zones, subject to natural processes including erosion and succession
Vegetation structure: vegetation height	Centimetres	Maintain structural variation within sward
Vegetation composition: typical species and subcommunities	Percentage cover at a representative number of monitoring stops	Maintain range of subcommunities with typical species listed in the Irish Sea Cliff Survey (Barron et al., 2011)
Vegetation composition: negative indicator species	Percentage	Negative indicator species (including non-natives) to represent less than 5% cover
Vegetation composition: bracken and woody species	Percentage	Cover of bracken (<i>Pteridium aquilinum</i>) on grassland and/or heath less than 10%. Cover of woody species on grassland and or heath less than 20%
European dry heaths [4030] (To restore the favourable conservation condition)		
Habitat area	Hectares	Area stable or increasing, subject to natural processes
Habitat distribution	Occurrence	No decline, subject to natural processes
Ecosystem function: soil nutrients	Soil pH and appropriate nutrient levels at a representative number of monitoring stops	Maintain soil nutrient status within natural range
Community diversity	Abundance of variety of vegetation communities	Maintain variety of vegetation communities, subject to natural processes
Vegetation composition: lichens and bryophytes	Number of species at a representative number of 2m x 2m monitoring stops	Number of bryophyte or non-crustose lichen species present at each monitoring stop is at least three, excluding <i>Campylopus</i> and <i>Polytrichum</i> mosses
Vegetation composition: number of positive indicator species	Number of species at a representative number of 2m x 2m monitoring stops	Number of positive indicator species present at each monitoring stop is at least two
Vegetation composition: cover of positive indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Cover of positive indicator species at least 50% for siliceous dry heath and 50- 75% for calcareous dry heath
Vegetation composition: dwarf shrub composition	Percentage cover at a representative number of 2m x 2m monitoring stops	Proportion of dwarf shrub cover composed collectively of bog-myrtle (<i>Myrica gale</i>), creeping willow (<i>Salix repens</i>) and western gorse (<i>Ulex gallii</i>) is less than 50%

Attribute	Measure	Target
Vegetation composition: negative indicator species	Percentage cover at a representative number of 2m x 2m monitoring stops	Total cover of negative indicator species less than 1%
Vegetation composition: non-native species	Percentage cover at, and in local vicinity of, a representative number of 2m x 2m monitoring stops	Cover of non-native species less than 1%
Vegetation composition: native trees and shrubs	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of scattered native trees and shrubs less than 20%
Vegetation composition: bracken	Percentage cover in local vicinity of a representative number of monitoring stops	Cover of bracken (<i>Pteridium aquilinum</i>) less than 10%

Analysis of the Potential Impacts on the Bray Head SAC

The proposed development consists of 586 residential units (351 houses; 203 apartments and 32 duplex units) and all associated works, at a site c. 26.03 ha at Coolagad, Greystones. The development will also include the provision of a community building (392 sqm), a creche, a sport field and a MUGA. Noise will be generated on site during construction and operation, however given the distance to the Bray Head SAC (667 m) and that the features of interest of the SAC are Vegetated sea cliffs and European dry heaths, there will be no impact from noise pollution on the SAC. The Greystones Stream (Figure 19) runs directly through the centre of the proposed development site, whilst the stream to the north of the site flows approximately 168 m downhill from the site on the Redford Road (Figure 19), which is the road that will be used for transport of materials to and from the development site. It is also proposed to redirect the flows from the upstream catchment to the Greystones Stream, which gives rise to the potential for pollutants and chemicals to enter the watercourse. There is potential for pollutants during construction of the proposed development site to enter both watercourses (Greystones Stream and the Stream to the North of the site respectively), which ultimately outfall to Greystones North Beach, approximately 452 m and 188 m from the Bray Head SAC. These factors have the potential to impact the conservation objectives of the Bray Head SAC.

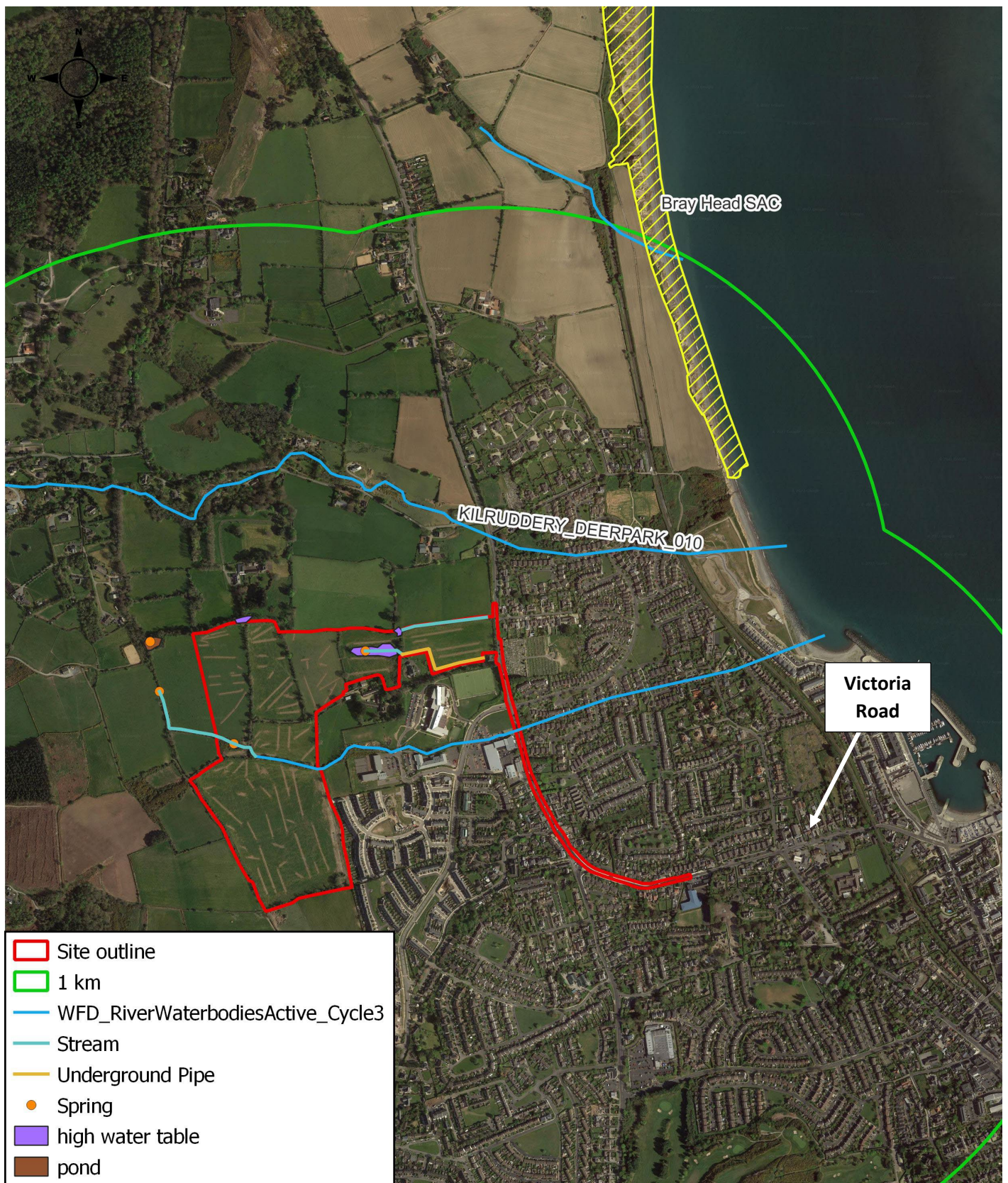


Figure 19. Waterbodies and SACs within 1 km of the proposed development

Construction Impacts

The construction of the proposed development would potentially impact on the existing ecology of the site and the surrounding area and Bray Head SAC via the indirect pathways leading to the marine environment. The potential impacts are outlined in Table 6. Construction phase mitigation measures are required on site particularly as construction will occur in the upstream catchment to the Greystones Stream, which outfalls to the marine environment proximate to the Bray Head SAC. Surface water from the site will also discharge to the existing stream, the existing wetland or the underground pipe on site. The stream to the north of the site is also susceptible to pollution as it is downhill from the site outline on Redford Road, the main road which will be used for transport of materials to and from the site. Works are also proposed along the R761/R762 to install a foul sewer along this road (see project description). Surface water from the road leads into adjacent watercourses and in the surface water network all of which discharge into the marine environment. There is potential for silt laden runoff, dust, or contamination to enter the watercourses and surface water network, with potential for impacts on Bray Head SAC.

