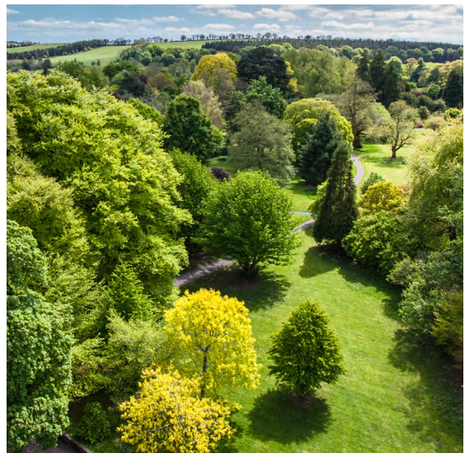

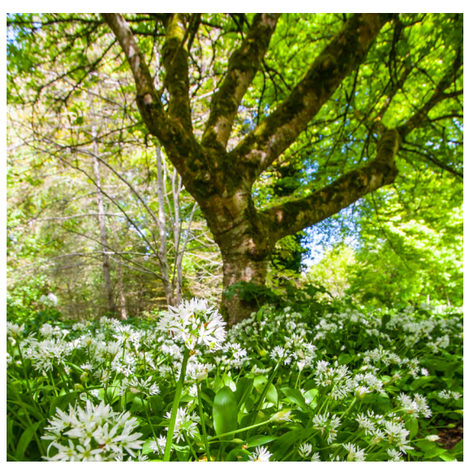

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APPENDIX 9

Biodiversity

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APPENDIX 9-1

Biodiversity Survey Schedule – Kelleher Ecology Services

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Appendix 9-1 Biodiversity Survey Schedule.

Date	Time 24hrs	Survey	Weather	Ecologist
27.02.19	11.45 - 12.05 (HT 11.20)	Initial site appraisal in relation to its potential suitability for waterbird qualifying interests of Cork Harbour SPA, walkover completed around high tide.	Dry, Cloud 8/8 Okta, Wind F0, Good visibility.	Katherine Kelleher
29.05.19	06.30 - 07.30	Bird transects (early season), mammal walkover, other taxa casual observations.	Dry, Cloud 8/8 Okta, Wind F1, Good Visibility	Katherine Kelleher
28.06.19	10.00 - 15.00	Habitat and botanical survey.	Mist & Drizzle, Cloud 8/8 Okta, Wind F1, Good Visibility	Michelle O'Neill
18.07.19	07.35 - 09.50	Bird transects (late season), mammal walkover, other taxa casual observations, deployment of mammal trail cameras C1 & C2	Dry, Cloud 7/8 Okta, Wind F1-2, Good Visibility	Katherine Kelleher
16.08.19	18.30	Collection of mammal trail cameras C1 & C2 and deployment of passive bat detectors P1-3.	Dry, Cloud 4/8 Okta, Wind F2, Good Visibility	Katherine Kelleher
20.08.19	17.40 - 19.00	Collection of passive bat detectors P1-3 and deployment of passive detectors P4 & P5, casual observations.	Dry, Cloud 4/8 Okta, Wind F1-2, Good Visibility	Katherine Kelleher
26.08.19	18.15 - 19.00	Collection of passive bat detectors P4 & P5.	N/A	Katherine Kelleher

Date	Time 24hrs	Survey	Weather	Ecologist
09.04.21	11.00 - 14.50	Habitat and botanical survey, hedgerow appraisal, mammal walkover, deployment of mammal trail cameras C2 & C3, visual appraisal of bat roosting potential of on-site stone buildings/structures.	Dry, Cloud 7/8 Okta, Wind F0-1, Good Visibility	Katherine Kelleher, Michelle O'Neill
06.06.21	12.00	Collection of mammal trail cameras C2 & C3.	Dry, Cloud 1/8 Okta, Wind F0-1, Good Visibility	Katherine Kelleher
10.06.21	21:35 - 23:53 (Sunset: 21:53)	Active bat dusk emergence survey at unoccupied house.	Dry, light drizzle for last 10 minutes; Cloud 7/8; Wind F1; Temp: 14-13ºC	Isobel Abbott, Einne O'Cathasaigh
25.06.21	03:15 - 05:15 (Sunrise: 05:15)	Active bat dawn return survey at unoccupied house.	Dry, Cloud 3/8; Wind F0; Temp: 10-11ºC	Isobel Abbott, Einne O'Cathasaigh
30.08.21	10.45 - 19.15	Bat roost potential survey of trees due for removal	Dry, Cloud 7/8; Wind F3; Good Visibility	Domhnall Finch
13.09.21	14.00 - 17.45	Bat roost potential survey of trees due for removal	Occ. Showers, Cloud 8/8; Wind F2; Good Visibility	Domhnall Finch

Trail Camera	Dates Running	Nights Running	Location
C1	18th July - 13th August 2019	26	IW 77382 73771
C2	18th July - 16th August 2019	29	IW 77205 73866
	9th April - 22nd April 2021	13	IW 77205 73866
C3	9th April - 22nd May 2021	43	IW 77405 73757

Passive Bat Detector	Dates Deployed	Nights Analysed	Location
P1	16th August - 20th August 2019	2 nights	IW 77340 73894
P2	16th August - 20th August 2019	2 nights	IW 77318 73736
P3	16th August - 20th August 2019	2 nights	IW 77249 73500
P4	20th August - 26th August 2019	2 nights	IW 77310 73410
P5	20th August - 26th August 2019	2 nights	IW 77339 73358

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APPENDIX 9-2

Biodiversity Evaluation Scheme - Kelleher Ecology Services

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Appendix 9-2 Biodiversity Evaluation Scheme[1].

Biodiversity Evaluation Criteria

International Importance:

- 'European Site 'including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation.
- Proposed Special Protection Area (pSPA).
- Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended).
- Features essential to maintaining the coherence of the Natura 2000 Network.
- Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive.
- Resident or regularly occurring populations (assessed to be important at the national level*) of the following:
  - Species of bird listed in Annex I and/or referred to in Article 4(2) of the Birds Directive and/or;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive.
- Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971).
- World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972).
- Biosphere Reserve (UNESCO Man & The Biosphere Programme).
- Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979).
- Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979).
- Biogenetic Reserve under the Council of Europe.
- European Diploma Site under the Council of Europe.
- Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
- Major salmon river fisheries.

National Importance:

- Site designated or proposed as a Natural Heritage Area (NHA).
- Statutory Nature Reserve.
- Refuge for Fauna and Flora protected under the Wildlife Acts.
- National Park.
- Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park.
- Resident or regularly occurring populations (assessed to be important at the national level*) of the following:
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing 'viable areas'** of the habitat types listed in Annex I of the Habitats Directive.
- Major trout river fisheries.
- Commercially important coarse fisheries.
- Waterbodies with major amenity fishery value.

[1] amended after NRA 2009 and Nairn & Fossitt 2004

Biodiversity Evaluation Criteria

County Importance:

- Area of Special Amenity^.
- Area subject to a Tree Preservation Order^.
- Area of High Amenity^, or equivalent, designated under the County Development Plan.
- Resident or regularly occurring populations (assessed to be important at the County level*) of the following:
  - Species of bird listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.
- County important populations of species, or viable areas** of semi-natural habitats or natural heritage features identified in the National or Local Biodiversity Action Plan (BAP) if this has been prepared.
- Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.
- Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.
- Small waterbodies with known salmonid populations or with good potential salmonid habitat.
- Large waterbodies with some coarse fisheries value.

Local Importance (higher value):

- Locally important populations of priority species or habitats or natural heritage features identified in the Local BAP if this has been prepared.
- Resident or regularly occurring populations (assessed to be important at the Local level*) of the following:
  - Species of bird listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;
  - Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;
  - Species protected under the Wildlife Acts; and/or
  - Species listed on the relevant Red Data list.
- Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality.
- Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.
- Small waterbodies with some coarse fisheries value or some potential salmonid habitat.
- Waterbodies with unpolluted 'High' water quality status (Q4-5, Q5).

Local Importance (lower value):

- Sites containing small areas of semi-natural habitat that are of some local importance for wildlife.
- Sites or features containing non-native species that are of some importance in maintaining habitat links.

Biodiversity Evaluation Criteria
▪ Waterbodies with no current fisheries value, no significant potential fisheries value, poor fisheries habitat.

* A general suggestion is that 1% of the national population of such species qualifies as an internationally or nationally or county or locally important population. However, a smaller population may qualify as internationally important where the population forms a critical part of a wider population or the species is at a critical phase of its life cycle.

** A ‘viable area’ is defined as an area of a habitat that, given the particular characteristics of that habitat, was of a sufficient size and shape, such that its integrity (in terms of species composition, and ecological processes and function) would be maintained in the face of stochastic change (for example, as a result of climatic variation).

^ It should be noted that whilst areas such as Areas of Special Amenity, areas subject to a Tree Preservation Order and Areas of High Amenity are often designated on the basis of their ecological value, they may also be designated for other reasons, such as their amenity or recreational value. Therefore, it should not be automatically assumed that such sites are of County importance from an ecological perspective.

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APPENDIX 9-3

Invasive Third Schedule Plants Management Plan - Kelleher Ecology Services

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INVASIVE ALIEN PLANT SPECIES :
SITE ASSESSMENT REPORT & MANAGEMENT PLAN

RESIDENTIAL DEVELOPMENT LANDS AT LACKENROE, GLOUNTHAUNE, CO. CORK

FOR

BLUESCAPE LIMITED

16 SEPTEMBER 2021 | ISSUE 2 FINAL

CONTENTS

DOCUMENT NAME	STATUS	REV	DATE	COMMENT	AUTHOR	CKD.
CO-03-21/SARMP/00	DRAFT	00	04/06/2021	ISSUED FOR COMMENTS	KYRAN COLGAN	K.C.
CO-03-21/SARMP/01	ISSUE 1	01	03/09/2021	GENERAL REVISIONS	KYRAN COLGAN	K.C.
CO-03-21/SARMP/02	ISSUE 2	02	16/09/2021	FINAL REVISIONS	KYRAN COLGAN	K.C.

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I.A.P.S. SITE ASSESSMENT REPORT & MANAGEMENT PLAN

RESIDENTIAL DEVELOPMENT LANDS, GLOUNTHAUNE, CO. CORK								
PROJECT NO.	CO-03-21	**GPS POSITION : ITM**	**X**	577195	**Y**	573892	**AUTHOR**	MR. KYRAN COLGAN

EXECUTIVE SUMMARY

Invasive Plant Solutions have been retained by Bluescape Limited, to provide IAPS (invasive alien plant species) consultancy services in relation to a land holding in the townland of Lackenroe, Glounthaune, Co. Cork. The majority of the land holding is currently in agricultural use, but with the most southerly part of the holding comprising of a mix of woodland habitat and unoccupied residential use.

Proposals are being considered in relation to the future development of the lands, which currently envisage an integrated mixed residential scheme occupying the main body of the lands, with secondary development and pedestrian connections to Glounthaune village provided via routes through the woodland zone occupying the southern sector of the land holding. These proposals have been developed to a stage whereby Statutory Consents can be sought in the near future, but the outcome of such a process, and specific timelines for any future development, are currently unknown.

This IAPS Site Assessment Report and Management Plan represents the first stage of an ongoing programme of IAPS consultancy services, the scope of which is designed and intended to deliver the safe, bio-secure and comprehensive management of all identified invasive alien plant species. The evolving Management Plan will include any necessary remediation measures that may be required to satisfy this purpose, in circumstances where the land is approved for development.

An initial I.A.P.S. survey was carried out on the 24th. May 2021, which falls within the optimum window in 2021 for surveying for the presence of IAPS. The data and information contained in this document is therefore as up to date as is reasonably possible, and therefore forms a reliable basis for the implementation of a realistic and deliverable IAPS management programme.

The management plan has been developed with reference to *The Management of Noxious Weeds and non-native Invasive Species on National Roads"* by NRA (2010), *Best Practice Management Guidelines* by Invasive Species Ireland (2008) and the UK Environment Agency's *The Knotweed Code of Practice : Managing Japanese Knotweed on Development Sites.* In applying the latter's planning matrix, as well as the "precautionary principle", we can conclude that the IAPS management will initially consist of a combination of three specific measures, as follows :

- Deployment of initial bio-security measures, including fencing of certain infested zones and the fitting of warning / advisory signage
- Multi Annual in-situ herbicide control of certain IAPS infestations, particularly Knotweeds, Three Cornered Garlic and Spanish Bluebell
- On-site physical remediation of certain other IAPS infestations, particularly Rhododendron and American Skunk Cabbage

Based on the outcome of the project development process, including the planning approval and detailed design stages, assessed in conjunction with the overall phasing and timing of any construction works, and with ongoing site monitoring and treatment in the interim, this IAPS Management Plan will be developed and expanded upon. A "construction stage" document will further refine the IAPS management process and will set out the detailed bio-security requirements and individual remediation measures to be deployed at each IAPS location, during the delivery phase of any proposed development.

KYRAN COLGAN
Director

16 SEPTEMBER 2021

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I.A.P.S. SITE ASSESSMENT REPORT

SECTION 1 : GENERAL INTRODUCTION

The Site Assessment Report has been prepared for the client / agency referenced in Section 2 below, and is for their sole and exclusive use. The report reflects the particular site circumstances and conditions, as they presented on the days of inspection. Depending on the time of year of the site assessment, particularly if carried out in advance of the annual IAPS growing season, the evidence of invasive plant species on site may be limited. In these circumstances follow up site inspections, later in the growing season, may be recommended. This will be included in Conclusions and Recommendations at Section 13 of the report.

By their nature, IAPS are aggressive interlopers in our native habitat, are capable of aggressive and rapid dominance, and if left untreated generally result in extensive habitat impairment. It is therefore reasonable to conclude that, where IAPS are identified, but control measures are not applied, these plant species will spread beyond their observed extents.

In addressing invasive alien plant species the precautionary principle should always be applied to their assessment, management and control. All recommended management and control measures should be carried out strictly in accordance with a Site Specific Management Plan, and follow "best practice" principles, as set out in technical reference documents such as the UK Environment Agency's *The Knotweed Code of Practice, The Management of Noxious Weeds and non-native Invasive Species on National Roads"* by NRA (2010), and *Best Practice Management Guidelines* by Invasive Species Ireland (2008)

Control measures should be implemented using a recognised professional service with expertise in this field of work, and take into account any and all sensitivities highlighted in the site assessment report. Particular care should be taken in circumstances where the invasive plant species are located within a designated site of ecological importance, such as an SAC, SPA or NHA, or are set within the context of known ecological sensitivities. Where the use of herbicides are proposed, these should be applied strictly in accordance with the manufacturers recommendations, by a registered Professional Pesticides User, and fully in compliance with the European Communities (Sustainable Use of Pesticides) Regulations, 2012, (S.I. 155 of 2012).

Under no circumstances should any IAPS be cut or dug out without the advice, direction and supervision of an invasive species specialist. Many plant species have extensive root / rhizome systems which spread beyond the footprint of the above ground plant, and some can regenerate themselves from very small fragments of root or stem. Some plants produce very substantial quantities of seeds, which remain viable for many years, while others produce a sap which causes severe skin damage & burns.

The off-site removal of Japanese knotweed, its variants, soil infested with knotweed material, and other IAPS, are all strictly controlled by legislation and require a licence from the National Parks and Wildlife Service in advance of their removal, in accordance with the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477).

SECTION 2 : LEGISLATIVE CONTEXT

Japanese Knotweed, *Fallopia japonica*, and other invasive plant species, are listed as Invasive Alien Plant Species in Part 1 of the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations* 2011 (SI 477 of 2011, as amended). In addition, soils and other material containing Knotweeds are classified in Part 3 of the Third Schedule as vector materials and are subject to the same strict legal controls. Failure to comply with the legal requirements set down can result in either civil or criminal prosecution, with very severe penalties accruing. A person who commits an offence under Regulations 49 & 50 is liable (a) on summary conviction, to a Class A fine or imprisonment for a term not exceeding six months, or both, or (b) on conviction on indictment, to a fine not exceeding €500,000, or imprisonment for a term not exceeding three years, or both. A person who knowingly incites, directs, procures, permits or assists another person to carry out an action that is an offence under these Regulations shall also be guilty of an offence. The relevant sections of the regulations are reproduced below.

49(2) *Save in accordance with a licence granted* [by the Department of Arts, Heritage and the Gaeltacht]*, any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place* [a restricted non-native plant]*, shall be guilty of an offence.*

49(3) *… it shall be a defence to a charge of committing an offence under paragraph (1) or (2) to prove that the accused took all reasonable steps and exercised all due diligence to avoid committing the offence.*

50(1) *Save in accordance with a licence, a person shall be guilty of an offence if he or she* […] *offers or exposes for sale, transportation, distribution, introduction or release—*

(a) [any restricted non-native animal or plant species]*,*

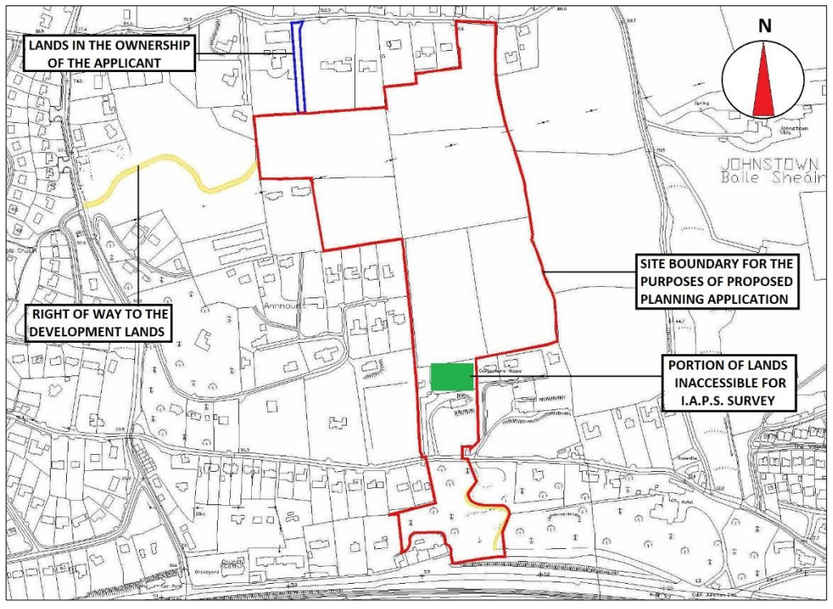
(b) *anything from which an animal or plant referred to in subparagraph (a) can be reproduced or propagated, or*

(c) *a vector material listed in the Third Schedule,* [which includes] *soil or spoil taken from places infested with Japanese Knotweed….and its hybrids…*

It is an offence under regulations 49(2) and 50(1) to spread, or cause to spread, Japanese Knotweed and other IAPS. An offence may only be avoided if the relevant party can prove that they took all reasonable steps to avoid causing an offence under the legislation. To comply with these regulations, therefore, this management plan relies solely on methodologies necessary to ensure strict compliance with the legislation.

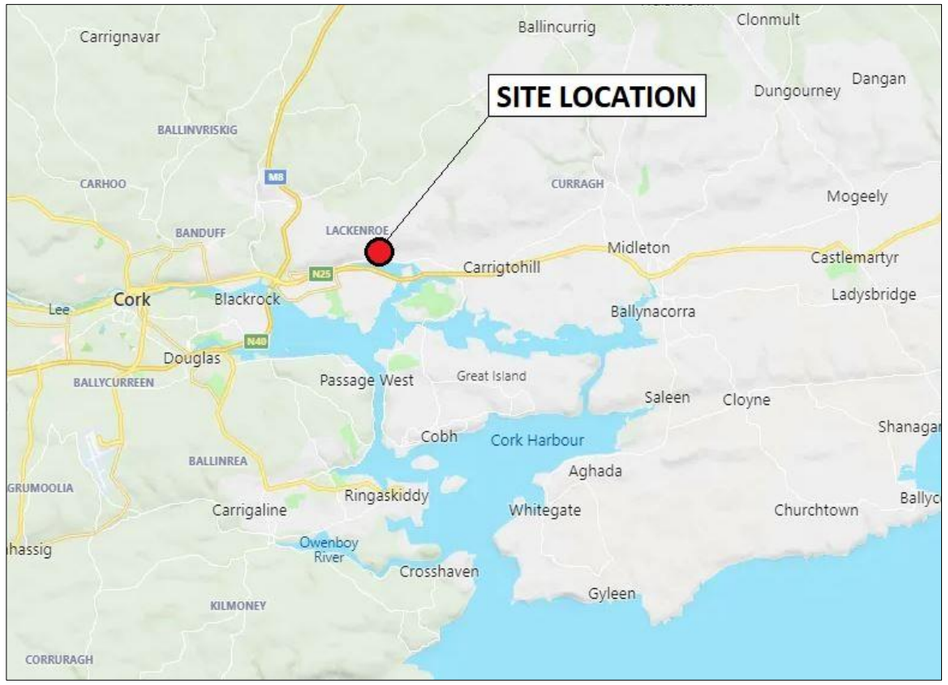
SECTION 3 : CLIENT & SITE DETAILS

GENERAL DETAILS													
SITE ADDRESS	LACKENROE, GLOUNTHAUNE, CO. CORK												
CLIENT DETAILS	**BLUESCAPE LIMITED** 12 MERRION SQUARE DUBLIN 2 IRELAND						**OWNERSHIP**	PUBLIC		PRIVATE	X		
							CLIENT REP.	MR. PAUL Mc. CARTHY					
							TEL / EMAIL	087 233 8991 / paul@westhilluk.com					
STATE AGENCIES INVOLVED	CO. COUNCIL		NPWS		IFI		IRISH WATER		BORD NA MONA				
	ESB		IRISH RAIL		GNI		OTHER						
CONSULTANTS / AGENTS	**ARCHITECTS – DEADY GAHAN ARCHITECTS** EASTGATE VILLAGE RETAIL PARK LITTLE ISLAND CO. CORK **ECOLOGICAL CONSULTANTS – KELLEHER ECOLOGY SERVICES** CASTLELYONS CO. CORK												
SITE USAGE	AGRICULTURAL	X	FORESTRY		RESIDENTIAL	X	COMMERCIAL		INDUSTRIAL				
	PUBLIC SPACE		GREENFIELD	X	BROWNFIELD		OTHER						
SITE AREA	Lands outlined in Red : 12.69 Ha. + Lands outlined in Blue : 0.13 Ha. = Total Site Area : 12.82 Ha.												
SITE DESCRIPTION	THE SUBJECT SITE COMPRISES A LARGE, PRIMARILY GREENFIELD, SOUTH FACING AGRICULTURAL LAND HOLDING, EXTENDING FROM THE L3004 OLD YOUGHAL ROAD, ON THE EAST SIDE OF GLOUNTHAUNE VILLAGE, IN THE SOUTH, AND RUNNING UPHILL TO THE NORTH AND WEST. THE BULK OF THE LANDS ARE LAID OUT IN WELL ESTABLISHED FIELD DIVISIONS, ACCESSED VIA EXISTING AND PROPOSED ROADWAYS TO THE NORTH AND WEST. THE WESTERN ACCESS PIONT IS A FUTURE ROADWAY, TO BE BUILT AND ROUTED ACROSS EXISTING AGRICULTURAL LANDS, AND DELINIATED IN YELLOW ON THE MAP REPRODUCED BELOW. THE SOUTHERN PORTION OF THE LAND HOLDING CONSISTS OF TWO DISUSED RESIDENTIAL PROPERTIES ON INDIVIDUAL SITES, LOCATED ON THE NORTH SIDE OF "THE TERRACE" PUBLIC ROADWAY, AND A TRANCH OF MIXED NATIVE WOODLAND, EXTENDING FROM THE SOUTHERN SIDE OF "THE TERRACE" PUBLIC ROAD DOWNHILL TO THE SOUTHERN LIMITS OF THE OVERALL LAND HOLDING, ON THE PEDESTRIAN WALKWAY JUST NORTH OF THE L3004. A SMALL SECTION OF FORMER GARDENS PROVED TO BE INACCESSIBLE FOR THE PURPOSE OF THIS ASSESSMENT, AND IS ILLUSTRATED ON THE MAP BELOW. THE LAND HOLDING IS BOUNDED BY PRIVATE RESIDENTIAL AND COMMERCIAL PROPERTIES TO THE SOUTH, WEST, AND NORTH, AND BY A MIX OF AGRICULTURAL FIELDS AND PRIVATE RESIDENTIAL PROPERTIES TO THE EAST SITE BOUNDARIES ARE GENERALLY WELL DEFINED AND DEMARCATED, IN A COMBINATION OF STONE AND MASONRY WALLS, NATIVE HEDGES AND FENCING. THE LANDS ARE CURRENTLY BEING ASSESSED AND CONSIDERED FOR A POTENTIAL RESIDENTIAL DEVELOPMENT												



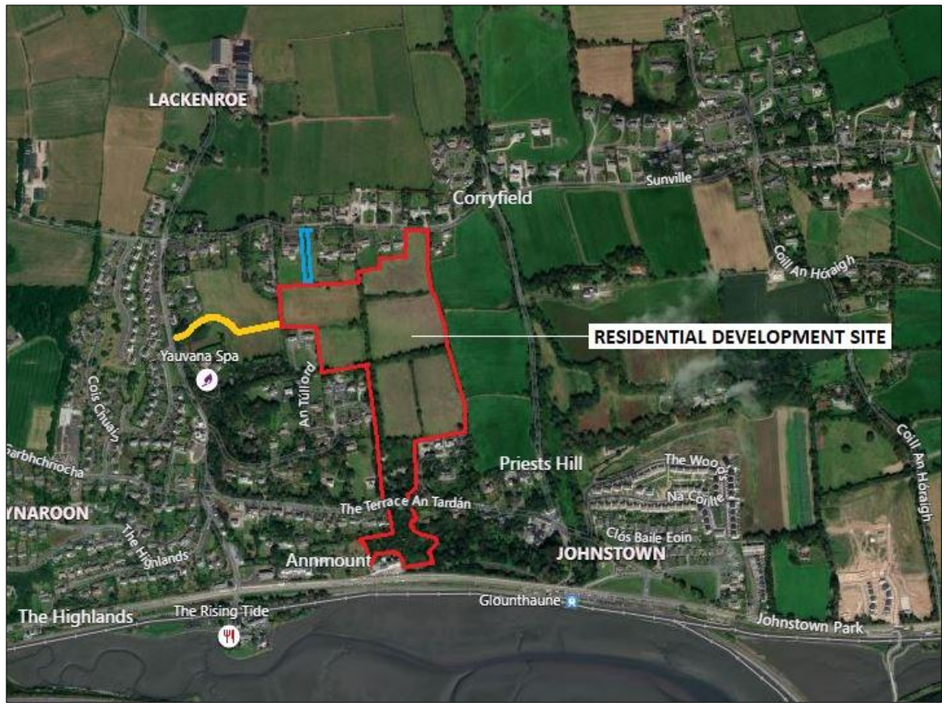
LAND HOLDING MAP REPRODUCED COURTESY OF DEADY GAHAN ARCHITECTS

SECTION 4 : SITE LOCATION MAP & AERIAL SITE LAYOUT



SITE LOCATION MAP

SITE LOCATION MAP REPRODUCED COURTESY OF BING MAPS



AERIAL SITE LAYOUT

AERIAL SITE LAYOUT REPRODUCED COURTESY OF BING MAPS

SECTION 5 : SCOPE OF I.A.P.S. SURVEY

The scope and purpose of the I.A.P.S. Survey was to:

- Confirm presence, or otherwise, and extent of Japanese Knotweed and its hybrids within, or in close proximity to, the site forming the study area
- Confirm the presence, or otherwise, of any other I.A.P.S. within or in close proximity to, the site forming the study area
- Use the survey results to inform the preparation of an I.A.P.S. Site Assessment Report
- Use the survey results to inform the preparation of an I.A.P.S. Management Plan, particularly in relation to any necessary bio-security and control measures that may be required

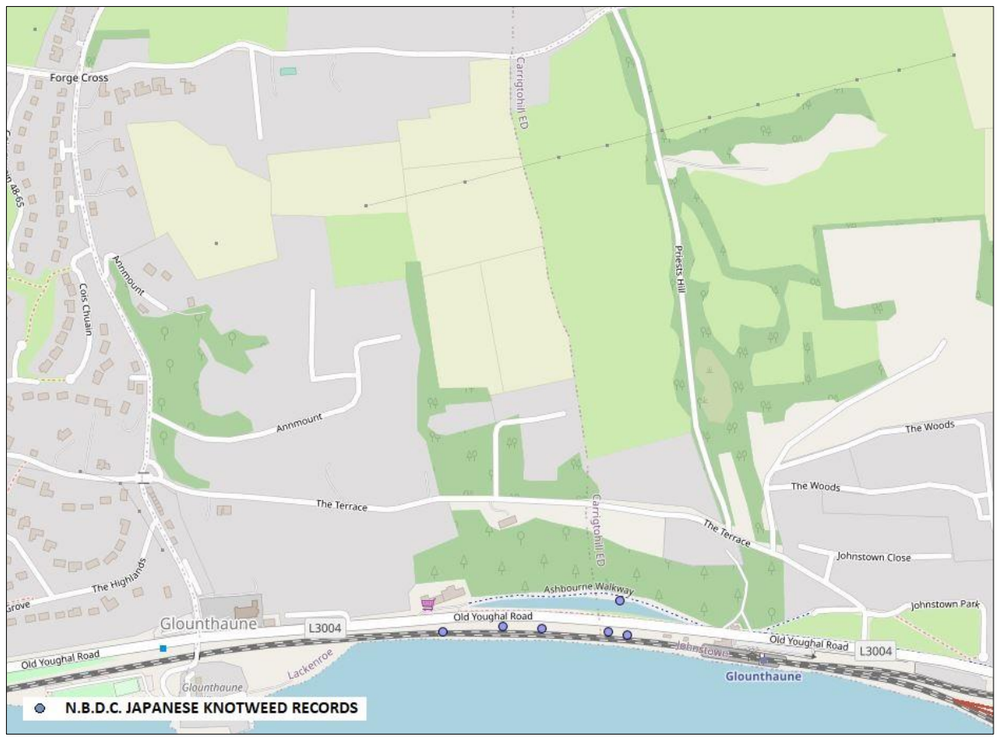
SECTION 6 : BACKGROUND RESEARCH

A desktop study was carried out in May 2021, to identify any formal records that may exist for the presence of land based I.A.P.S., as set out in Part 1, Schedule 3, of S.I. 477 of 2011, within for the study area.

The National Biodiversity Data Centre (NBDC) invasive species database and mapping system were reviewed, covering the study area, the immediately surrounding lands, and the broader hinterland.