Designated European Sites

The proposed development is not within a designated conservation site. However, there is potential for pollutants to enter watercourses and surface water networks proximate to the proposed development works during the construction phase of the development. The Greystones Stream and the Killruddery_Deerpark_010 watercourse both outfall to the marine environment near the Bray Head SAC (452 m and 185 m respectively). Therefore, there is potential for an indirect hydrological pathway from the proposed development site to the Bray Head SAC via the watercourses and surface water networks.

The construction of the proposed development and the redirection of the flows from the upstream catchment to the Greystones Stream would potentially impact on the watercourse through silt laden runoff and pollution. These potential construction impacts on the European site are seen in Table 3. Mitigation measures are required to ensure that the proposed development will not impact on the conservation objectives of the European site (Bray Head SAC).

Operational Impacts

Once constructed all onsite drainage will be connected to separate foul and surface water systems. There is potential for pollution during the operational phase. However, surface water runoff will comply with SUDS and will discharge to either; the Greystones Stream or surface water networks. Mitigation measures will be required to ensure that water quality is maintained prior discharging to the surface water network.

Mitigation Measures and Monitoring

Construction and operational mitigation will be incorporated into the proposed development project to minimise the potential negative impacts within the Zone of Influence (Zoi) including the Greystones Stream, the Stream to the North and the downstream European site (Bray Head SAC) (Table 7). The mitigation has been designed to ensure that the project will comply with the Water Pollution Acts and standard County Council and Inland Fisheries Ireland requirements in relation to construction and drainage operations. All construction and operational phase controls outlined below will be followed. As the potential vector for impacts to Bray Head SAC would be seen to be via the surface water runoff and potential pollution to the Greystones Stream, the Killruddery_Deerpark_010 watercourse and surface water networks, no additional controls are required besides those outlined below, during the operational phase of the development, to mitigate against potential negative impacts on Bray Head SAC.

Table 6. Potential for adverse effects on the qualifying interests and conservation objectives of Bray Head SAC

European Site & Site Code	Qualifying Interests	Potential for Adverse Effects
Bray Head SAC IE000714	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030]	<p>Works on site, dust and surface water runoff on site during construction or operation may lead to silt or contaminated materials from site entering the Greystones Stream and the Killruder_Deerpark_010 watercourse. Concrete, silt, or pollution could enter the watercourse during enabling works including, redirection of the upstream catchment springs, site clearance, reprofiling and dewatering of foundations, if required during construction. If on-site concrete production is required or cement works are carried out in the vicinity of drains or the Greystones Stream, there is potential for contamination of the watercourses. The construction of the proposed development which crosses the Greystones Stream, (Figure 15) may have a significant impact on the water quality of the stream, which will then travel downstream to the marine environment and potentially the SAC. As it is proposed to redirect the flows from the upstream catchment to the Greystones Stream, as they will no longer be able to drain across the lands of the subject site, there is potential for pollutants and chemicals to enter the watercourse.</p> <p>The use of plant and machinery, as well as the associated temporary storage of construction materials, oils, fuels, and chemicals in addition to exporting materials offsite, could lead to pollution on site or in adjacent watercourses. The stream to the North of the site is 168 m downhill from the site outline on the main road which will be used for transport of materials to and from the site, there is potential for pollutants to enter this watercourse also. The storage of topsoil or works onsite could lead to dust, soil or silt laden runoff entering adjacent watercourses. The use of haul roads could lead to silt laden runoff or dust with downstream effects on the SAC. Contaminated wastewater from onsite toilets, could cause localised pollution.</p> <p>Without the presence of mitigation measures there is a potential for downstream effects if significant quantities of pollution or silt entered the stream, leading to the Bray Head SAC.</p> <p>Given the nature of the potential effects outlined above, the proposed project could impact on the:</p> <ol style="list-style-type: none"> 1) Habitat length, Habitat distribution, Physical structure: functionality and hydrological regime, Vegetation structure: zonation, Vegetation structure: vegetation height, Vegetation composition: typical species and sub-communities, Vegetation composition: negative indicator species, Vegetation composition: bracken and woody species of Vegetated sea cliffs 2) Habitat area, Habitat distribution, Ecosystem function: soil nutrients, Community diversity, Vegetation composition: lichens and bryophytes, Vegetation composition: number of positive indicator species, Vegetation composition: cover of positive indicator species, Vegetation composition: dwarf shrub composition, Vegetation composition: negative indicator species, Vegetation composition: non-native species, Vegetation composition: native trees and shrubs, Vegetation composition: bracken, Vegetation composition: soft rush, Vegetation structure: senescent ling, Vegetation structure: signs of browsing, Vegetation structure: burning, Vegetation structure: growth phases of ling, Physical structure: disturbed bare ground, Indicators of local distinctiveness of European dry heaths. <p>The mitigation measures outlined will be carried out to ensure that significant levels of silt or pollution do not enter the Greystones Stream or the Stream or the Killruder_Deerpark_010 watercourse from the construction or operation phases of the proposed project and create localised pollution. In the event of a pollution incident, it would be expected to be small e.g. maximum capacity of truck/digger fuel tank. However, by following the precautionary principle mitigation measures will be in place.</p>

Table 7. Mitigation Measures

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
Bray Head SAC	<ul style="list-style-type: none"> • Habitat degradation • Dust deposition • Pollution • Silt ingress from site runoff • Downstream impacts leading to the marine environment and SAC 	<p>Construction Phase Mitigation Measures for the protection of Bray Head SAC</p> <p>Biodiversity</p> <ul style="list-style-type: none"> • As existing springs, a watercourse and drainage ditches are present on site and substantial reprofiling and instream works are proposed, a project ecologist will be appointed prior to works or site clearance commencing on site. A project ecologist will oversee the project from prior to the commencement to the completion of the project including all landscaping, construction and drainage connections. • The retention of existing habitats as outlined with in the EIAR including springs, hedgerows and wetland areas will involve significant input from a project ecologist and arborist prior to construction commencing on site. The names, qualifications and experience of the ecologist, hydrologist and arborist will be provided to WCC prior to any works commencing on site. • A specific site clearance, reprofiling and phasing plan will be provided to the arborist and project ecologist for approval prior to any site clearance or works commencing on site. No site clearance works will commence on site until approval has been provided by the arborist and project ecologist for the works to commence. • All site clearance, reprofiling and enabling works will be approved and monitored by the arborist and project ecologist to ensure that the integrity of the remaining habitats on site are maintained. • All works in the riparian corridor will be carried out in consultation with and to the satisfaction of Inland Fisheries Ireland and the project ecologist, following the best practice guidelines for construction in the vicinity of watercourses. All works onsite and in the riparian corridor will include mitigation measures to prevent silt from runoff during works as set out below. • All works in the riparian corridor will be approved by Inland Fisheries Ireland prior to works commencing. • Replanting of the riparian corridor will be at the initial phase of the project. • During construction an Ecologist will monitor the site from pre-construction surveys, during Construction Phases and Post Construction. <p>Land, Soil & Geology</p> <p>Detailed design will be specified by an appropriately qualified geotechnical Engineer for the soil cut and fill requirements at the Site to ensure that ground stability is engineered and controlled appropriately. Where appropriate, suitable batters or retained vertical walls will need to be maintained on excavation faces to ensure the stability of adjacent ground, structures and services. The geotechnical site investigation report (SIL, 2021) set out recommendations for the management of temporary sloped sides for excavations of 33°, or 1:1.5 and where excavations extend to stiffer CLAY the temporary slope angle could be increased to 45°, or 1:1. The report also recommends that temporary slope protection measures should also</p>