The search of the NBDC invasive alien plant species database yielded no records of the presence of land based I.A.P.S. within the survey area itself. However there are a number of IAPS records located in the broader hinterland, generally relating to the railway line which runs parallel, and to the south, of the L3004 Old Youghal Road, itself just south of the subject site. These records relate primarily for the presence of Japanese Knotweed, but also include a small number of records for Bohemian and Giant Knotweed plants. For reference, we have reproduced below the NBDC map record for the nearest Japanese Knotweed sites, as recorded between 2000 and 2021.

In addition we also referred to various open source mapping, satellite imaging, and data sets, including Land Direct, Geohive, NPWS Map Viewer, Google Maps and Bing Maps



MAPPING RECORDS OF JAPANESE KNOTWEED IN THE VICINITY OF THE SURVEY AREA, 2001- 2021

MAP REPRODUCED COURTESY OF NATIONAL BIODIVERSITY DATA CENTRE

SECTION 7 : I.A.P.S. OVERALL INFESTATION DETAILS

INVASIVE ALIEN SPECIES							
JAPANESE KNOTWEED		GIANT KNOTWEED		BOHEMIAN KNOTWEED	X	HIMALAYAN KNOTWEED	X
GUNNERA		HIMALAYAN BALSAM		GIANT HOGWEED		RHODODENDRON	X
AMERICAN SKUNK CABBAGE	X	THREE CORNERED GARLIC	X	SPANISH BLUEBELL	X	HOTTENTOT FIG	

DESCRIPTION & EXTENT OF KNOTWEED COLONISATIONS

BOHEMIAN KNOTWEED – **BK 1**

BK 1 IS A STAND OF HEALTHY, EMERGING, BOHEMIAN KNOTWEED WITHIN THE WOODLAND ZONE FORMING THE SOUTHERN SECTOR OF THE LANDS. THE STAND IS LOCATED JUST NORTH AND WEST OF SUNKEN STONE STRUCTURE, CLOSE TO A RECENTLY FORMED ACCESS ROUTE THROUGH THE WOODLAND TO THE LOWEST SECTION OF THE SITE. THE BOHEMIAN KNOTWEED IS ALMOST FULLY EMERGED FOR THIS GROWING SEASON, WITH STEMS UP TO 1.5M – 2M IN HEIGHT, AND WITH SMALLER STEMS PRESENTING AROUND THE PERIPHERY OF THE STAND. THERE IS NO EVIDENCE OF DEAD CANES FROM PREVIOUS SEASONS GROWTH, SUGGESTING THAT THE STAND COULD BE PART OF A PREVIOUSLY DORMANT INFESTATION, OR POSSIBLY GROWTH FROM RHIZOME THAT WAS PREVIOUSLY INTRODUCED ONTO THE SITE IN SPOIL MATERIAL, AND WHICH WAS ACTIVATED BY THE RECENT SITE CLEARANCE ACTIVITIES

BOHEMIAN KNOTWEED – **BK 2**

JK 2 IS A STAND OF BOHEMIAN KNOTWEED LOCATED APPROX. 12M TO THE EAST OF **BK 1,** AND IS EXHIBITING SIMILAR CONDITIONS AND CHARACTERISTICS. IT IS POSSIBLE THAT THE TWO STANDS ARE CONNECTED GROWTH ORIGINATING FROM THE SAME REPOSITORY OF RHIZOME MATERIAL CONTAINED WITHIN THE GROUND IN THIS GENERAL AREA. FURTHER INVESTIGATION IS REQUIRED TO DETERMINE THE PRECISE CIRCUMSTANCES OF THE TWO STANDS

HIMALAYAN KNOTWEED – **HK 1**

HK 1 IS A LARGE MONOLITHIC STAND OF RECENTLY EMERGENT HIMILAYAN KNOTWEED LOCATED IN THE SAME SOUTHERN SECTOR, NORTH OF **BK 1**. THE STAND IS PARTIALLY ON THE RECENTLY FORMED ACCESS TRACK, BUT WITH THE MAIN BODY OF THE STAND EXTENDING TO THE WEST, UP THE SLOPING BANK IN OPEN GROUND. AS WITH THE OTHER STANDS, THERE IS NO EVIDENCE OF DEAD STEMS FROM PREVIOUS SEASONS GROWTH.

HIMALAYAN KNOTWEED – **HK 2**

HK 2 COMPRISES A SERIES OF JUVENILE AND IMMATURE HIMALAYAN KNOTWEED SHOOTS, IMMEDIATELY NORTH, AND TO THE WEST, OF **BK 2**, SCATTERED ACROSS THE RECENTLY DISTURBED OPEN GROUND. IT IS EARLY IN THE GROWING SEASON, SO ITS FULL EXTENT MAY NOT YET BE FULLY REPRESENTED.

DESCRIPTION & EXTENT OF OTHER I.A.P.S. COLONISATIONS

THREE CORNERED GARLIC – **TCG 1 & TCG 3**

TCG 1 & TCG 3 ARE LINEAR STANDS OF WELL ESTABLISHED THREE CORNERED GARLIC, SPREADING WITHIN AND ALONG ROADSIDE VERGES

THREE CORNERED GARLIC – **TCG 2**

TCG 2 IS A SMALL STAND OF THREE CORNERED GARLIC, LOCATED WITHIN THE NATIVE HEDGEROW SEPARATING FIELDS IN THE NORTHERN SITE SECTOR

THREE CORNERED GARLIC – **TCG 4, TCG 5, TCG 6 & TCG 7**

TCG 4 - TCG 7 ARE A SERIES OF STANDS OF WELL ESTABLISHED THREE CORNERED GARLIC, SPREADING WITHIN THE NORTHERN PART OF THE WOODLAND THAT FORMS THE SOUTHERN SITE SECTOR, AND ALONG BOTH SIDES OF THE PEDESTRIAN RIGHT OF WAY ON THE WOODLAND'S EASTERN FRINGE

SPANISH BLUEBELL – **SB 1**

SB 1 IS A SMALL GROUP OF SPANISH BLUEBELL PLANTS SCATTERED THROUGH NATIVE VEGETATION. LOCATED IN THE RECENTLY FORMED CLEARANCE IN THE NORTHERN SECTOR OF THE WOODLAND, WHICH FORMS THE SOUTHERN SECTOR OF THE LAND HOLDING

THREE CORNERED GARLIC & SPANISH BLUEBELL – **TCG/SB 1, TCG/SB 2 & TCG/SB 3**

TCG/SB 1, TCG/SB 2 & TCG/SB 3 ARE EXTENSIVE ZONES OF MIXED INFESTATIONS OF BOTH THREE CORNERED GARLIC AND SPANISH BLUEBELL, LOCATED ON THE GROUNDS OF THE TWO RESIDENTIAL PROPERTIES ON THE NORTH SIDE OF "THE TERRACE" PUBLIC ROAD. THE STANDS ARE TYPICALLY WELL ESTABLISHED AND ARE MIXED AND SPREADING AMONGST NATIVE VEGETATION. THERE IS EVIDENCE OF SOME SPERAD INTO THE FIELDS TO THE NORTH

THREE CORNERED GARLIC & SPANISH BLUEBELL – **TCG/SB 4, TCG/SB 5 & TCG/SB 6**

TCG/SB 4, TCG/SB 5 & TCG/SB 6 ARE A SERIES OF MIXED STANDS OF WELL ESTABLISHED THREE CORNERED GARLIC AND SPANISH BLUEBELL, SPREADING WITHIN THE WOODLAND THAT FORMS THE SOUTHERN SITE SECTOR, PARTICULARLY ALONG THE ROADSIDE MARGIN ON ITS NORTHERN FRINGE AND ALONG BOTH SIDES OF THE PEDESTRIAN RIGHT OF WAY ON THE WOODLAND'S SOUTH EASTERN MARGINS

RHODODENDRON – **RHO 1 & RHO 2**

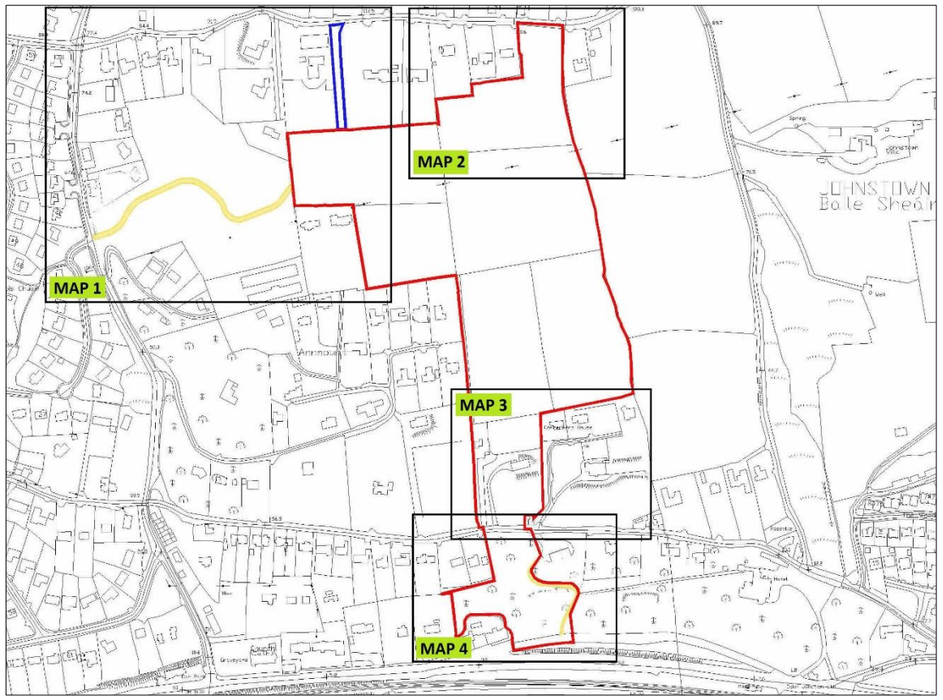
RHO 1 & RHO 2 ARE TWO HEALTH AND MATURE RHODODENDRON TREES, LOCATED IN THE GROUNDS OF THE LARGE DISUSED RESIDENTIAL PROPERTY, ON THE NORTH SIDE OF "THE TERRACE" PUBLIC ROAD. **RHO 1** IS LOCATED CLOSE TO SOUTHERN END OF THE PROPERTY'S EASTERN BOUNDARY, WHILE **RHO 2** IS IN THE WESTERN SECTOR OF THE PROPERTY, IN LINE WITH THE ENTRANCE POINT TO THE SITE. THE TWO TREES ARE CURRENTLY IN FLOWER.

AMERICAN SKUNK CABBAGE – **ASC 1**

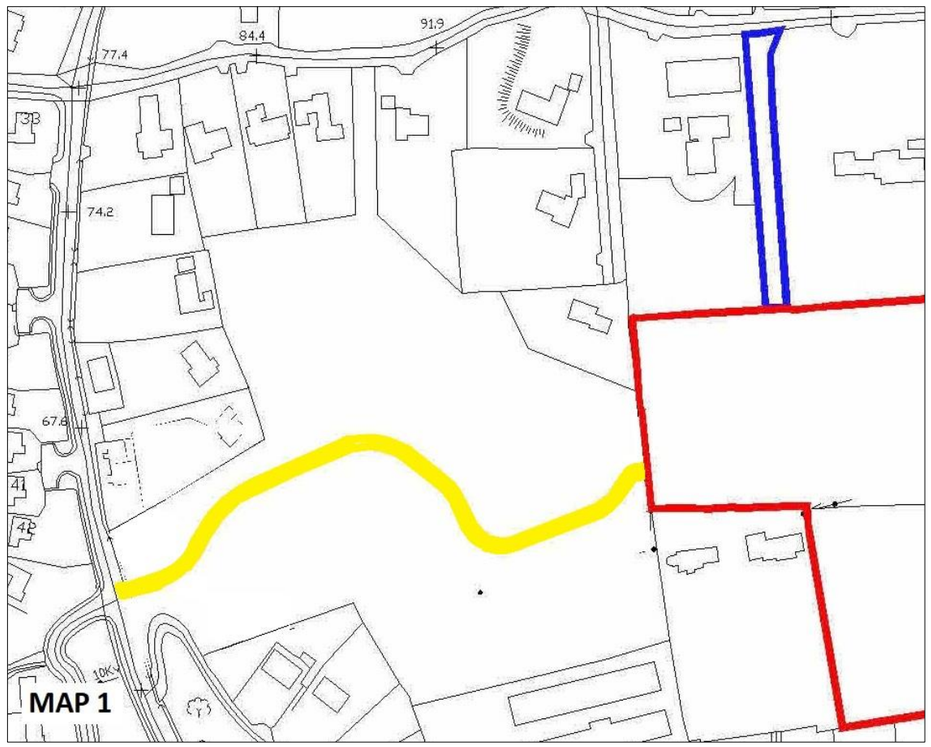
ASC 1 REPRESENTS AN AREA OF AMERICAN SKUNK CABBAGE, COMPRISING APPROX 10 PLANTS, AT VARYING STAGES OF PLANT GROWTH. THEY ARE LOCATED IN A LOW LYING WET GROUND, WITHIN THE SOUTHERN SITE SECTOR, APPROX 20M NORTH OF THE BOEMENIAN KNOTWEED STANDS

CONDITION OF INFESTATIONS									
GROWTH STAGE	EMERGENT	X	REGROWTH		JUVENILE / SEMI MATURE	X	MATURE	X	
CONDITION	HEALTHY	X	DISTRESSED		STUNTED		BONSAI		
RISKS FROM PLANTS									
BOUNDARIES	X	SOFT LANDSCAPE	X	HARD SURFACES		SITE DISPERSAL	X	SENSITIVE HABITATS	X

SECTION 8 : I.A.P.S. DISTRIBUTION MAPS



OVERALL SITE LAYOUT WITH KEY TO I.A.P.S. DISTRIBUTION MAPS

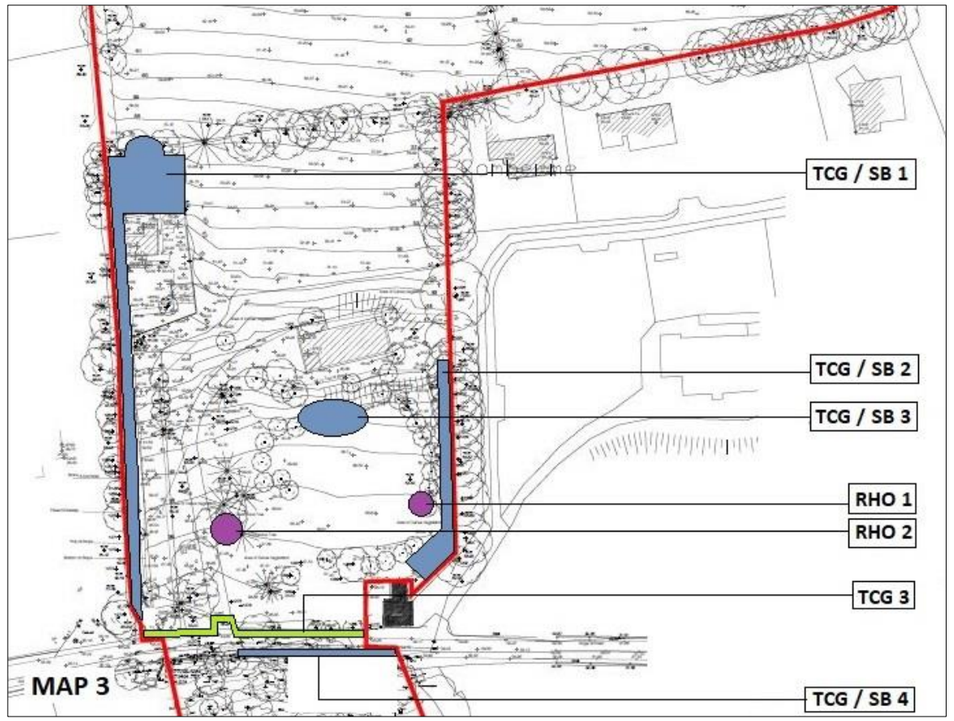


I.A.P.S. DISTRIBUTION MAP 1

MAPS REPRODUCED COURTESY OF DEADY GAHAN ARCHITECTS

SECTION 8 : I.A.P.S. DISTRIBUTION MAPS – CONTD.

I.A.P.S. DISTRIBUTION MAP 2



I.A.P.S. DISTRIBUTION MAP 3

MAPS REPRODUCED COURTESY OF DEADY GAHAN ARCHITECTS

SECTION 8 : I.A.P.S. DISTRIBUTION MAPS – CONTD.

I.A.P.S. DISTRIBUTION MAP 4

MAPS REPRODUCED COURTESY OF DEADY GAHAN ARCHITECTS

SECTION 9 : I.A.P.S. INDIVIDUAL INFESTATION DETAILS

DETAILS	NO.	ITM – X *	ITM – Y *	SIZE (M X M)	COMMENTS
INFESTATION 1	BK 1	577279	573379	+/- 5m dia.	Emergent, distressed stems on periphery
INFESTATION 2	BK 2	577290	573375	+/- 4m x 3m	Emergent, distressed stems on periphery
INFESTATION 3	HK 1	577279	573397	+/- 10m x 6m	Emergent, section on trackway disturbed
INFESTATION 4	HK 2	577286	573380	+/- 4m x 3m	Just emerging, in disturbed ground
INFESTATION 5	TCG 1	577253 to 577302	574098 to 574102	+/- 50m x 1m	On roadside margin, on south side of public Road
INFESTATION 6	TCG 2	577155	573962	+/- 2m dia.	Within hedgerow at crossing point between fields
INFESTATION 7	TCG 3	577209 to 577263	573500 to 573503	+/- 55m x 5m	On roadside margin and spreading into the main property entrance, on north side of public road
INFESTATION 8	TCG 4	577259	573475	+/- 5m x 12m	In woodland clearing, spreading south
INFESTATION 9	TCG 5	577277	573467	+/- 7m x 5m	Under large tree in woodland, spreading south
INFESTATION 10	TCG 6	577276 to 577283	573412 to 573431	+/- 18m x 1m x 2	Both side of pathway, around right hand bend
INFESTATION 11	TCG 7	577236	573439	+/- 2m x 1m	In woodland clearing
INFESTATION 12	SB 1	577256	573456	+/- 3m dia.	In woodland clearing
INFESTATION 13	TCG/SB 1	577205 to 577209	573503 to 573625	+/- 100m x 1m x 2 + +/- 16m x 20m	Both sides of driveway and in open ground behind house, spreading into the field to the north
INFESTATION 14	TCG/SB 2	577274 to 577281	573512 to 573569	+/- 60m x 5 - 10m	
INFESTATION 15	TCG/SB 3	577254	573556	+/- 6m x 3m	Spreading through vegetation at woodland fringe
INFESTATION 16	TCG/SB 4	577232 to 577270	573490 to 573491		On roadside margin, on south side of public Road
INFESTATION 17	TCG/SB 5	577324	573426	+/- 15m x 2m	Both side of pathway, around left hand bend
INFESTATION 18	TCG/SB 6	577313 to 577315	573369 to 583396	+/- 8m x 20m	
INFESTATION 19	RHO 1	577275	573533	+/- 4m dia.	Currently in full flower
INFESTATION 20	RHO 2	577222	573531	+/- 6m dia.	Currently in full flower
INFESTATION 21	ASC 1	577301	573402	+/- 3m x 2m	

* Many of the invasive alien plant species recorded are located within woodland or close to dense canopy cover. Therefore some of the GIS co-ordinates could have a significant margin of error, which should be taken consideration when implementing IAPS management measures. Their exact location and extent should be validated on the ground, and clearly demarcated, using an invasive alien plant species specialist.

SECTION 10 : I.A.P.S. - ENVIRONMENTAL IMPACT AND LOCAL SENSITIVITIES

ENVIRONMENTAL CONTEXT								
VISUAL IMPACT	MINIMAL		MODERATE	X	SIGNIFICANT		SEVERE	
ENVIRONMENTAL IMPACT	LIMITED		MODERATE		SIGNIFICANT	X	SEVERE	
TRANSLOCATION RISK	LOW		MEDIUM		HIGH	X	ACUTE	
PROXIMITY TO WATER BODY	DISTANT		VICINITY	X	ADJOINING		WITHIN	
NATURE OF WATER BODY	RIVER		SEA	X	LAKE		CHANNEL	X
DESIGNATED STATUS								
IS SITE IN A DESIGNATED AREA	SAC	**NO**	SPA	**NO**	NHA / pNHA	**NO**	NO.	**N/A**
DESIGNATED AREA NEARBY	SAC	**YES**	SPA	**YES**	NHA / pNHA	**YES**	NO.	**001058 / 004030**
OTHER SENSITIVITIES								

COMMENTS / NOTES

DESIGNATED SITES

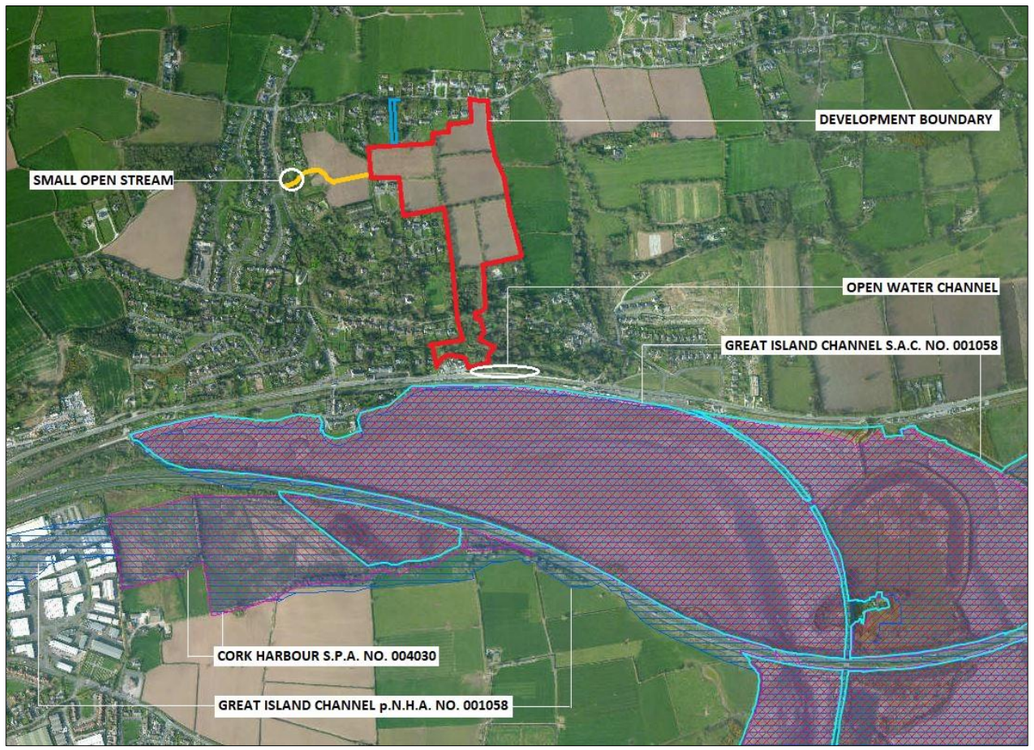
THE NEAREST DESIGNATED SITES ARE **THE GREAT ISLAND CHANNEL S.A.C. NO.001058** AND **THE CORK HARBOUR S.P.A. NO.004030,** BOTH OF WHICH ARE A SHORT DISTANCE TO THE SOUTH OF THE SOUTHERN SITE BOUNDARY, WITH THEIR NORTHERN LIMITS LOCATED JUST SOUTH OF THE CORK TO MIDDLETON RAILWAY LINE, ITSELF SOUTH OF THE L3004 OLD YOUGHAL ROAD.

OTHER SENSITIVITIES

AS WELL AS THE PRESENCE OF THE ABOVE DESIGNATED SITES THERE IS AN ASSOCIATED STREAM / DRAINAGE DYKE LOCATED BETWEEN THE SOUTHERN SITE BOUNDARY AND THE NORTH SIDE OF THE OLD YOUGHAL ROAD. IN ADDITION, THERE IS THE FORMATION OF A SMALL STREAM WHICH PRESENTS ABOVE GROUND AND FOLLOWS THE GENERAL LINE OF THE WESTERNMOST SECTION OF THE PROPOSED WESTERN ACCESS ROAD.

GIVEN THE PROXIMITY OF THE OPEN WATER BODIES CLOSE TO, OR ON, THE LAND HOLDING, AS WELL AS THE DESIGNATED SITES IMMEDIATELY TO THE SOUTH OF THE PROPERTY, THERE MAY BE POTENTIAL PATHWAYS FOR HERBICIDES, WHICH COULD HAVE AN IMPACT ON KNOWN ECOLOGICAL SENSITIVITIES OR RECEPRORS WITHIN THE DESIGNATED SITES

MAPS / ILLUSTRATIONS



RELATIONSHIP BETWEEN THE SITE & THE CLOSEST DESIGNATED SITES

MAPS REPRODUCED COURTESY OF THE N.P.W.S. MAPVIEWER FACILITY

SECTION 11 : SITE PHOTOGRAPHS

BOHEMIAN KNOTWEED – BK 1

VIEW OF STAND – LOOKING WEST

VIEW OF STAND – LOOKING NORTH

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

BOHEMIAN KNOTWEED – BK 2

VIEW OF STAND – LOOKING SOUTH

VIEW OF STAND – LOOKING NORTH

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

BOHEMIAN KNOTWEED – BK 1 & BK 2

DETAIL OF HEALTHY PLANT STEMS AND LEAVES

DETAIL OF DELAYED OR DISTRESSED GROWTH

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

HIMILAYAN KNOTWEED – HK 1

VIEW OF STAND – LOOKING NORTH EAST

VIEW OF STAND – LOOKING NORTH WEST

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

HIMILAYAN KNOTWEED – HK 1

VIEW OF EASTERN END OF THE STAND ON, AND CROSSED BY, A VEHICLE TRACK – LOOKING NORTH

VIEW OF EASTERN END OF THE STAND ON, AND CROSSED BY, A VEHICLE TRACK – LOOKING NORTH

CLOSE UP OF EMERGING NEW SEASON GROWTH

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

HIMILAYAN KNOTWEED – HK 2

HEALTHY ENERGENT NEW SEASON GROWTH IN DISTURBED GROUND – LOOKING NORTH

DELAYED OR DISTRESSED NEW SEASON GROWTH IN DISTURBED GROUND – LOOKING WEST

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC – TCG 1

ROADSIDE MARGIN – LOOKING WEST

THREE CORNERED GARLIC MIXED AMONGST NATIVE VEGETATION IN ROADSIDE MARGIN

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC – TCG 2 & TCG 3

THREE CORNERED GARLIC MIXED AMONGST NATIVE VEGETATION IN HEDGEROW AT TCG 2

ROADSIDE MARGIN AT TCG 3 CONTAINING THREE CORNERED GARLIC – LOOKING WEST

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC – TCG 4 & TCG 5

THREE CORNERED GARLIC MIXED AMONGST NATIVE VEGETATION IN WOODLAND CLEARING AT TCG 4

THREE CORNERED GARLIC AROUND THE BASE OF A TREE IN THE SOUTHERN WOODLAND AT TCG 5

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC – TCG 6 & TCG 7

THREE CORNERED GARLIC ON THE SIDE OF THE PATH ALONG THE EASTERN WOODLAND FRINGE AT TCG 6

THREE CORNERED GARLIC ON THE SIDE OF THE VEHICLE TRACK THROUGH THE SOUTHERN WOODLANDS AT TCG 7

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

SPANISH BLUEBELL – SB 1

TYPICAL SPANISH BLUEBELL PLANTS IN THE WODLAND CLEARING AT SB 2

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC & SPANISH BLUEBELL – TCG/SB 1

THREE CORNERED GARLIC AND SPANISH BLUEBELL INTERMITTENTLY ON BOTH SIDES OF DRIVEWAY AT TCG/SB 1

GROUND TO THE REAR (NORTH) OF THE HOUSE HEAVILY COLONISED BY THREE CORNERED GARLIC AT TCG/SB 1

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC & SPANISH BLUEBELL – TCG/SB 2 & TCG/SB 3

THREE CORNERED GARLIC AND SPANISH BLUEBELL SPREADING THROUGH NATIVE VEGETATION AT TCG/SB 2

SPANISH BLUEBELL SPREADING THROUGH NATIVE VEGETATION AT TCG/SB 3

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC & SPANISH BLUEBELL – TCG/SB 4 & TCG/SB 5

ROADSIDE MARGIN AT TCG/SB 4 CONTAINING THREE CORNERED GARLIC & SPANISH BLUEBELL – LOOKING WEST

THREE CORNERED GARLIC & SPANISH BLUEBELL BESIDE THE PATH ALONG THE EASTERN WOODLAND FRINGE AT TCG/SB 5

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

THREE CORNERED GARLIC & SPANISH BLUEBELL – TCG/SB 6

THREE CORNERED GARLIC & SPANISH BLUEBELL IN OPEN GROUND AT TCG/SB 6 LOOKING NORTH WEST

THREE CORNERED GARLIC & SPANISH BLUEBELL BOTH SIDES OF THE PATH ON THE EASTERN WOODLAND FRINGE AT TCG/SB 6

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

RHODODENDRON – RHO 1

RHODODENDRON TREE IN THE EASTERN SECTOR OF THE PROPERTY NORTH OF "THE TERRACE" PUBLIC ROAD

SPREAD OF THE RHODODENDRON TREE IN THE EASTERN SECTOR OF THE PROPERTY NORTH OF "THE TERRACE" PUBLIC ROAD

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

RHODODENDRON – RHO 2

RHODODENDRON TREE IN THE WESTERN SECTOR OF THE PROPERTY NORTH OF "THE TERRACE" PUBLIC ROAD

DETAIL OF THE RHODODENDRON TREE IN FLOWER

SECTION 11 : SITE PHOTOGRAPHS – CONTD.