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<p>be considered to minimise the risk of spalling. Temporary measures required during cut and fill groundworks will be determined as part of the detailed design and also in the construction methods that will be specified by the appointed contractor. These measures will include measures to ensure any impacts on ground stability at offsite locations are avoided including the adjoining residential and school sites.</p> <p>Management of Stockpiles (soil and other materials / wastes) Segregation and storage of soils for re-use onsite or removal offsite and waste for disposal off site will be segregated and temporarily stored on-site (pending removal or for re-use on-site) in accordance with the CEMP (AECOM, 2022a) and the CDWMP(Enviroguide Consulting, 2022).</p> <p>The reuse of up to 102,159.264cu.m (refer to Table 6 2 and Section 6.5.2) of excavated soil and stone for the Proposed Development (i.e., engineered fill, profiling green areas) will be undertaken in accordance with the engineered design and landscape plan for the Proposed Development. Soil including topsoil and subsoil will be segregated and stored appropriately to prevent deterioration of soil structure and quality to ensure the material will be suitable for re-use onsite. Material surplus to onsite requirements will be segregated and stockpiled appropriately for removal offsite in accordance with the resource and material management plan.</p> <p>For any excavated material identified for removal offsite, while assessment and approval of acceptance at a destination re-use, recovery site or waste facility is pending, excavated soil for recovery/disposal shall be stockpiled as follows:</p> <ul style="list-style-type: none"> • A suitable temporary storage area shall be identified and designated; • All stockpiles shall be assigned a stockpile number; • Material identified for reuse on site, off site and waste materials will be individually segregated; and all segregation, storage & stockpiling locations will be clearly delineated on the Site drawings; • Soil stockpiles will be sealed to prevent run-off from the stockpiled material generation and/or the generation of dust; • Stockpiles will be placed at an appropriate distance from Site boundaries and not at boundaries adjoining sensitive receptors ; • Any waste that will be temporarily stored / stockpiled will be stored on impermeable surface high-grade polythene sheeting, hardstand areas or skips to prevent cross-contamination of the soil below or cross contamination with soil; • The location and moisture content of storage piles are important factors which determine their potential for dust emissions. • Stockpiles will not be located adjoining site boundaries with sensitive receptors including public roads and residential areas; • Overburden material will be protected from exposure to wind by storing the material in sheltered regions of the Site;

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<ul style="list-style-type: none"> • Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust. <p>When a stockpile has been sampled for classification purposes, it shall be considered to be complete and no more soil shall be added to that stockpile prior to removal off site. An excavation/stockpile register shall be maintained on-site</p> <ul style="list-style-type: none"> • Waste will be stored on-site, including concrete, asphalt and soil stockpiles, in such a manner as to: • Prevent environmental pollution (bundled and/or covered storage, minimise noise generation and implement dust/odour control measures, as may be required); • Maximise waste segregation to minimise potential cross contamination of waste streams and facilitate subsequent re-use, recycling and recovery; and • Prevent hazards to site workers and the general public during construction phase (largely noise, vibration and dust). <p>Exportation of Soil</p> <p>All surplus materials and any waste will be removed off-site in accordance with the requirements outlined in the CDWMP (Enviroguide Consulting, 2022) and the CEMP (AECOM, 2022a) and will be managed in accordance with all legal obligations. It will be the contractor's responsibility to either; obtain a waste collection permit or, to engage specialist waste service contractors who will possess the requisite authorisations, for the collection and movement of waste off-site.</p> <p>The re-use of soil offsite will be undertaken in accordance with all statutory requirements and obligations including where appropriate re-use as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended.</p> <p>Any surplus soil not suitable for re-use as a by-product and other waste materials arising from the Construction Phase will be removed offsite by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities. As only authorised facilities will be used, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures.</p> <p>Any waste soils will be transported under a valid waste collection permit issued under the Waste Management (Collection Permit) Regulations 2007, as amended and will be delivered to an appropriately authorised waste management facility.</p> <p>Materials and waste will be documented prior to leaving the Site. All information will be entered into a waste management register kept on the Site. Vehicles transporting material with potential for dust emissions to an off-site location shall be enclosed or covered with a tarpaulin at all times to restrict the escape of dust. Public roads outside the Site shall be regularly inspected for cleanliness, as a minimum on a daily basis, and cleaned as necessary. A road sweeper will be deployed to ensure that public roads are kept free of debris.</p>

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<p>The wheels of all Lorries will be cleaned prior to leaving the Site so that traffic leaving the Site compound will not generate dust or cause the build-up of aggregates and fine material in the public domain.</p> <p>Importation of Aggregates Contract and procurement procedures will ensure that all aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations. The importation of aggregates will be subject to management and control procedures which will include testing and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development including the suitability of material that may be imported in accordance with an Article 27 By-Product Notification. Therefore, any unsuitable material will be identified and avoided prior to importation to the Site.</p> <p>Handling of Chemicals, and Fuel Fuel, oils and other chemicals that could be used during construction can be potentially hazardous to environmental receptors. Storage of fuel, oils and chemicals will be undertaken with a view to protecting any essential services (electricity, water etc.) and the receiving land, soil and geology environment. Storage areas for any fuel, oils and chemicals will be bunded and clearly marked. Fuel will only be stored in the quantities required for emergency use and for re-fuelling as required. All drums to be quality approved and manufactured to a recognised standard. If drums are to be moved around the Site, they will be secured and moved on spill pallets. Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment. Oils and chemicals used and stored on-site will be sealed, secured and stored in a dedicated internally bunded chemical storage cabinet unit or inside concrete bunded areas to prevent any seepage to ground. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.</p> <ul style="list-style-type: none"> • Bunds will have regard to Environmental Protection Agency guidelines 'Storage and Transfer of Materials for Scheduled Activities' (EPA, 2004) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following: • 110% of the capacity of the largest tank or drum within the bunded area; or • 25% of the total volume of substance that could be stored within the bunded area. • Vehicle or equipment maintenance work will take place in a designated impermeable area within the Site; • Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants; • Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<ul style="list-style-type: none"> • In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Site and compliantly disposed off-site in accordance with waste management legislation and the procedures outlined in the CDWMP (Enviroguide Consulting, 2022). <p>Residual soil remaining onsite will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines including 'Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites' (EPA, 2013);</p> <ul style="list-style-type: none"> • Site staff will be familiar with emergency procedures for in the event of accidental fuel spillages; and • All staff on-site will be fully trained on the use of equipment to be used on-site. • Portable generators or similar fuel containing equipment will also be placed on suitable drip trays or bunds. • Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations onsite. Each station will be fully contained and equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed by the Contractor before the commencement of works onsite. <p>A procedure will be drawn up which will be adhered to during refuelling of on-site vehicles. This will include the following:</p> <p>Fuel will be delivered to plant on-site by dedicated tanker;</p> <ul style="list-style-type: none"> • All deliveries to on-site vehicles will be supervised and records will be kept of delivery dates and volumes; • The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur; • Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and • All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area. <p>Concrete Works</p> <p>The cementitious grout used during the construction of the basement drainage channels and connections to the unnamed streams and Greystone Stream in the vicinity of the Site, will avoid any contamination of ground through the use of appropriate design and methods implemented by the Contractor and in accordance with industry standards.</p> <p>All ready-mixed concrete shall be delivered to the Site by truck. Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip. A suitable risk assessment for wet concreting shall be completed prior to works being carried out.</p>