AMERICAN SKUNK CABBAGE – ASC 1

SMALL AMERICAN SKUNK CABBAGE PLANT IN WET GROUND – LOOKING NORTH

LARGER AMERICAN SKUNK CABBAGE PLANT BEYOND – LOOKING NORTH

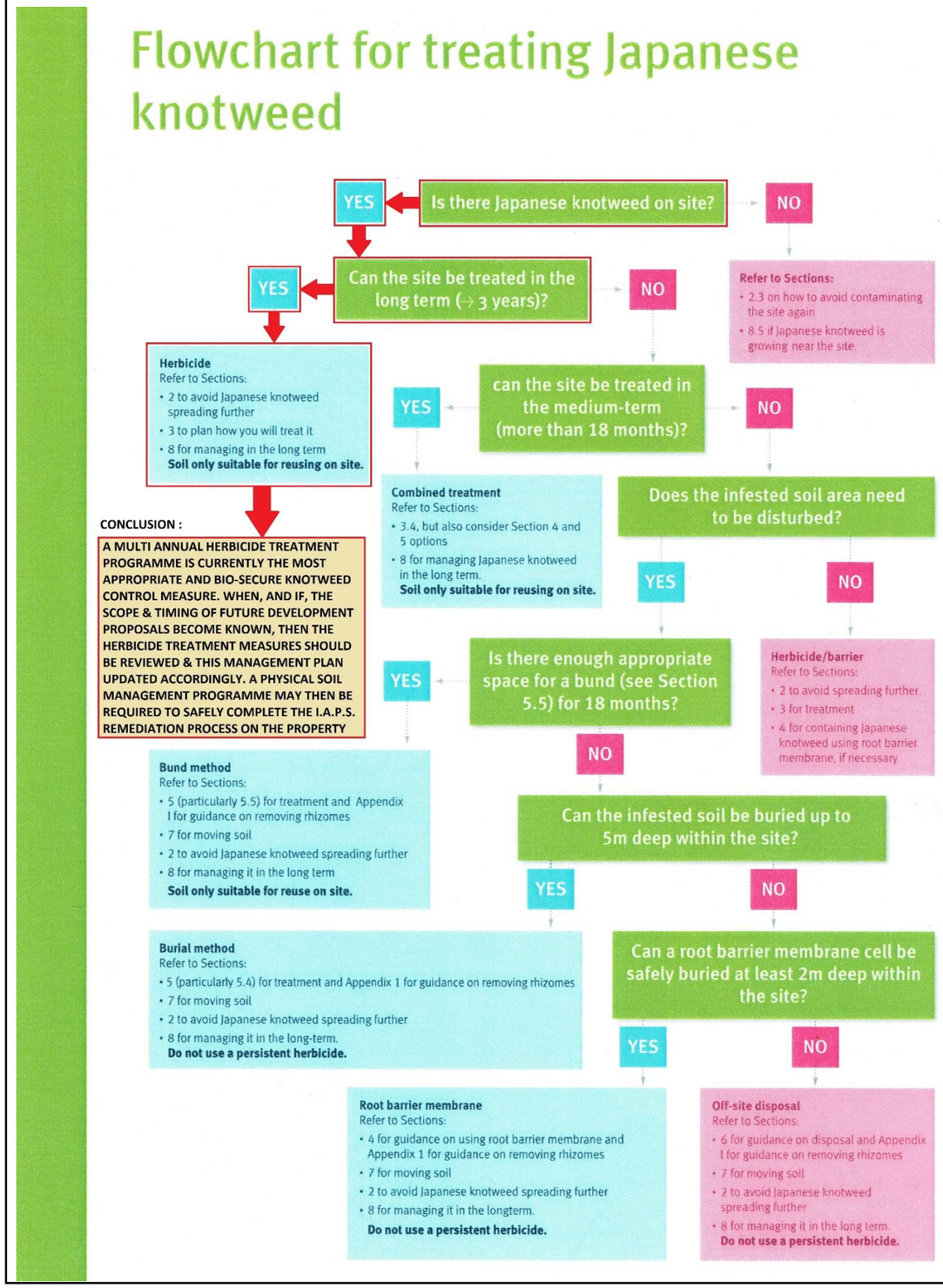
SECTION 12 : CONCLUSIONS & RECOMMENDATIONS

1. BASED ON THE TIME OF YEAR THAT THE 2021 SITE INSPECTION WAS CARRIED OUT, AND CONSIDERING THE GROUND DISTURBANCE WITHIN THE SOUTHERN WOODLAND SECTION OF THE LAND HOLDING, IT IS POSSIBLE THAT I.A.P.S. PLANTS ARE PRESENT BEYOND THE LIMITS RECORDED. IN APPLYING THE “PRECAUTIONARY PRINCIPLE”, ON-GOING SITE MONITORING SHOULD BE MAINTAINED DURING THE 2021 GROWING SEASON
2. FURTHER FORMAL SITE SURVEYS SHOULD BE SCHEDULED ACROSS THE SUMMER GROWING PERIOD, TO INSPECT FOR NEWLY EMERGENT I.A.P.S., INCLUDING KNOTWEEDS, AMERICAN SKUNK CABBAGE AND RHODODENDRON, AS WELL FOR FURTHER NEW SEASON GROWTH OF KNOTWEEDS RELATED TO THE IDENTIFIED STANDS. THE SURVEYS SHOULD INSPECT FOR VIABLE KNOTWEED PLANT/RHIZOME MATERIAL THAT MAY HAVE BEEN DISPERSED INTO OTHER AREAS OF THE PROPERTY. THIS REPORT AND MANAGEMENT PLAN SHOULD BE UPDATED ACCORDINGLY, TO TAKE ACCOUNT OF THE RESULTS OF THE SURVEYS
3. AREAS OF INFESTATION SHOULD BE SECURELY FENCED OFF WITHOUT DELAY, INCLUDING A 5 – 7m BUFFER ZONE AROUND KNOTWEED STANDS. FENCING SHOULD BE STURDY AND SHOULD INCORPORATE APPROPRIATE WARNING / ADVISORY SIGNAGE. WHERE STANDS ARE SMALL, OR JUST INDIVIDUAL STEMS, OR HAVE BEEN PREVIOUSLY TREATED AND COMPRISE OF PRIMARILY OF DEAD STEMS, THEN ADVISORY SIGNAGE ON STURDY TIMBER POSTS MAY SUFFICE
4. THIS REPORT SHOULD BE CIRCULATED TO ALL MEMBERS OF THE DESIGN TEAM FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, AS WELL AS PRESCRIBED AUTHORITIES AND ANY ADJOINING LAND OWNERS AFFECTED BY THE I.A.P.S. PRESENCE, WHERE EITHER RELEVANT OR NECESSARY TO DO SO. IN PARTICULAR THE LOCAL AUTHORITY SHOULD BE FORMALLY NOTIFIED OF THE SIGNIFICANT EXTENT OF THREE CORNERED GARLIC AND SPANISH BLUEBELL POPULATING THE MARGINS OF THE PUBLIC ROADWAYS IN THE VICINITY OF THE SUBJECT LANDS
5. THIS MANAGEMENT PLAN AND TREATMENT METHODOLOGY SHOULD BE SCREENED FOR POTENTIAL INPACTS ON ECOLOGICAL RECEPTORS AND SENSITIVITIES, WHERE THEY EXIST, TO FULLY CONSIDER THE REQUIREMENTS OF S.I. 477 OF 2011 – THE EUROPEAN COMMUNITIES (BIRDS AND NATURAL HABITATS) REGULATIONS 2011 AND S.I. 155 OF 2012 – THE EUROPEAN COMMUNITIES (SUSTAINABLE USE OF PESTICIDES) REGULATIONS 2012
6. IN GENERAL THE I.A.P.S. INFESTATIONS ARE HEALTHY AND SUITABLE FOR THE COMMENCEMENT OF A HERBICIDE CONTROL PROGRAMME DURING THE EARLY SUMMER OF 2021, ALTHOUGH THE THREE CORENERD GARLIC AND SPANISH BLUEBELL PLANTS MAY HAVE ALREADY SET SEED AND BE ENTERING SENESCENCE. A MULTI-ANNUAL TREATMENT PROGRAMME SHOULD BE AGREED AND IMPLEMENTED AT THE EARLIEST APPROPRIATE OPPORTUNITY, TO ARREST THE RISK OF FURTHER SPREAD OF KNOTWEEDS AND OTHER I.A.P.S., AND TO COMMENCE THE PROCESS OF CONTROL AND ERADICATION. SEE SECTIONS 13 TO 19 FOR FURTHER DETAILS
7. NO GROUND MAINTENANCE, OPENING UP OR ANY FURTHER GROUND DISTURBANCE SHOULD TAKE PLACE WITHIN THE FENCED AND SIGNED AREAS, WITHOUT PRIOR CONSULTATION WITH, AND THE DIRECTION OF, AN INVASIVE PLANT SPECIES SPECIALIST, AND THEN ONLY UNDER STRICT SUPERVISION
8. ALL RELEVANT STAFF AND SITE VISITORS SHOULD BE BRIEFED ON THE IDENTIFICATION, RISKS AND DANGERS OF KNOTWEEDS AND OTHER I.A.P.S., AND ON THE SPECIFIC MEASURES, RESTRICTIONS AND PROTOCOLS TO BE DEPLOYED ON THE ESTATE IN GENERAL, AND THE HOTEL DEVELOPMENT SITE IN PARTICULAR
9. IF ACCESS TO THE INFESTED AREAS IS NECESSARY, AND PARTICULARLY IF ANY ESSENTIAL WORK HAS TO BE CARRIED OUT WITHIN THE FENCED LOCATIONS, THEN THIS MUST ONLY BE DONE FOLLOWING FORMAL APPROVAL IN ADVANCE, AND AFTER THE PREPARATION AND AGREEMENT OF A “TASK SPECIFIC” METHOD STATEMENT. NO VIABLE PLANT MATERIAL OR RHIZOME SHOULD BE DISTURBED IN, OR REMOVED FROM, THE ZONES OF INFESTATION
10. WHEN AND IF DEVELOPMENT PROPOSALS ARE APPROVED, AND DETAILED DESIGNS FINALISED, AND WHERE THESE WILL RESULT IN ENCROACHMENT INTO I.A.P.S. INFESTED AREAS, THEN A SITE SPECIFIC SOIL REMEDIATION PROGRAMME SHOULD BE DEVELOPED AND DEPLOYED, TO PROVIDE FOR MANAGEMENT OF I.A.P.S. INFESTED SOILS, AND ENSURE THEIR BIO-SECURE DISPOSAL. THE PLAN SHOULD INCLUDE FOR THE PROVISION OF VERTICAL AND HORIZONTAL ROOT BARRIER MEMBRANES WHERE REQUIRED, AND ALL OTHER MEASURES NECESSARY TO ENSURE STRICT BIO-SECURITY COMPLIANCE ACROSS THE CONSTRUCTION STAGE OF THE PROPOSED DEVELOPMENT. SECTION 19 OF THIS DOCUMENT ALSO PROVIDES SOME GUIDANCE ON MEASURES THAT SHOULD BE DEPLOYED, TO PREVENT THE EXTERNAL INTRODUCTION OF I.A.P.S., DURING CONSTRUCTION WORKS
11. DETAILED GROUND REMEDIATION PROPOSALS SHOULD BE DEVELOPED IN THE POST PLANNING STAGE OF THE DEVELOPMENT PROCESS, IN CLOSE CO-ORDINATION WITH THE RELEVANT DESIGN TEAM CONSULTANTS AND, TO THE GREATEST EXTENT POSSIBLE, SHOULD BE CARRIED OUT AS A SEPERATE ENABLING WORKS CONTRACT IN ADVANCE OF THE COMMENCEMENT OF A PRIMARY CONSTRUCTION CONTRACT

SECTION 13 : KNOTWEEDS - PROCESS OF TREATMENT SELECTION

INVASIVE ALIEN SPECIES							
JAPANESE KNOTWEED		GIANT KNOTWEED		BOHEMIAN KNOTWEED	X	HIMALAYAN KNOTWEED	X
SELECTION OF TREATMENT							

THE MATRIX BELOW HAS BEEN DEVELOPED BY THE U.K. ENVIRONMENT AGENCY, BASED ON BEST PRACTICE AND THE APPLICATION OF "THE PRECAUTIONARY PRINCIPLE". THIS PROCESS IS INTENDED TO ARRIVE AT THE OPTIMUM JAPANESE KNOTWEED MANAGEMENT SOLUTION, WHICH POSES THE LEAST BIO-SECURITY RISK, AND WHICH MANAGES THE PLANT REMEDIATION PROCESS AS CLOSE AS PRECTICABLE TO IT'S EXISTING LOCATION



SECTION 14 : KNOTWEEDS - MANAGEMENT & REMEDIATION PLAN

TREATMENT PLAN				
TREATMENT METHODOLOGY	BASED ON THE OUTCOME OF THE ANALYSIS CARRIED OUT USING THE FLOWCHART AT SECTION 13 ABOVE, IN CONJUNCTION WITH THE CURRENT PREVAILING SITE CONDIITIONS, AND THE INTENTIONS FOR THE FURTHER COMPREHENSIVE RE-DEVELOPMENT OF PARTS OF THE LANDS IN THE SHORT TO MEDIUM TERM, THE PRINCIPLES OF THE PREFERRED MANAGEMENT SOLUTION ARE AS FOLLOWS : 1. FENCE OFF IDENTIFIED BOHEMIAN AND HIMALAYAN KNOTWEED LOCATIONS, USING SECURE FENCING, INCORPORATING APPROPRIATE ADVISORY/WARNING SIGNAGE, AND INCLUDING RECOMMENDED SAFE BUFFER ZONE – SEE APPENDIX 7 AND 8 FOR TYPICAL EXAMPLES 2. CARRY OUT ON-GOING INSPECTIONS OF THE PROPERTY ACROSS THE 2021 SUMMER GROWING PERIOD, TO VALIDATE THE RESULTS OF THE CURRENT SITE SURVEY, AND TO SCREEN THE SITE FOR ADDITIONAL INVASIVE ALIEN PLANT SPECIES WHICH MAY NOT HAVE FULLY EMERGED AT THE TIME OF THE MAY 2021 SITE INSPECTION, OR WHICH MAY HAVE BEEN DISTURBED DURING LAND MANAGEMENT ACTIVITIES, AND MAY HAVE BEEN INADVERTENTLY MOVED IN SOIL SPOIL MATERIAL TO PREVIOUSLY UNINFESTED LOCATIONS 3. UPDATE THIS I.A.P.S. ASSESSMENT REPORT & MANAGEMENT PLAN, AS NECESSARY, FOLLOWING EACH FOLLOW UP SITE SURVEY 4. INSTITUTE A MULTI-ANNUAL HERBICIDE TREATMENT PROGRAMME IN EARLY SUMMER 2021, TO COMMENCE THE MANAGEMENT OF KNOTWEED STANDS BK 1, BK 2, HK 1 AND HK2 5. FOR THE KNOTWEED LOCATIONS, WHEN THE DEVELOPMENT PROGRAMME BECOMES CLEAR, AN UPDATED MANAGEMENT PLAN SHOULD BE PREPARED TO PHASE OUT THE HERBICIDE TREATMENT PROCESS, AND TO REPLACE IT WITH THE PHYSICAL REMEDIATION OF INFESTED SOILS. THE PRECISE DETAILS AND TIMING OF THIS PLAN IS TO BE BASED ON UP TO DATE SURVEY INFORMATION AND DEVELOPED IN PARALLEL TO THE FINALISATION OF DETAILED PROJECT DESIGN. 6. THE CURRENT PREFERRED LONG TERM REMEDIATION SOLUTION WOULD BE FOR THE CONTROLLED REMOVAL OF INFESTED SOILS, FOR OFF-SITE DISPOSAL TO A SUITABLE LICENCED WASTE FACILITY, IN CONJUNCTION WITH THE USE OF VERTICAL ROOT BARRIER MEMBRANES INSTALLED TO PROTECT ANY RETAINED UNDERGROUND WALLS AND STRUCTURES THAT COULD CONTAIN VIABLE KNOTWEED RHIZOME MATERIAL.			
MANAGEMENT ELEMENTS	INITIAL / MULTI-ANNUAL HERBICIDE CONTROL	X	ON-SITE BELOW GROUND SOIL CONTAINMENT CELL	
	DEEP BURIAL – GREATER THAN 5m		EXCAVATE AND DISPOSE OFF-SITE	X
	EXCAVATE AND TREAT IN ON-SITE TEMPORARY BUND		CERTIFIED ROOT BARRIER MEMBRANE SYSTEMS	X
HERBICIDE TREATMENT TECHNIQUE	FOLLIAR SPRAY		STEM INJECTION	X
	CUT AND STEM FILL		SPOT SPRAY / LEAF WIPE / SWAB	X
	STEM INJECTION TO CONSIST OF A 2ml DOSE OF UNDILUTED ROUNDUP BIACTIVE XL, OR ALTERNATIVE LICENCED GLYPHOSATE BASED AND AQUATIC APPROVED HERBICIDE, APPLIED FULLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. INJECTION TO BE APPLIED TO ALL SUITABLE HEALTHY KNOTWEED STEMS, AS CLOSE AS POSSIBLE TO THE BASE OF EACH HOLLOW STEM, USING A PROPRIETARY CALLIBRATED INJECTION UNIT AND NARROW GUAGE NEEDLE, WITH HERBICIDE SUPPLIED VIA A PRE-FILLED DISPENSING UNIT. ON-SITE HANDLING OF HERBICIDE TO BE AVOIDED **SPOT SPRAY** TO CONSIST OF A TARGETED DOSE OF ROUNDUP BIACTIVE XL IN SOLUTION, AT A DILUTION RATE OF 1:40, OR ALTERNATIVE GLYPHOSATE BASED AND AQUATIC APPROVED HERBICIDE, APPLIED FULLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. SPRAY TO BE APPLIED ONLY TO SUITABLE HEALTHY KNOTWEED LEAVES, AND APPLIED USING A PROPRIETRY SPRAY UNIT FITTED WITH AN ANTI DRIFT SHIELD. SPRAY ONLY TO BE APPLIED UNDER SUITABLE PREVAILING WEATHER CONDITIONS AND APPLIED AT A RATE AND PRESSURE WHICH MINIMISES RUN OFF FROM THE KNOTWEED LEAVES. SITE HANDLING AND MIXING OF HERBICIDE TO BE AVOIDED TO THE GREATEST EXTENT POSSIBLE			
ADDITIONAL WORKS	CUT AND BAG PLANT MATERIAL		SHRED & DISPOSE OF VIABLE PLANT MATERIAL	
HERBICIDE TYPE	APPROVED FOR USE WITH KNOTWEEDS	X	APPROVED FOR USE IN AQUATIC ENVIRONMENTS	X
BIO-SECURITY MEASURES	FENCE OFF INFESTATIONS AND FIT WARNING SIGNS	X	SET 5 – 7m SAFETY ZONE AROUND INFESTATIONS	X
	ADVISE AFFECTED PARTIES / NOTIFY NEIGHBOURS		BRIEF WORKERS AND VISITORS TO PROPERTY	X
	IF MORE THAN 1 PARTY, AGREE WORKS IN ADVANCE		ONGOING MONITORING AND RECORDING	X

SECTION 15 : THREE CORNERED GARLIC & SPANISH BLUEBELL – MANAGEMENT PLAN

TREATMENT PLAN				
TREATMENT METHODOLOGY	THE PREFERRED SOLUTION FOR MANAGING THREE CORNERED GARLIC & SPANISH BLUEBELL IS : 1. FIT FENCING AND/OR APPROPRIATE SIGNAGE AT THE IDENTIFIED THREE CORNERED GARLIC AND SPANISH BLUEBELL LOCATIONS – SEE APPENDIX 7 AND 8 FOR TYPICAL EXAMPLES 7. CARRY OUT ON-GOING INSPECTIONS ACROSS THE 2021 SUMMER GROWING PERIOD, TO VALIDATE THE RESULTS OF THE CURRENT SITE SURVEY, AND TO SCREEN THE SITE FOR ADDITIONAL INVASIVE ALIEN PLANT SPECIES WHICH MAY NOT HAVE FULLY PRESENTED AT THE TIME OF THE MAY 2021 SITE INSPECTION, OR WHICH MAY HAVE BEEN DISTURBED DURING LAND MANAGEMENT ACTIVITIES, AND MAY HAVE BEEN INADVERTENTLY MOVED IN SOIL SPOIL MATERIAL TO PREVIOUSLY UNINFESTED LOCATIONS 2. UPDATE THIS I.A.P.S. ASSESSMENT REPORT & MANAGEMENT PLAN, AS NECESSARY, FOLLOWING EACH SITE SURVEY 3. INSTITUTE A MULTI-ANNUAL HERBICIDE TREATMENT PROGRAMME, COMMENCING IN SUMMER 2021, CONSISTING OF TWO TREATMENT VISITS PER YEAR, ALL TO BE CARRIED OUT IN ADVANCE OF THE FLOWERING OF PLANTS 4. FOR PART OR ALL OF ANY OF THE THREE CORNERED GARLIC AND SPANISH BLUEBELL SITES THAT COULD BE DISTURBED BY ELEMENTS OF ANY PROPOSED DEVELOPMENT, WHEN THE DEVELOPMENT PROGRAMME BECOMES CLEAR, AND WHERE ERADICATION HAS NOT BEEN VALIDATED, A DETAILED MANAGEMENT PLAN SHOULD BE PREPARED TO PHASE OUT THE HERBICIDE TREATMENT PROCESS, AND TO REPLACE IT WITH THE PHYSICAL REMEDIATION OF INFESTED SOILS			
MANAGEMENT ELEMENTS	MULTI ANNUAL HERBICIDE CONTROL PROGRAMME	X	ON-SITE BELOW GROUND SOIL CONTAINMENT CELL	
	DEEP BURIAL – GREATER THAN 5m		EXCAVATE AND DISPOSE OFF-SITE	X
	EXCAVATE AND TREAT IN ON-SITE TEMPORARY BUND		CERTIFIED ROOT BARRIER MEMBRANE SYSTEMS	
HERBICIDE TREATMENT TECHNIQUE	FOLLIAR SPRAY		STEM INJECTION	
	CUT AND STEM FILL		SPOT SPRAY / LEAF WIPE / SWAB	X
	SPOT SPRAY TO CONSIST OF A TARGETED DOSE OF ROUNDUP BIACTIVE XL IN SOLUTION, AT A DILUTION RATE OF 1:40, OR EQUIVALENT GLYPHOSATE BASED AND AQUATIC APPROVED HERBICIDE, APPLIED FULLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. HERBICIDE TO BE APPLIED USING A PROPRIETRY UNIT FITTED WITH AN ANTI DRIFT SHIELD, AND THEN ONLY UNDER SUITABLE WEATHER CONDITIONS. THE RATE AND PRESSURE OF THE SPRAY MUST MINIMISE THE RUN-OFF FROM TARGET PLANT LEAVES.			
ADDITIONAL WORKS	CUT AND BAG PLANT MATERIAL		SHRED & DISPOSE OF VIABLE PLANT MATERIAL	
HERBICIDE	APPROVED FOR 3 CORNERED GARLIC/SPANISH BLUEBELL	X	APPROVED FOR USE IN AQUATIC ENVIRONMENTS	X
BIO-SECURITY MEASURES	FENCE OFF INFESTATIONS AND FIT WARNING SIGNS	X	SET SAFETY ZONE AROUND INFESTATIONS	X
	MONITOR AND RECORD	X	BRIEF WORKERS AND VISITORS TO PROPERTY	X

SECTION 16 : RHODODENDRON – MANAGEMENT PLAN

TREATMENT PLAN				
TREATMENT METHODOLOGY	THE PREFERRED SOLUTION FOR MANAGING RHODODENDRON IS : 1. FENCE OFF THE IDENTIFIED RHODODENDRON LOCATIONS USING SECURE FENCING AND APPROPRIATE SIGNAGE 2. CARRY OUT ON-GOING INSPECTIONS ACROSS THE 2021 SUMMER GROWING PERIODS, TO SCREEN THE SITE FOR ADDITIONAL RHODODENDRON SEEDLINGS, AND UPDATE THIS I.A.P.S. ASSESSMENT REPORT & MANAGEMENT PLAN ACCORDINGLY 3. INSTITUTE A MULTI-ANNUAL PHYSICAL & HERBICIDE TREATMENT PROGRAMME, COMMENCING IN SUMMER 2021, CONSISTING OF THE CUTTING AND IN-SITU CHIPPING OF THE ABOVE GROUND RHODODENDRON PLANT MATERIAL, AND THE DIGGING OUT OF THE PLANTS' ROOT SYSTEM TO THE GREATEST EXTENT POSSIBLE. IF THE ROOT, OR PART OF IT, HAS TO REMAIN IN THE GROUND THEN THE RESIDUAL PLANT STUMP SHOULD BE SWAB TREATED WITH APPROVED HERBICIDE. WORKS TO BE CARRIED OUT IN ADVANCE OF THE PLANT FLOWERING PERIOD WHEREVER POSSIBLE 4. CONTINUE THE TREATMENT METHODOLOGY IN THE FOLLOWING YEARS AS REQUIRED, INCLUDING THE PULLING OF ALL NEW SEEDLINGS THAT PRESENT THEMSELVES, UNTIL THE REPOSITORY OF VIABLE SEEDS HAS BEEN EXHAUSTED			
MANAGEMENT ELEMENTS	PHYSICAL & HERBICIDE CONTROL PROGRAMME	X	ON-SITE BELOW GROUND SOIL CONTAINMENT CELL	
	DEEP BURIAL – GREATER THAN 5m		EXCAVATE AND DISPOSE OFF-SITE	
HERBICIDE TECHNIQUE	FOLLIAR SPRAY		STEM INJECTION	
	CUT AND STEM FILL		SPOT SPRAY / LEAF WIPE / SWAB	X
HERBICIDE	APPROVED FOR RHODODENDRON	X	APPROVED FOR USE IN AQUATIC ENVIRONMENTS	X
BIO-SECURITY MEASURES	FENCE OFF INFESTATIONS AND FIT WARNING SIGNS	X	SET SAFETY ZONE AROUND INFESTATIONS	X
	MONITOR AND RECORD	X	BRIEF WORKERS AND VISITORS TO PROPERTY	X

SECTION 17 : AMERICAN SKUNK CABBAGE – MANAGEMENT PLAN

TREATMENT PLAN				
TREATMENT METHODOLOGY	THE PREFERRED SOLUTION FOR MANAGING AMERICAN SKUNK CABBAGE IS : 1. FENCE OFF THE IDENTIFIED AMERICAN SKUNK CABBAGE LOCATIONS USING SECURE FENCING AND APPROPRIATE SIGNAGE 2. CARRY OUT ON-GOING INSPECTIONS ACROSS THE 2021 SUMMER GROWING PERIODS, TO SCREEN THE SITE FOR ADDITIONAL EMERGING AMERICAN SKUNK CABBAGE PLANTS, AND UPDATE THIS I.A.P.S. ASSESSMENT REPORT & MANAGEMENT PLAN ACCORDINGLY 3. INSTITUTE A MULTI-ANNUAL PHYSICAL CONTROL PROGRAMME, COMMENCING IN SUMMER 2021, CONSISTING OF DIGGING OUT OF THE PLANT AND ASSOCIATED ROOT SYSTEM, AND DOUBLE BAGGING ALL EVIDENT PLANT GROWTH. PLANT MATERIAL TO BE LEFT ON SITE IN A SEALED HOLDING UNIT, LOCATED IN A SAFE AND CLEARLY DESIGNATED LOCATION, TO ROT DOWN NATURALLY. REMOVAL TO BE IN ADVANCE OF THE FLOWERING AND SEEDING OF PLANTS 4. CONTINUE THE TREATMENT METHODOLOGY IN THE FOLLOWING YEARS, UNTIL THE SEED REPOSITORY IS EXHAUSTED			
MANAGEMENT ELEMENTS	PHYSICAL CONTROL PROGRAMME	X	ON-SITE BELOW GROUND SOIL CONTAINMENT CELL	
	DEEP BURIAL – GREATER THAN 5m		EXCAVATE AND DISPOSE OFF-SITE	
HERBICIDE TECHNIQUE	FOLLIAR SPRAY		STEM INJECTION	
	CUT AND STEM FILL		SPOT SPRAY / LEAF WIPE / SWAB	
HERBICIDE	APPROVED FOR AMERICAN SKUNK CABBAGE		APPROVED FOR USE IN AQUATIC ENVIRONMENTS	
BIO-SECURITY MEASURES	FENCE OFF INFESTATIONS AND FIT WARNING SIGNS	X	SET SAFETY ZONE AROUND INFESTATIONS	X
	MONITOR AND RECORD	X	BRIEF WORKERS AND VISITORS TO PROPERTY	X

SECTION 18 : TREATMENT PROGRAMME

PROGRAMME	
STAGE 1 SPRING/SUMMER 2021	• DEPLOY BIOSECURITY MEASURES, COMPRISING SECURE FENCING AND ADVISORY / WARNING SIGNAGE • CARRY OUT FOLLOW UP SITE SURVEYS, TO INSPECT FOR NEW, EMERGING AND SPREADING I.A.P.S. • UPDATE ASSESSMENT REPORT AND MANAGEMENT PLAN, BASED ON OUTCOME OF SURVEYS
STAGE 2 SUMMER 2021	• CARRY OUT THE FIRST HERBICIDE TREATMENT AT KNOTWEED STANDS , CONSISTING OF STEM INJECTION AND SPOT SPRAYING, AS REQUIRED • CARRY OUT TWO HERBICIDE TREATMENTS AT THREE CORNERED GARLIC AND SPANISH BLUEBELL STANDS , CONSISTING OF SPOT SPRAYING,AS REQUIRED • CARRY OUT PHYSICAL AND HERBICIDE CONTROL TREATMENTS AT RHODODENDRON STANDS, CONSISTING OF THE CUTTING AND IN-SITU CHIPPING OF THE ABOVE GROUND RHODODENDRON PLANT MATERIAL, AND THE DIGGING OUT OF THE PLANTS ROOT SYSTEM. SWAB THE FRESH CUT STUMP OF ANY RESIDUAL PLANT MATERIAL WITH APPROVED HERBICIDE, APPLIED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS DIRECTIONS. INSPECT FOR, AND PULL, ANY EMERGING RHODODENDRON SEEDLINGS • CARRY OUT PHYSICAL CONTROL TREATMENTS AT THE AMERICAN SKUNK CABBAGE STAND, CONSISTING OF DIGGING OUT AND DOUBLE BAGGING OF PLANT MATERIAL, AND ITS PLACEMENT IN A SECURE BULK CONTAINER, LOCATED IN A SAFE AND CLEARLY DESIGNATED LOCATION, AND LEFT TO ROT DOWN ON SITE • INSPECT FENCING AND SIGNAGE. CARRY OUR ANY NECESSARY REPAIRS / REPLACEMENT / RE-CONFIGURATION • CARRY OUT FOLLOW UP SITE SURVEYS, TO INSPECT FOR NEW, EMERGING AND SPREADING I.A.P.S. • UPDATE ASSESSMENT REPORT AND MANAGEMENT PLAN, BASED ON OUTCOME OF SURVEYS • IF PLANNING PERMISSION IS GRANTED AND DEVELOPMENT OF THE LANDS IS SCHEDULED, IN ADVANCE OF FULL ERADICATION HAVING BEEN ACHIEVED, PREPARE AND IMPLEMENT A CONSTRUCTION STAGE INVASIVE ALIEN PLANT SPECIES REMEDIATION PLAN, TO FULLY REMEDIATE THE INFESTED SOILS AT THE AFFECTED I.A.P.S. LOCATIONS, IN ADVANCE OF THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES
STAGE 3 SUMMER/AUTUMN 2021	• RECORD RESULTS OF SUMMER HERBICIDE TREATMENTS AND PHYSICAL CONTROL MEASURES • CARRY OUT THE SECOND HERBICIDE TREATMENT AT KNOTWEED STANDS , CONSISTING OF STEM INJECTION AND SPOT SPRAYING, AS REQUIRED • INSPECT FENCING AND SIGNAGE. CARRY OUR ANY NECESSARY REPAIRS / REPLACEMENT / RE-CONFIGURATION • CARRY OUT FOLLOW UP SITE SURVEYS, TO INSPECT FOR NEW, EMERGING AND SPREADING I.A.P.S. • UPDATE ASSESSMENT REPORT AND MANAGEMENT PLAN, BASED ON OUTCOME OF SURVEYS
STAGE 4 SPRING 2022 ONWARDS	• CONTINUE IMPLEMENTATION OF THE MULTI-ANNUAL HERBICIDE TREATMENT PROGRAMME AND PHYSICAL CONTROL MEASURES, WITH SUFFICIENT TREATMENT, CONTROL AND INSPECTION VISITS, SCHEDULED TO SUIT THE EVOLVING SITE CONDITIONS AND PARTICULAR I.A.P.S. GROWTH CYCLES, AND AS NECESSARY TO ACHIEVE AND VALIDATE FULL ERADICATION OF ALL I.A.P.S. STANDS