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<p>Water Quality</p> <p><i>Control and Management of Water</i></p> <ul style="list-style-type: none"> • <i>There will be no direct discharges surface water during the Construction Phase.</i> • <i>Groundwater will be encountered during the construction works in particular the basement excavation and cut sections along the western boundary. All excavations will be encompassed by secant pile wall or other specified by the engineer or contractor around the basement excavation to allow dewatering and dry excavation. Robust dewatering methodologies will be developed as part of the detailed design minimise the potential impact on the local groundwater flow regime within the soil and subsoil associated receptors (e.g. springs, water courses and habitats) at the Site and to prevent any impact for habitats and receptors along Site boundaries and offsite that could arise from dewatering. This could include the requirement for discharge of groundwater downgradient of the dewatering works area to minimise any hydrogeological impact on sensitive receptors.</i> • <i>Surface water or groundwater from dewatering will not be directly discharged to water courses.</i> • <i>Discharge of groundwater to ground may be required as part of the dewatering methodology and will be undertaken in accordance with the EPA (2011) 'Guidance on the Authorisation of Discharges to Groundwater'.</i> • <i>Where necessary the water will be treated onsite to remove sediment or other potentially contaminating compounds. The treated water will be tankered offsite or discharged to foul sewer only under licence from IW. Straw bales or silt fences will be appropriately located near water courses to help prevent untreated surface and surface water run-off entering any watercourse. A buffer zone of 10m will be maintained between the silt trap and the watercourse with natural vegetation left intact. The Contractor is to ensure that no contaminated water/liquids leave the Proposed Development Site (as surface water and surface water run-off or otherwise), enter the local drainage system or direct discharge drainage ditches or water courses or springs</i> • <i>A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods where possible.</i> • <i>Any erosion control measures (i.e. silt-traps, silt-fencing and swales) will be regularly maintained during the Construction Phase.</i> • <i>Where water must be pumped from the excavations, water will be managed through robust dewatering and water treatment methodologies in accordance with best practice standards (Construction Industry Research and Information Association, 2016: Groundwater control: design and practice (CIRIA – 750)) and regulatory consents. Water will not be discharged to open water courses) and will be disposed via temporary connection to foul sewer or tinkered offsite</i> • <i>There will be no direct discharge of surface runoff or groundwater from the Proposed Development Site to surface water. Water from the works will be discharged into the public sewer in accordance with the necessary consent from IW. Any such discharge licence is likely to be subject to conditions regarding the flow (rates of discharge, quantity etc.);</i>

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<p><i>effluent quality prior to discharge and pre-treatment (e.g. settlement/filtration, hydrocarbon separation etc.) and monitoring requirements.</i></p> <ul style="list-style-type: none"> <i>A monitoring programme will be implemented to ensure that water quality criteria set out in the discharge licence are achieved prior to discharging to the sewer. The monitoring programme shall be designed by an appropriately qualified Environmental Consultant. Groundwater level monitoring prior to construction as part of the detailed design stage is recommended.</i> <p><i>Management and Control of Works Adjoining Watercourses and Instream</i></p> <ul style="list-style-type: none"> <i>All open water bodies adjacent to areas of proposed works will be protected by fencing including settlement ponds.</i> <i>A 10m buffer is to be retained on either side of the Greystones Stream and the other streams, springs and water courses at the Proposed Development Site and construction works and site traffic will only be permitted within this 10m buffer to facilitate instream works to enable construction of the outfalls, culvert road crossing sections of the Greystones Stream.</i> <i>All instream works or works carried out adjacent to the watercourse, will follow the guidelines published by Inland Fisheries Ireland (IFI) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (2016) and The National Roads Authority (now Transport Infrastructure Ireland) Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes.</i> <i>If temporary crossings are to be constructed, they must be constructed to prevent any erosion of sediment or other potential contamination of surface water taking account of the following:</i> <ul style="list-style-type: none"> <i>The approach and departure routes to temporary crossing structures will be designed and installed so that drainage will fall away from the water course being crossed.</i> <i>Temporary crossing structures will be covered or fenced with terram or similar material to prevent wind blow carrying dusts and other potentially polluting matter to the water course.</i> <i>Side armour will be provided on temporary crossing structures to ensure machinery cannot drive over its edge, or force the discharge of material from the bridge deck to the water course.</i> <i>Temporary crossings will not be repositioned where these are not of a clear span.</i> <i>The creation of fords on rivers through the introduction of stone is prohibited and will not be undertaken.</i> <i>There must be no significant alteration to hydraulic flow within the water course.</i> <i>Instream machine works should be minimised, and any machines working in the watercourse must be protected against leakage or spillage of fuels, oils, greases and hydraulic fluids.</i> <i>Instream earthworks must be executed so as to minimise the suspension of solids.</i> <i>When cofferdams are being kept dry by pumping, the discharge must be routed to an approved settlement facility before return to the river.</i> <i>Every care must be taken to insure against spillage of concrete or leakage of cement grout within cofferdams.</i>

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<p><i>Concrete Works</i></p> <ul style="list-style-type: none"> <i>The use of cementitious grout used during the construction of the basement, piling, drainage and other infrastructure that could result in potential impacts on water quality will be avoided through appropriate design and construction methods that will be implemented by the appointed contractor. The construction methods used by the contractor in accordance with industry standards to prevent impact on groundwater and surface water quality such as the use of water compatible grout.</i> <i>If cast-in-place concrete is required, all work must be carried out in dry conditions and be effectively isolated from any water courses or drainage ditches. Pouring of concrete for aprons, sills, and other works should be carried out in dry conditions and allowed cure for 48 hours before re-flooding. Pumped or tremied concrete should be monitored carefully to ensure no accidental discharge into the watercourses. Concrete works for in-stream works must be carried out in accordance with the procedures outlined in Section 7.8.1.2.</i> <i>The foundation design including the requirement for raft, pad or strip or piled foundations will be determined at detailed design stage. The foundation design and detailed design for other structures (e.g. basement) that may come in contact with water in particular groundwater will include measures as part of the detailed design and contractors method to prevent any potential impact on water quality.</i> <i>All ready-mixed concrete shall be delivered to the Proposed Development Site by truck. Concrete mixer trucks will not be permitted to wash out onsite with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite. A suitable risk assessment for wet concreting shall be completed prior to works being carried out.</i> <p><i>Importation of Soil and Aggregates</i></p> <ul style="list-style-type: none"> <i>Contract and procurement procedures will ensure that all aggregates and fill material required are sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity and compliance standards and statutory obligations.</i> <i>The importation of aggregates will be subject to management and control procedures which will include testing and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development including the suitability of material that may be imported in accordance with an Article 27 By-Product Notification. Therefore, any unsuitable material will be identified and avoided prior to importation to the Site.</i> <p><i>Stockpile Management</i></p> <ul style="list-style-type: none"> <i>Stockpiled soil and stone materials pending removal offsite or reuse onsite will be located in in designated areas only and there will be no storage of materials within 10m of any surface water features/drainage ditches etc. Where</i>

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<p><i>necessary, stockpiles will be surrounded with silt fencing to filter out any suspended solids from surface water arising from these materials.</i></p> <p><i>Handling of Fuels and Hazardous Materials</i></p> <ul style="list-style-type: none"> • <i>There will be no bulk storage of fuels, oils and other chemicals at the Site.</i> • <i>Storage areas for any fuel, oils and chemicals will be bunded and clearly marked. Fuel will only be stored in the quantities required for emergency use. All drums to be quality approved and manufactured to a recognised standard. If drums are to be moved around the Site, they will be secured and moved on spill pallets. Drums will be loaded and unloaded by competent and trained personnel using appropriate equipment.</i> • <i>Oils and chemicals used and stored on-site will be sealed, secured and stored in a dedicated internally bunded chemical storage cabinet unit or inside concrete bunded areas to prevent any seepage to ground. There will be clear labelling of containers so that appropriate remedial measures can be taken in the event of a spillage.</i> <ul style="list-style-type: none"> – <i>Bunds will have regard to Environmental Protection Agency guidelines ‘Storage and Transfer of Materials for Scheduled Activities’ (EPA, 2004) and Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines. All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:</i> <ul style="list-style-type: none"> – <i>110% of the capacity of the largest tank or drum within the bunded area; or</i> – <i>25% of the total volume of substance that could be stored within the bunded area.</i> – <i>Vehicle or equipment maintenance work will take place in a designated impermeable area within the Site;</i> – <i>Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;</i> – <i>Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;</i> – <i>In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Site and compliantly disposed off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and EPA guidelines including ‘Guidance On The Management Of Contaminated Land And Groundwater At EPA Licensed Sites’ (EPA, 2013);</i> – <i>Site staff will be familiar with emergency procedures for in the event of accidental fuel spillages; and</i> – <i>All staff on-site will be fully trained on the use of equipment to be used on-site.</i> – <i>Portable generators or similar fuel containing equipment will also be placed on suitable drip trays or bunds.</i> • <i>Refuelling of plant and vehicles during the Construction Phase will only be permitted at designated refuelling station locations onsite. Each station will be fully contained and equipped for spill response and a specially trained and</i>

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<p><i>dedicated Environmental and Emergency Spill Response team will be appointed by the Contractor before the commencement of works onsite.</i></p> <ul style="list-style-type: none"> • <i>A procedure will be drawn up which will be adhered to during refuelling of on-site vehicles. This will include the following:</i> <ul style="list-style-type: none"> – <i>Fuel will be delivered to plant on-site by dedicated tanker to avoid the requirement for storage onsite;</i> – <i>All deliveries to on-site vehicles will be supervised and records will be kept of delivery dates and volumes;</i> – <i>The driver will be issued with, and will carry at all times, absorbent sheets and granules to collect any spillages that may accidentally occur;</i> – <i>Where the nozzle of a fuel pump cannot be placed into the tank of a machine then a funnel will be used; and</i> – <i>All re-fuelling will take place in a designated impermeable area. In addition, oil absorbent materials will be kept on-site in close proximity to the re-fuelling area.</i> <p><i>Boreholes and Piling</i></p> <ul style="list-style-type: none"> • <i>Existing site investigation boreholes/monitoring wells and supply wells (PW1) that are no longer required at the Site will be decommissioned in accordance with the specifications outlined in EPA Advice Noted 14 (EPA, 2013). This will remove any potential direct conduit for contaminants to enter the groundwater directly.</i> • <i>During piling including bored piles or driven, there is a potential to introduce surface contaminants (by pushing down through the strata) or provide a potential conduit to groundwater for contaminations including existing surface materials or drilling fluids used in piling.</i> • <i>The piling method will include procedures to ensure any potential impact to water quality is prevented including preventing surface runoff or other piling/drilling fluids from entering the pile bores. Where there is a requirement to use lubricants, drilling fluids or additives the contractor will be required to use water-based, biodegradable and non-hazardous compounds.</i> <p><i>Welfare Facilities</i></p> <ul style="list-style-type: none"> • <i>Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations through either a temporary connection to mains foul sewer (subject to receipt of the relevant consent from IW) which will be constructed in accordance with IW and WCC guidelines or by tankering of waste offsite by an appropriately authorised contractor.</i> <p><i>Monitoring</i></p> <p><i>During the construction phase the following monitoring measures will be considered:</i></p>

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<ul style="list-style-type: none"> • Inspections and monitoring will be undertaken during excavations, piling and other groundworks to ensure that measure that are protective of water quality are fully implemented and effective. • Discharges to sewers will be monitoring where required in accordance with statutory consents (discharge licence). • Monitoring and inspection of water courses will be undertaken routinely. • Monitoring of the in-stream works by an appropriately qualified Environmental Clerk of Works will be undertaken and key stages of the works. Monitoring of water courses will be undertaken during the works. • Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with ameliorative, remedial and reductive measures. • Materials management and waste audits will be carried out at regular intervals to monitor the following: <ul style="list-style-type: none"> – management of soils on site and for removal offsite, – record keeping, – traceability of all materials, surplus soil and other waste removed from the site and – ensure records are maintained of material acceptance at the end destination. <p>Air Quality</p> <p><i>Environmental Control Measures</i></p> <p><u>General Air Quality Measures</u></p> <p>Vehicle and Plant Emissions</p> <ul style="list-style-type: none"> • Emissions to the atmosphere, in terms of gaseous and particle pollutants from vehicles and plant used on-site, should be controlled and limited, as far as reasonably practicable, using measures and appropriate control techniques as listed below: • The engines of all vehicles and plant onsite should not be left running unnecessarily (i.e. idling) to minimise exhaust emissions (and noise). • Vehicles and plant shall adhere to applicable emissions standards. • Plant, equipment and emission control apparatus shall be selected to minimise the engine exhaust emissions, taking into consideration economic constraints and practicability. • Enclosed vehicles or tarpaulins shall be used to transport debris, aggregates, and fine materials to and from the site to prevent blow-off of such materials. • Vehicles and plant shall be in good working order and certified where applicable, with servicing completed in line with manufacturer's recommendations. Records of servicing shall be maintained and visual checks carried out to ensure that black smoke is not emitted at times other than at ignition. • Haul routes and plant shall be situated and operated away from sensitive receptors and sensitive core activities associated with operation of other businesses (where possible).

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<ul style="list-style-type: none"> • The use of diesel or petrol-powered generators shall be minimised, with mains electricity or battery powered equipment used as an alternative (where feasible). • Unnecessary vehicle movement and manoeuvring will be avoided, and speed limits will be in place so as to prevent resuspension of particulate matter. • Exhaust emissions of volatile organic compounds, nitrogen oxides, and sulphur oxides from vehicles and machinery will be minimised by avoidance of engines running unnecessarily as idle engines shall not be permitted for excessive periods. • Maximise energy efficiency, which may include using alternative modes of transport, maximising vehicle utilisation by ensuring full loading and efficient routing. <p>Dust Control</p> <p>As with most new builds, a significant proportion of pre-made elements will be brought to the site which reduces the potential for dust emissions. Similarly, typical dust generation sources such as batch concreting is not likely to be carried out. Pre-mixed concrete will be brought to site.</p> <p>The following measures shall be implemented to ensure that dust generation is minimised. The principal objective of measures with regards to dust is to ensure that dust emissions do not cause significant dust soiling on nearby residential receptors:</p> <ul style="list-style-type: none"> • Stockpiles of soil and sub-soil and activities potentially giving rise to soil erosion shall be strictly controlled and maintained as low as possible. • Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind and shorten the length of time for which material will be stockpiled. • Stockpiled material shall be located away (>10m) from surface water features/drainage ditches. • The construction compound area shall have hard standing areas to minimise dust generation from wind-blow. • Hard surfaced areas shall be swept regularly to remove mud and aggregate materials. • In order to minimise the potential for wind-generated emissions from material storage bays, these bays shall be oriented away from the dominant wind direction (west-southwest) to minimise the effects of wind on release of dust and particulate. • Fixed and mobile water sprays shall be used to control dust emissions from material stockpiles and road and yard surfaces as necessary in dry and/or windy weather. • Watering can be utilised to keep unpaved areas moist, preventing dust generation. The required application frequency will vary according to soil type, weather conditions and vehicular use. • Dust suppression techniques will include employment of water bowsers to dampen the site and haul roads, and temporary ceasing of specific operations during unfavourable weather conditions.