SECTION 19 : I.A.P.S. – ADDITIONAL CONSTRUCTION STAGE I.A.P.S. MANAGEMENT MEASURES

REMEDIATION PLAN	
OVERVIEW	NOTWITHSTANDING THE FACT THAT THE I.A.P.S. PRESENT ON THE PROPERTY MAY BE EITHER ERADICATED OR REMEDIATED BY THE TIME CONSTRUCTION ACTIVITIES ARE SCHEDULED TO COMMENCE, THERE IS ALWAYS A RISK TO PROPERTIES FROM THE INTRODUCTION OF I.A.P.S. FROM THE OUTSIDE. THE PRIMARY PATHS OF INTRODUCTION ARE VIA : 1. PHYSICAL SPREAD OF I.A.P.S. PLANTS FROM ADJACENT / ADJOINING LANDS 2. AIRBORNE DISPERSAL OF SEEDS OR OTHER VIABLE I.A.P.S. MATERIAL 3. IMPORTED SOILS AND OTHER FILL/LANDSCAPING MATERIALS CONTAINING VIABLE SEED OR OTHER I.A.P.S. MATERIAL 4. SOIL ON MACHINERY AND VEHICLES CONTAMINATED WITH VIABLE SEEDS OR OTHER I.A.P.S. MATERIAL 5. TOOLS AND FOOTWEAR CONTAINING VIABLE SEED OR OTHER I.A.P.S. MATERIAL CONSTRUCTION WORKS, BY THEIR NATURE, POSE A HEIGHTENED RISK OF THE INTRODUCTION OF I.A.P.S. ONTO DEVELOPMENT SITES, PARTICULARLY VIA ITEMS 3. – 5. ABOVE. THEREFORE IT IS ADVISED THAT ALL CONTRACTORS, AND SUB-CUNTRACTORS, SHOULD EMPLOY I.A.P.S. MANAGEMENT PROCEDURES AS AN INTEGRAL PART OF THEIR CONSTRUCTION ACTIVITIES, INCLUDING DEVELOPMENT ON THIS PROPERTY FOR INFORMATION PURPOSES, THE SCHEMATIC OF THE DEVELOPMENT PROPOSAL IS INCLUDED BELOW
PRIMARY MANAGEMENT MEASURES	THE CONTRACTOR SHOULD CONSIDER PREPARING A PROJECT SPECIFIC I.A.P.S. STANDARD OPERATING PROCEDURE DOCUMENT, IN ADVANCE OF WORK COMMENCEMENT. THE DOCUMENT SHOULD BE PREPARED BY AN I.A.P.S. SPECIALIST, AND SHOULD COVER THE BIO-SECURITY MEASURES TO BE TAKEN, INCLUDING THE MAINTENANCE OF RECORDS, TO SCREEN FOR THE INTRODUCTION OF I.A.P.S. AND TO ENABLE THEIR TRACING, IF SUCH AN INTRODUCTION OCCURS, INCLUDING : • VALIDATION THAT ALL MACHINERY / VEHICLES ARE FREE OF I.A.P.S., PRIOR TO THEIR FIRST INTRODUCTION TO SITE • CERTIFICATION FROM THE SUPPLIERS THAT ALL IMPORTED SOILS AND OTHER FILL/LANDSCAPING MATERIALS ARE FREE OF I.A.P.S. • A REGULAR SCHEDULE OF SITE INSPECTIONS ACROSS THE I.A.P.S. GROWING SEASONS, FOR THE DURATION OF THE CONSTRUCTION WORKS PROGRAMME

KYRAN COLGAN
Director

16 SEPTEMBER 2021

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APPENDIX 1
Bohemian Knotweed I.D. Sheet

Inland Fisheries Ireland : Bohemian Knotweed I.D. Sheet

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APPENDIX 2
Himalayan Knotweed I.D. Sheet

Inland Fisheries Ireland : Himalayan Knotweed I.D. Sheet

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APPENDIX 3
Three Cornered Garlic I.D. Sheet

NNSS
GB non-native species secretariat

www.nonnativespecies.org

Produced by Alison Jukes, Max Wade, Vicky Ames and Kelly McKee of RPS

Non-Native Garlics

Species Description

Scientific names: *Allium* species
AKA: Gerllyg (Welsh)
Native to: Mediterranean, Caucasus and Iran
Habitat: Roadsides, hedge banks, riverbanks, field margins, rough and waste ground and in woodland

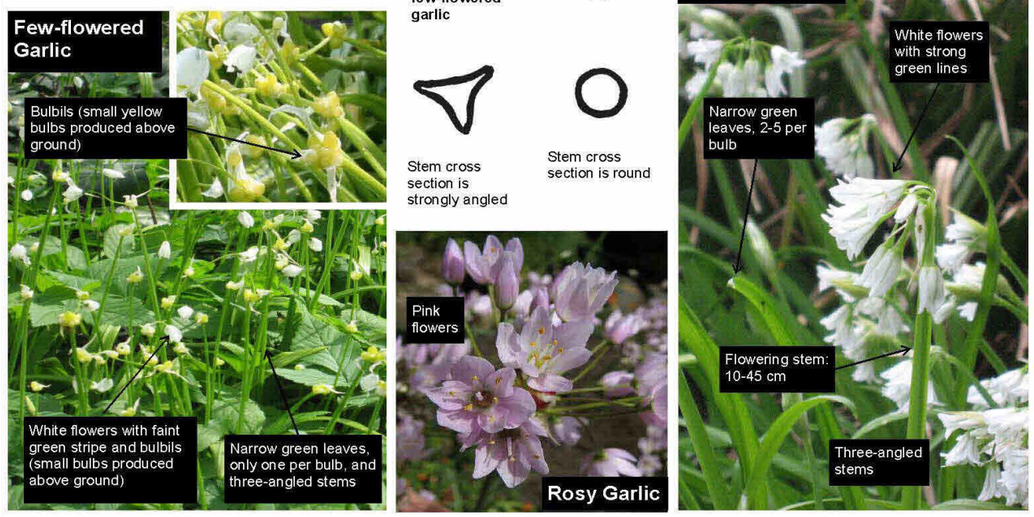
Garlics are perennial herbs with bulbs and grass-like leaves, usually smelling of garlic when fresh and crushed. The most widespread invasive garlics in the UK are Three-cornered Garlic *Allium triquetrum* and Few-flowered Garlic *Allium paradoxum*. Other invasive species include Rosy Garlic *Allium roseum* and Keeled Garlic *Allium carinatum*.

The seeds of Three-cornered Garlic are spread naturally by ants. It was established initially in Guernsey in 1849 and is now naturalised and increasingly abundant and widespread in milder areas of the UK, especially in the south and west, with scattered, sometimes short-lived, populations elsewhere.

Few-flowered Garlic spreads by means of bulbils (small bulbs produced above ground). It was first recorded in the wild near Edinburgh in 1863 and can be very invasive in disturbed habitats. It is increasingly abundant throughout its range, especially in southern Scotland and is most common in the east of Britain.

Rosy Garlic was first recorded in the wild in 1837 and is spreading, especially in south-west England. Keeled Garlic has been naturalised since at least 1806, but there is little evidence of a significant increase in range over the last 50 years.

Key ID Features



Identification throughout the year

Three-cornered garlic flowers April to June.

Few-flowered garlic flowers April to May.

Rosy garlic flowers May to June.

Keeled garlic flowers in August.

Leaves are not present over winter as these species die back in cold winters and come up from bulbs in the spring.

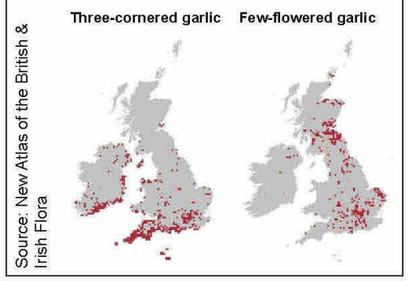
Distribution

Three-cornered garlic is widespread in milder areas, especially the south-west, and has increased in numbers and range.

Few-flowered garlic has a mainly eastern distribution and is increasing throughout its range.

Rosy garlic is scattered in the south and west and is spreading.

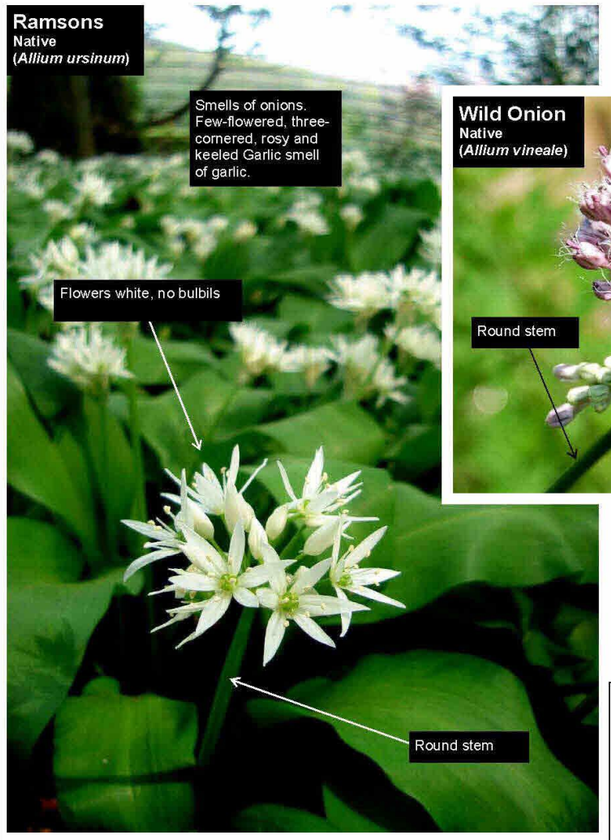
Keeled garlic is scattered throughout the lowlands but does not seem to be increasing.

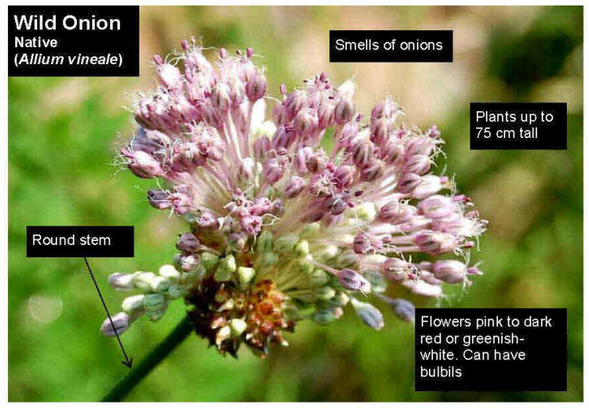


Source: New Atlas of the British & Irish Flora

Similar Species

There are a number of native onion and garlic species in the UK with ramsons and wild onion being the most common. There are many species with leaves which are similar to the non-native garlics but the onion/garlic smell is distinctive.





References and further reading:

Preston *et al.* (2002) "*New Atlas of the British & Irish Flora*". Oxford University Press

Sell, P & Murrell, G (1996) "*Flora of Great Britain and Ireland. Volume 5: Butomaceae-Orchidaceae*". Cambridge University Press

Stace, C (1997) "*New Flora of the British Isles*". Cambridge University Press

Photos from: Becky Dewdney-York, Nhu Nguyen, William Vann, Max Wade

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APPENDIX 4
Spanish Bluebell I.D. Sheet

WIKIPEDIA

Hyacinthoides hispanica

Hyacinthoides hispanica (syn. *Endymion hispanicus* or *Scilla hispanica*), the **Spanish bluebell**, is a spring-flowering bulbous perennial native to the Iberian Peninsula. It is one of around 11 species in the genus *Hyacinthoides*, others including the common bluebell (*Hyacinthoides non-scripta*) in northwestern Europe, and the Italian bluebell (*Hyacinthoides italica*) further east in the Mediterranean region.[1]

It is distinguished from the common bluebell by its paler and larger blue flowers, which are less pendulous and not all drooping to one side like the common bluebell; plus a more erect flower stem (raceme), broader leaves, blue anthers (where the common bluebell has creamy-white ones) and little or no scent compared to the strong fragrant scent of the northern species. Like *Hyacinthoides non-scripta*, both pink- and white-flowered forms occur.

The Spanish bluebell was introduced in the United Kingdom. Since then, it has hybridised frequently with the native common bluebell and the resulting hybrids are regarded as invasive. The resulting hybrid *Hyacinthoides* × *massartiana* and the Spanish bluebell both produce highly fertile seed but it is generally the hybrid that invades areas of the native common bluebell. This has caused the common bluebell to be viewed as a threatened species.

The Spanish bluebell is also cultivated as a garden plant, and several named cultivars exist with flowers in various shades of white, pink and blue.

Hyacinthoides hispanica

Scientific classification	
Kingdom:	Plantae
Clade:	Angiosperms
Clade:	Monocots
Order:	Asparagales
Family:	Asparagaceae
Subfamily:	Scilloideae
Genus:	*Hyacinthoides*
Species:	***H. hispanica***
Binomial name	
Hyacinthoides hispanica (Mill.) Chouard *ex* Rothm.	

References

1. *World Checklist of Selected Plant Families* (http://apps.kew.org/wcsp/home.do), The Board of Trustees of the Royal Botanic Gardens, Kew, retrieved 2011-07-05, search for "Hyacinthoides"

General

- The-Tree.org: Bluebell (https://web.archive.org/web/20060427035443/http://www.the-tree.org.uk/EnchantedForest/WoodlandFlowers/bluebell.htm) (includes key to identification of hybrids)
- Huxley, A. (1992). *New RHS Dictionary of Gardening* vol. 2: 604. Macmillan.

External links

- Media related to *Hyacinthoides hispanica* at Wikimedia Commons

Retrieved from "https://en.wikipedia.org/w/index.php?title=Hyacinthoides_hispanica&oldid=889188975"

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Wikipedia – Spanish Bluebell information page

Native bluebells *(Hyacinthoides non-scripta)*

- Distinctive 'droop' like the top of a shepherd's crook
- Sweet, cool perfume
- Narrow bell-shaped flowers with rolled back tips
- Creamy white pollen

If your bluebells have all of these characteristics then they're native bluebells.

Spanish bluebells (*Hyacinthoides hispanica)* and hybrids

- Upright stems
- No scent
- Conical bell-shaped flowers with open tips
- Blue pollen

If the bluebells you see have some or all of these characteristics then they're not a pure native bluebell.