Sensitive Receptors	Potential Impacts on SAC	Mitigation Measures to Prevent Impacts on Bray Head SAC
		<ul style="list-style-type: none"> • A wheel-wash shall be available to trucks exiting the site where necessary and used to reduce mud deposition on local roads. • Public roads will be inspected on a daily basis (at a minimum) for cleanliness and cleaned as necessary in order to avoid causing a hazard to road users. • Daily visual observations will be made on fugitive dust levels; in the event of high dust levels, operations giving rise to such emissions will be ceased or curtailed. • A daily inspection programme shall be formulated and implemented in order to ensure that dust control measures are inspected to verify effective operation and management. Daily visual observations will be made on fugitive dust levels; in the event of high dust levels, operations giving rise to such emissions will be ceased or curtailed. • A communication programme with local residents shall be implemented and shall include: <ul style="list-style-type: none"> • Designation of a responsible person for dust management; • Signage displaying contact numbers for person responsible for dust management on the Proposed Development Site; • A complaints logbook or record shall be maintained on site detailing nature of complaint, preventative and corrective actions taken and close-out communication with complainant. <p>Operational Mitigation</p> <p>Biodiversity</p> <ul style="list-style-type: none"> • Post construction an inspection of drainage connections to the watercourse will be carried out by the project ecologist. <p>Land, Soil & Geology</p> <ul style="list-style-type: none"> • There is no requirement for ameliorative, remedial or reductive measures for the Operational Phase of the Proposed Development. <p>Water Quality</p> <ul style="list-style-type: none"> • The design for the basements will incorporate appropriate groundwater drainage design to prevent any issues associated with localised groundwater mounding and hydrostatic pressure. Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures as specified the Infrastructure Report in accordance with CIRIA SuDS Manual C753 (AECOM, 2022b) which will be incorporated into the overall management strategy for the Proposed Development. This will ensure no impacts on water quality and quantity (flow regime) for the Operational Phase of the Proposed Development. • There is no other requirement for mitigation measure for the Operational Phase of the Proposed Development.

Adverse Effects on the conservation objectives of European sites likely to occur from the project (post mitigation)

A robust series of mitigation measures will be carried out. These have been developed by a multidisciplinary project team. These will ensure that there would be no significant downstream effects to the Greystones Stream, the Killruddery/Deerpark Stream or surface water networks, which are the pathways from the proposed development site to Bray Head SAC. Early implementation of ecological supervision on site prior to initial mobilisation and enabling works is seen as an important element to the project, particularly in relation to the implementation of surface water runoff mitigation.

With the successful implementation of the outlined mitigation measures, no significant impacts are foreseen from the construction or operation of the proposed project. Residual impacts of the proposed project will be localised to the immediate vicinity of the proposed works. The construction and operational mitigation proposed for the development satisfactorily addresses the potential impacts on Bray Head SAC through the application of the construction and operational phase controls as outlined above. In particular, mitigation measures to ensure compliance with Water Pollution Acts and prevent silt, dust and pollution entering the Greystones Stream, the Killruddery/Deerpark Stream and surface water networks, will satisfactorily address the potential for adverse effects on the integrity in view of the conservation objectives of Bray Head SAC. No adverse impacts on the conservation objectives of European sites are likely following the implementation of the mitigation measures outlined above. Following the implementation of the mitigation measures outlined, the construction and presence of this development would not be deemed to have an impact on the integrity of Bray Head SAC.

Conclusion

In a strict application of the precautionary principle, it has been concluded that mitigation measures were required to prevent impacts on Bray Head SAC via surface water networks and watercourses. Impacts are likely from the proposed works in the absence of mitigation measures, primarily as a result of the indirect hydrological connection from the site to Bray Head SAC, via the Greystones Stream, Killruddery/Deerpark Stream and surface water networks. As a result, in the absence of mitigation measures there is potential for downstream impacts from the project during site clearance, enabling, construction, landscaping, drainage works and operation.

For this reason, a NIS was carried out to assess whether the proposed project, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of Bray Head SAC. All other European sites were screened out at initial screening.

Mitigation measures will be in place to ensure there will be no impacts on the Greystones Stream, the Killruddery/Deerpark stream and surface water networks that lead to the marine environment and potentially to the Bray Head SAC. A project ecologist will be appointed prior to the commencement of works to oversee the project in relation to the enabling works and the implementation of mitigation measures as outlined on site. The implementation of mitigation measures outlined, which will be followed, will be sufficient to prevent adverse effects on the integrity of Bray Head SAC.

Following the implementation of the mitigation measures outlined, the construction and presence of this development would not be deemed to have an impact on the integrity of Bray Head SAC. No impacts are likely on Bray Head SAC, alone in combination with other plans and projects based on the implementation of standard construction phase mitigation measures.

This report presents a NIS for the proposed development. It outlines the information required for the competent authority to determine whether or not the proposed development, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the Bray Head SAC.

On the basis of the content of this report, the competent authority is enabled to conduct an Appropriate Assessment and consider whether the project, either alone or in combination with other plans or projects, in view of best scientific knowledge and in view of the sites' conservation objectives, will adversely affect the integrity of the European site.

Data Used for NIS

NPWS site synopses and Conservation objectives of sites within 15km were assessed. The most recent SAC and SPA boundary shapefiles were downloaded and overlaid on ESRI road maps and satellite imagery.

References

The following references were used in the preparation of this AA screening report.

1. Department of Environment Heritage and Local Government Circular NPW 1/10 and PSSP 2/10 on Appropriate Assessment under Article 6 of the Habitats Directive – Guidance for Planning Authorities March 2010.
2. Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities, Department of the Environment, Heritage and Local Government 2009;
http://www.npws.ie/publications/archive/NPWS_2009_AA_Guidance.pdf
3. Managing NATURA 2000 Sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC, European Commission 2000;
http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/provision_of_art6_en.pdf
4. Assessment of Plans and Projects Significantly Affecting NATURA 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
http://ec.europa.eu/environment/nature/Natura2000management/docs/art6/Natura_2000_assess_en.pdf
5. Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission;
http://ec.europa.eu/environment/nature/Natura2000/management/docs/art6/guidance_art6_4_en.pdf
6. Guidance document on the implementation of the birds and habitats directive in estuaries and coastal zones with particular attention to port development and dredging;
http://ec.europa.eu/environment/nature/Natura2000/management/docs/guidance_doc.pdf
7. The Status of EU Protected Habitats and Species in Ireland.
http://www.npws.ie/publications/euconservationstatus/NPWS_2007_Conservation_Status_Report.pdf
8. NPWS (2017) Conservation Objectives: Bray Head SAC 000714. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
9. EC (2021) Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC
https://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm

Appendix I Habitat and flora assessments

Habitat and flora assessments were carried out on the 31st August 2020 and the 31st August 2021. Habitats within the proposed development site were classified according to Fossitt (2000) (Figure AI-1) based on the 31st August 2021 survey and the flora species noted within each habitat are described.

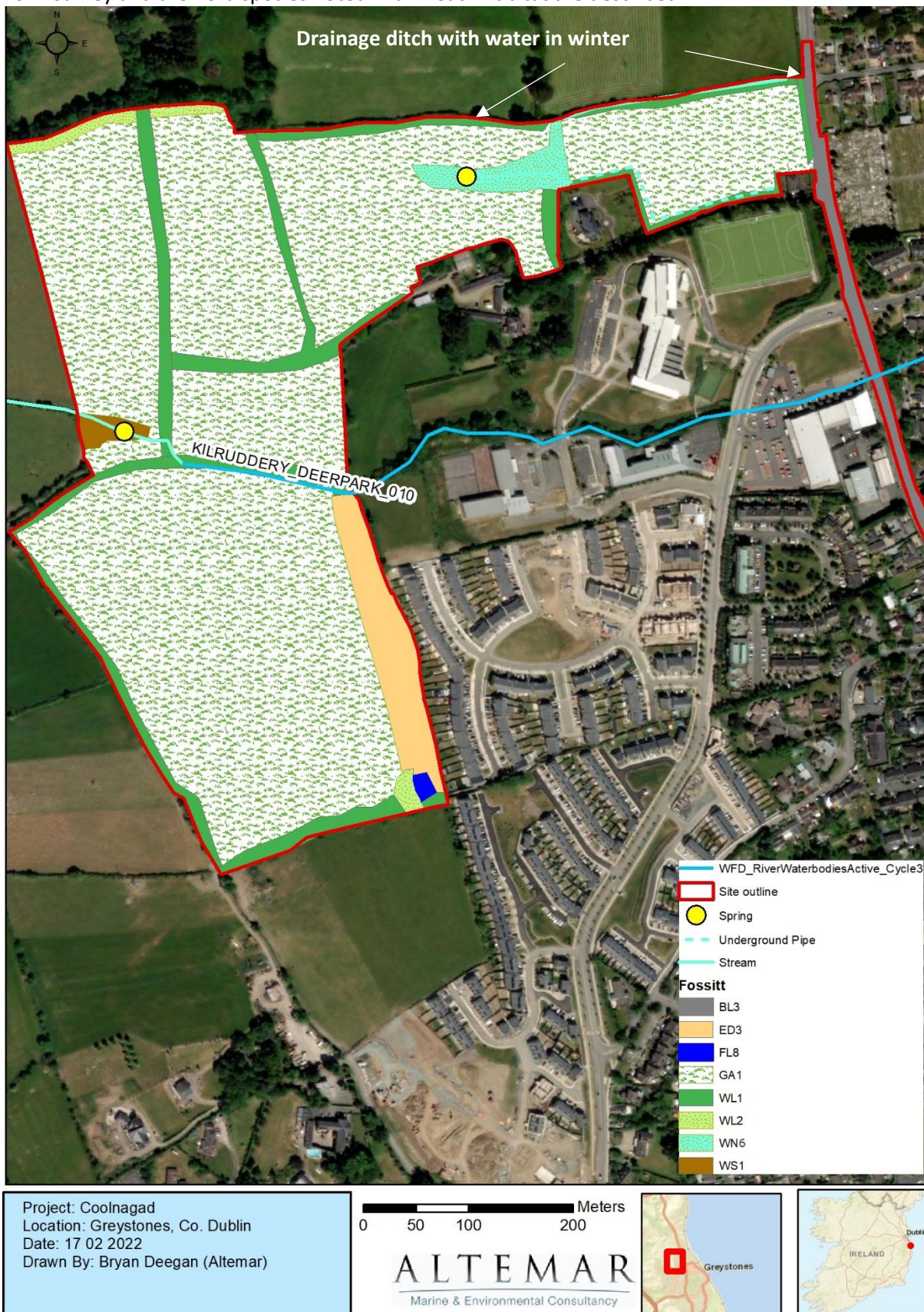


Figure AI-1. Fossitt Habitats on site (See habitat descriptions for Fossitt codes below)



Plate 1. Agricultural grassland.

GA1-Improved Agricultural Grassland

The vast majority of the proposed development site consists of agricultural grassland which forms part of an active farm. As seen in Figure 4.6 the proposed site comprises of six fields divided by hedgerows. Flora species in GA1 consisted of creeping buttercup (*Ranunculus repens*), lesser stitchwort (*Stellaria graminea*), white clover (*Trifolium repens*), red clover (*Trifolium pratense*), dandelion (*Taraxacum spp.*), daisy (*Bellis perennis*), Common Ragwort (*Jacobaea vulgaris*), plantains (*Plantago spp.*), thistles (*Cirsium vulgare*), docks (*Rumex spp.*) Lesser Centaury (*Centaureum pulchellum*) and nettle (*Urtica dioica*). At the edges of this habitat Rosebay Willowherb (*Epilobium angustifolium*), gorse (*Ulex europaeus*), bramble (*Rubus fruticosus*) and oxeye Daisy (*Leucanthemum vulgare*).



Plate 2. Hedgerows.

WL1- Hedgerows

A series of native hedgerows are located within and around the boundary of the site. These appeared to have been un managed for several years and has a bramble scrub at their base. Species including elder (*Sambucus nigra*), blackthorn (*Prunus spinosa*), hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*), dog-rose (*Rosa canina*), Gorse (*Ulex europaeus*), bramble (*Rubus fruticosus agg.*), ash (*Fraxinus excelsior*), ivy (*Hedera helix*), hazel (*Corylus avellana*), goat willow (*Salix caprea*), sycamore (*Acer pseudoplatanus*), wild cherry (*Prunus avium*), honeysuckle (*Lonicera periclymenum*) and cleavers (*Galium aparine*) were noted. Hedgerows in the proximate to development also included cotoneaster (*Cotoneaster Sp*), bracken (*Pteridium aquilinum*), griselinia (*Griselinia littoralis*) and buddleia (*Buddleia davidii*).

WL2 Treelines

The north eastern boundary of the site consists of a tall treeline. Tree species in this area included sycamore (*Acer pseudoplatanus*), beech (*Fagus sylvatica*) Scots pine (*Pinus sylvestris*), ash (*Fraxinus excelsior*), silver fir (*Abies alba*), hornbeam (*Carpinus betulus*). In addition to the taller trees were hawthorn (*Crataegus monogyna*), holly (*Ilex aquifolium*), ivy (*hedera helix*) nettle (*Urtica dioica*), dandelion (*Taraxacum spp.*), plantains (*Plantago spp.*), thistles (*Cirsium arvense* & *C. vulgare*), docks (*Rumex spp.*), bramble (*Rubus fruticosus*) and lords and ladies (*Arum maculatum*). During winter months the water table appeared quite high in this area and there is a potential overflow pathway from the pond to the west of the site along the northern boundary of the site to the Greystones Road.

WS1 (Scrub)

In the central portion of the western boundary of site a small area contained scrub (WS1)(Fossitt, 2000). This area appeared to be an abandoned area of land that is poached by cattle. This area is dominated by gorse (*Ulex europaeus*). It is important to note that a spring (the official EPA source of the Greystones Stream) is within the scrub area.



Plate 3. Recolonising bare ground.

ED3 Recolonising Bare ground.

Areas of the site had begun to recolonise following site recent works in the past. Based upon an examination of recent satellite imagery this area was a hedgerow up to June 2018 and works had been carried out in this area between 2018 and 2020. Species noted included rape (*Brassica napus*), oxeye daisy (*Leucanthemum vulgare*), great willowherb (*Epilobium hirsutum*), thistles (*Cirsium arvense*, *C. vulgare*), common ragwort (*Senecio*

jacobaea), moss (*Spagnum sp.*), docks (*Rumex spp.*), plantains (*Plantago spp.*), nettle (*Urtica dioica*), cat's-ear (*Hypochaeris radicata*) and common fumitory (*Fumaria officinalis*).



Plate 4. Eroding Upland rivers

FW1- Eroding Upland rivers

The Greystones Stream travels through the site. The official source (EPA) of the stream is within a scrub area within the proposed development site. However, a spring is noted further uphill (Figure 5.5.) and water flows from the spring at a high elevation to the official source. Even though the spring within the scrub area is considered to be the official source (EPA) it is evident that the spring further uphill is the actual source of the stream. As a result the 10m buffer for biodiversity protection that has been applied to the watercourse will also apply to the flow of water from the spring uphill from the official commencement of the watercourse.

The stream passing through the site is small, fast flowing and is heavily tunneled. The bed of the stream consists of gravel and rocks. No instream biodiversity was noted. It should be noted however, that this stream is of little fisheries value, as it is heavily tunneled, culverted downstream (under the Lidl shopping centre, sections of Redford Park and proximate roads), and descends a very steep gradient into the marine environment just north of Darcy's Field in Greystones where sedimentary cliffs are suffering from erosion. It is possible, as the watercourse is small, spring fed and at the top of its catchment, that the channel may become dry over long extended dry periods. However, this was not observed during the site assessments. Notwithstanding this, the watercourse does provide an important biodiversity corridor through the site, and a minimum of a 10m biodiversity corridor is required under Inland Fisheries Guidance.



Plate 5. Other artificial lakes and ponds.

FL8- Other artificial lakes and ponds.

On the south eastern corner of the site is a small pond area in what appears to be a small disused quarry. The water in this pond appears to fluctuate as no emergent or aquatic vegetation was noted and terrestrial vegetation was submerged on one occasion. No biodiversity was noted in this pond. However, the pond could potentially form a from breeding site for frogs.



Plate 6. Wet willow-alder-ash woodland

WN6-Wet willow-alder-ash woodland.

Located in the centre of the site is a small area of the habitat Wet willow-alder-ash woodland. This broad category includes woodlands of permanently waterlogged sites that are dominated by willows (*Salix* spp.). This area is fed by a spring (Figure 4.6). During the summer this area goes dry while in winter (Plate 6) the area is waterlogged. Other species included Yellow Iris (*Iris pseudacorus*) and mosses (sphagnum). This area would be considered to be a locally important wetland area due the potential for the habitat to support frogs and a nesting habitat for breeding birds.

Invasive Species

No invasive plant or animal species listed under the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477 of 2011) Section 49, the Third Schedule: Part 1 Plants, Third Schedule: Part 2A Animals were noted on site. No terrestrial or aquatic invasive species such as Japanese knotweed, giant rhubarb, Himalayan balsam, giant hogweed etc. that could hinder removal of soil from the site during groundworks were noted.

Fauna Assessments

Mammal assessments were carried out on the 6th November 2020, 26th February 2021, and the 7th January 2022. Bat surveys including bat emergent/detector survey were also carried out on the 31st August 2020 and the 31st August 2021.

Terrestrial Mammals

Three mammal assessments were carried out. No signs of badger activity or an active sett were noted on site. Tracks of sika deer (*Cervus nippon*), rabbit (*Oryctolagus cuniculus*), fox (*Vulpes vulpes*) were noted on site. In addition, sika deer (*Cervus nippon*) were observed in the field nearest to the R761 and have been noted frequently on site by the landowner. Sika deer are considered non-native but are protected under the Wildlife Act. Sika deer can be hunted under a section 29 licence granted by the National Parks and Wildlife Service. No mammal species of conservation importance have been noted on site during surveys or by NBDC or NPWS data.

Amphibians and Reptiles

No amphibians or reptiles were noted on site. However, given the fact that there is a watercourse, springs, wet woodland and a pond on site, it is highly likely that frogs are present on site. These habitats would be considered locally important primarily due to the likelihood of the habitats to support frogs.

Birds

Birds noted on site were recorded during site assessments. Specific wintering bird walkover assessments were carried out on 6th November 2020, 26th February 2021, 27th March 2021, 7th January 2022 and 20th January 2022. The following bird species were noted on site during the site assessments (**Table AI-1**). It should be noted that the qualifying interests of designated sites were not noted on site during site assessments. It is not considered that the proposed development site is an ex-situ site for designated sites. The site consists of relatively long agricultural grassland. No qualifying interests were identified on the site.

Common Name	Scientific Name	Conservation Status ⁵
Woodpigeon	<i>Columba palumbus</i>	Green
Robin	<i>Erithacus rubecula</i>	Green
Great Tit	<i>Parus major</i>	Green
Wren	<i>Troglodytes troglodytes</i>	Green
Rook	<i>Corvus frugilegus</i>	Green
Wren	<i>Troglodytes troglodytes</i>	Green
Jackdaw	<i>Corvus monedula</i>	Green
Robin	<i>Erithacus rubecula</i>	Green

⁵ Birds of Conservation Concern in Ireland 2020-2026 <https://birdwatchireland.ie/app/uploads/2021/04/BOCCI4-leaflet-2-1.pdf>

Common Name	Scientific Name	Conservation Status ⁵
Chaffinch	<i>Fringilla coelebs</i>	Green
Hooded Crow	<i>Corvus cornix</i>	Green
Magpie	<i>Pica pica</i>	Green
Chiffchaff	<i>Phylloscopus collybita</i>	Green
Goldcrest	<i>Regulus regulus</i>	Green
Blackbird	<i>Turdus merula</i>	Green
Song Thrush	<i>Turdus philomelos</i>	Green
Redwing	<i>Turdus iliacus</i>	Green
Blue Tit	<i>Cyanistes caeruleus</i>	Green
Coal Tit	<i>Parus ater</i>	Green
Goldfinch	<i>Carduelis carduelis</i>	Green
Duncock	<i>Prunella modularis</i>	Green
Buzzard	<i>Buteo buteo</i>	Green

Table AI-1. Species of Birds noted during on-site surveys.

Bats

The bat assessment is seen in Appendix I. There were no seasonal or climatic constraints as survey was undertaken within the active bat season in good weather conditions with daytime temperatures of greater than 10°C after dark. Winds were very light and there was no rainfall. No evidence of a definitive bat roosts were found in any of the onsite trees. However, several trees of bat roosting potential were noted on site. Foraging activity of three bat species (soprano pipistrelle (*Pipistrellus pygmaeus*), Leisler's bat (*Nyctalus leisleri*) and common pipistrelle (*Pipistrellus pipistrellus*), were noted on site. Foraging activity was noted primarily along treelines and hedgerows with activity being greater on the northern portion of the site. Please see Appendix I for further information.

Discussion Species and habitats

As can be seen from **Figure AI-1** the proposed development site consists primarily of Improved agricultural grassland (GA1) and hedgerows (WL1), scrub (WS1) and treelines (WL2). No flora or habitats of National or international conservation importance were noted on site during the surveys. No invasive flora species were noted on site. No flora species of conservation importance or invasive species were noted on site by the NPWS or NBDC or during site surveys. No amphibians or reptiles were noted on site. However, given the favourable habitats on site for frogs it would be expected that the wetland, riparian, spring and pond habitats would be locally important. Native hedgerows were noted on site. These would also be seen to be locally important to biodiversity. In relation to bird species no bird species on Annex I of the EU Birds Directive were noted on site by NPWS or NBDC. The watercourse (acting as a biodiversity corridor), drainage ditches, springs, wetland, pond, hedgerows and treelines would be seen as the most important habitats on site. These elements form refuges and food sources for local biodiversity and provide biodiversity corridors to the surrounding areas. It should be noted that prior to the commencement of the design stage of this project, the local biodiversity value of these habitats was noted. As a result, the proposed development has been designed around the retention of these habitats and biodiversity corridors where possible.