Berkshire Buckinghamshire & Oxfordshire Wildlife Trusts – Spanish Bluebell identification

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APPENDIX 5
Rhododendron I.D. Sheet

NNSS
GB non-native species secretariat

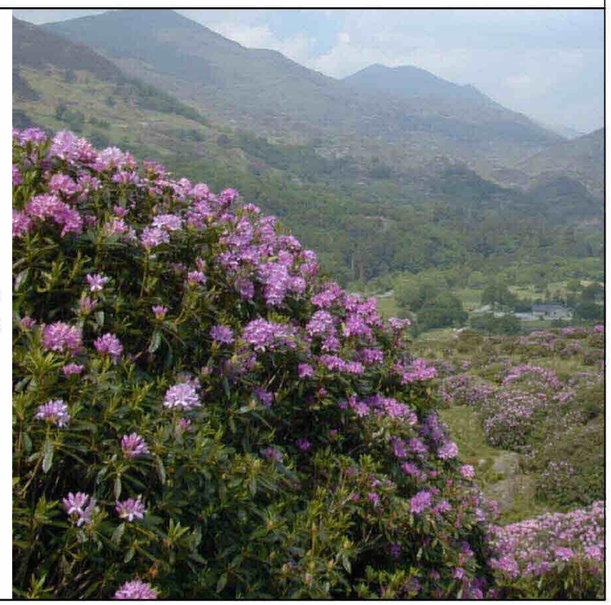
www.nonnativespecies.org

Produced by Olaf Booy, Max Wade and Vicky White of RPS

Rhododendron

Species Description

Scientific name: *Rhododendron ponticum*
AKA: Rhododendron
Native to: South-west Europe and south-west Asia. UK's stock is believed to come from Spain.
Habitat: Common on acid, peaty or sandy soils in woodland, heathland, rocky hill-sides, river banks, gardens and parks



A large evergreen shrub with leathery leaves, attractive purple to pink flowers and solid stems forming into a trunk when mature. Relatively easy to identify, but can be confused with cherry laurel or horticultural varieties of rhododendron. However, horticultural varieties of rhododendron are relatively rarely found in the wild. Spreads by suckers and seed, which are small and carried long distances by wind.

Introduced by gardeners in the late 18th century into parks and woodlands, where it was also used for game cover. Still widely planted, particularly by gardeners. Often grows in ecologically sensitive habitats, such as heath, broad-leaved woodland and dunes, where dense growth can considerably alter the structure of the habitat.

For details of legislation go to www.nonnativespecies.org/legislation.

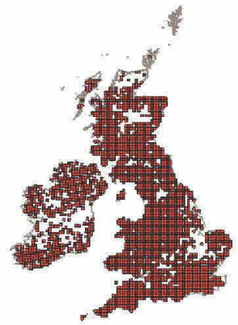
Key ID Features

Identification throughout the year

Varies little throughout the year as leaves are evergreen and woody stems remain the same. Flowers appear May to June followed by seed pods.

Distribution

Widespread across the whole of the UK, most common in the south and west.

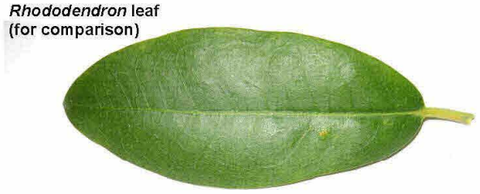


Source: NBN Gateway. Check website for current distribution

Similar Species

Cherry laurel
Non-native
(*Prunus laurocerasus*)

***Rhododendron* leaf**
(for comparison)



Cherry laurel leaf

Varieties of Rhododendron

There are a large number of highly sought after species and varieties of rhododendron, of which the invasive *Rhododendron ponticum* is just one. It is unusual to encounter other varieties or species outside of planted habitats.

References in the further reading list can be used to distinguish between the different varieties if necessary.

Examples of rhododendron varieties:

References and further reading:

Cullen, J (2005) *"Hardy rhododendron species: a guide to identification"*. Collins

Preston, C D and Croft, J M (1997) *"Aquatic plants in Britain and Ireland"*. Harley Books

Preston, C D, Pearman, D A and Dines, T A (editors) (2002) *"New Atlas of the British and Irish Flora"*. Oxford University Press

Stace, C (1999) *"Field Flora of the British Isles"*. Cambridge University Press

Photos from: Olaf Booy, David Fenwick, Mike McCabe, Helen Parish

RESIDENTIAL DEVELOPMENT LANDS
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APPENDIX 6
American Skunk Cabbage I.D. Sheet

NNSS
GB non-native species secretariat

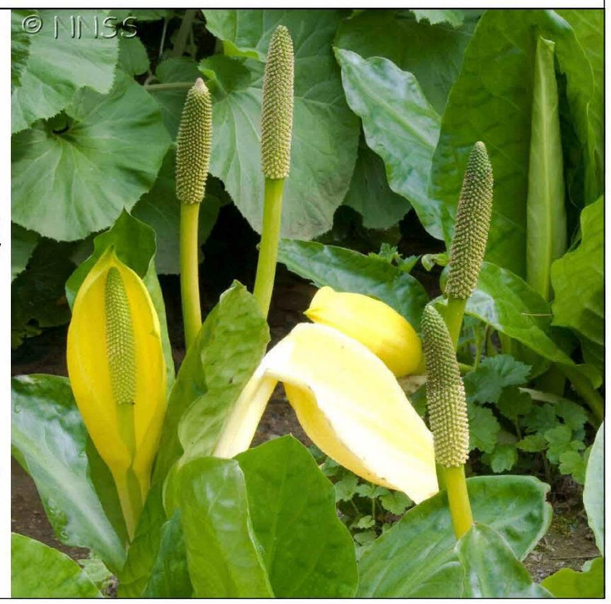
www.nonnativespecies.org

Produced by Peter Brown, Olaf Booy and Mark Hill

American Skunk-cabbage

Species Description

Scientific name: *Lysichiton americanus*
AKA: Western Skunk-cabbage
Native to: Western North America
Habitat: Wet woodland, streamsides, muddy pond margins



Yellow flowers are produced in spring (late March to May) that resemble those of wild arum (lords-and-ladies). They emit a strong odour like that of a skunk. The plant has a basal rosette of stemmed leathery leaves, usually up to about 70cm long. It is a tall herb growing up to 1.5m in height. Green berries are produced in the summer.

American skunk-cabbage needs a wet site but has no specific soil requirements - it can occur in soils from light sand to heavy clay that are acid, neutral or alkaline. It is a hardy perennial lowland plant, but can grow at altitudes of up to 1400m.

Seeds may be dispersed via waterways but also probably by birds and mammals, as occurs in the native range.

American skunk-cabbage is able to form dense stands and may negatively impact on some native plants, out-competing them by shadowing.

Key ID Features

1 or 2 (sometimes up to 4) bright yellow spathes (look like large petals)

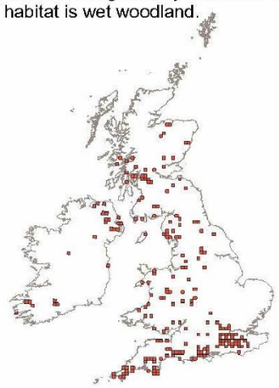
Leaves 40-70cm long (sometimes up to 1.5m)

Identification throughout the year

Most easily identified when in flower (late March to May). When not in flower large cabbage-like leaves, often on swamp mud, may be used for identification.

Distribution

Widespread but not generally common. Its normal habitat is wet woodland.



Source: NBN Gateway. Check website for current distribution

Similar Species

Asian Skunk-cabbage
Non-native
(*Lysichiton camtschatcensis*)

White spathe

Very similar plant but slightly smaller. Occurs in similar habitats. Hybrids between American and Asian skunk-cabbages can occur.

Flowers more or less scentless

Lords-and-ladies
Native
(*Arum maculatum*)

References and further reading:

Blamey, M, Fitter, R and Fitter, A (2003) *"The Wild Flowers of Britain and Ireland. The Complete Guide to the British and Irish Flora"* A & C Black, London

Preston, C D, Pearman, D A and Dines, T A (editors) (2002) *"New Atlas of the British and Irish Flora"*. Oxford University Press

Stace, C (1999) *"Field Flora of the British Isles"*. Cambridge University Press

Photos from: Sannse, RPS and GBNNSS

U.K. Non Native Species Secretariat : American Skunk Cabbage I.D. Sheet - Page 2

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APPENDIX 7
Sample Site Signage

SAMPLE SIGN 1

SAMPLE SIGN 2

SAMPLE SIGN 3

SAMPLE SIGN 4

SAMPLE SIGN 5

RESIDENTIAL DEVELOPMENT LANDS
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APPENDIX 8
Sample Site Fencing

SAMPLE FENCING 1 – POST AND WOVEN MESH FENCING

SAMPLE FENCING 2 – HEAVY DUTY HERRAS FENCING

LACKENROE **SHD**

APPENDIX 9-4

Hedgerow Field Data Recording Forms - Kelleher Ecology Services

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Appendix 9-4 Hedgerow Field Data Recording Forms

Structural Recording Form:

Hedge Reference	2	4
Date of Recording	09.04.21	09.04.21
Length of Hedge (m)	165	170
Surveyors	MON	MON
GPS Start Point		
GPS End Point		
Start Point to start of 1st 30m strip	80	45
End of 1st 30m to start of 2nd 30m strip	5	28
End of 2nd 30m to End Point	13	37
Corine		
Soil Type		
a1. Altitude min. (m)		
a2. Altitude max.(m)		
b1. Aspect Side 1	N	W
b2. Aspect Side 2	S	E
A1. Adjct Land Use Side 1	H	H
A2. Adjct Land Use Side 2	H	H
B. History	1	N/A
B1. History Road / Stream	N/A	N/A
B1a. Road Class	N/A	N/A
B2 History Ordnance Survey	1	N/A
B3 Sites and Monuments Record	N/A	N/A
B4 Old Woodland Link	N/A	N/A
C1. Adjacent Land Class Side 1	ED3	ED3
C2. Adjacent Land Class Side 2	ED3	**ED3**
D1. Habitat Link Class End 1	M	**M**
D2. Habitat Link Class End 2	M	**M**
D3. Designated Site	No	**No**
E. Boundary Function	1	1
F. Outline	A	A
G1. Linearity of Shrubs	3	3
G2. Bank, Wall, Shelf	1	1
G3. Drain	0	0
G4. Fossit Class	WL1	WL1
H. Bank,Wall,Shelf size	C	C
I. Drain Size	N/A	N/A
J. Profile	b	b
J1. Profile base suffix	a	b
K. Height	3	3
K1. Height o/head cables	N/A	N/A
L. Width	C	C
M. % of Gaps	4	4
M1. Specific or general	A	A
N. Base Structure	B	B
N1. Base - Vegetation	A	A
O. Bank Degradation Degree	4	4
O1. Bank Degradation Extent	B	B
P. Trees Quantity	D	D
Q. Tree Age Composition	4	4
Q1. Tree Height (max)	10	10

Hedge Reference	2	4
Q2. Tree Height (min)	4	4
R. Verge / Margin Width Side 1	C	B
R2. Verge / Margin Side 1 Degradation	0	1
R3. Verge / Margin Width Side 2	0	1
R4. Verge / Margin Side 2 Degradation	0	1
S. Vigour	B	B
U. Management	J/F	J
U1. Management - out of season	N/A	N/A
U2. Management Stage	N/A	N/A
V. Management Method	N/A	N/A
W. Evidence of Rejuvenation - Past	A	A
W1. Evidence of Laying - Recent	N/A	N/A
X. Fencing Side 1	1	1
X1. Fencing Side 2	1	1
X3. Fencing wire to stems	N/A	N/A
Y. Ground Flora	E	E

Shrub Recording Form:

Hedge Reference	2a	2b	4a	4b
Gaps	10	20	10	40
SHRUB Layer (Domin Scale)				
Corylus_avelana HAZEL				
Crataegus_monogyna HAWTHORN		1	7	5
Fraxinus_excelsior ASH	1	1		
Ilex_aquifolium HOLLY				
Prunus_spinosa BLACKTHORN				
Sambucus_nigra ELDER	1	1	1	5
Sorbus_aucuparia ROWAN				
Ulex_europaeus GORSE			1	5
Salix_spp. WILLOW Present_Absent				
Salix_spp. WILLOW Total				
Salix_aurita EARED WILLOW				
Salix_caprea GOAT WILLOW				
Salix_cinerea GREY WILLOW				
Salix_cinerea_ssp._oleifolia RUSTY WILLOW				
Non-ntv_Salix_spp. Present_Absent				
Salix_spp. NON NATIVE Total				
Salix_alba* WHITE WILLOW				
Salix_fragilis* CRACK WILLOW				
Salix_viminalis* OSIER WILLOW				
Acer_pseduplatanus SYCAMORE	3	3		
Fagus_Sylvatica_BEECH				
Lonicera_nitida* DWARF BOX				
Prunus_domestica WILD PLUM				
Symphoricarpos_albus SNOWBERRY				
Alnus_glutinosa ALDER				
Betula_spp. BIRCH Present_Absent				
Betula_spp. BIRCH Total				
Betula_pendula				
Betula_pubescens				
Euonymus_europaeus_SPINDLE				
Ligustrum_vulgare WILD PRIVET				
Malus_sylvestris CRAB APPLE				
Prunus_avium WILD CHERRY				
Qurcus_spp. OAK SPECIES Present_Absent				
Qurcus_spp. OAK SPECIES Total				
Quercus_petrea SESSILE OAK				
Quercus_robur_ENGLISH OAK				
Ulmus_spp. ELM Present_Absent				
Ulmus_spp. ELM Total				
Ulmus_glabra WYCH ELM				
Ulmus_minor FIELD ELM				
Ulmus_procera ENGLISH ELM				
Ulmus_x_hollandica DUTCH ELM				
Viburnum_opulus GUELDER ROSE				
Cytisus_scoparius BROOM				
Myrica_gale BOG MYRTLE				
Pinus_sylvestris SCOTS PINE				

Hedge Reference	2a	2b	4a	4b
Populus_nigra BLACK POPLAR				
Populus_tremula ASPEN				
Prunus_Padus BIRD CHERRY				
Rhamnus_cathartica BUCKTHORN				
Ribes_nigrum BLACKCURRANT				
Ribes_uva-crispa GOOSEBERRY				
Rubus_idaeus RASPBERRY				
Sorbus_aria WHITEBEAM				
Taxus_baccata YEW				
Other 1 American Currant				1
Other 2				
Other 3				

Climber Trees Recording Form:

Hedge Reference	2a	2b	4a	4b
CLIMBERS, (DAFOR Scale)				
Hedera_helix IVY	A	A	A	A
Rubus_fruticosa_spp BLACKBERRY	D	D	D	D
Rosa_spp ROSE Present_Absent		P		
Rosa_spp ROSE Total		1		
Rosa_canina_agg. DOG ROSE		1		
Rosa_arvensis FIELD ROSE				
Rosa_Pimpinellifolia BURNET ROSE				
Lonicera_periclymenum HONEYSUCKLE	R	R		
Vaccinium myrtillus BILBERRY				
Calluna_vulgaris HEATHER				
Calystegia_sepium BINDWEED				
Clematis_vitalba CLEMATIS				
Solanum_Dulcamara BITTERSWEET				
TREES (Present / Dominant)	P	P	D	P
Crataegus_monogyna HAWTHORN	P	P	P	P
Fraxinus_excelsior ASH	P	D	P	P
Ilex_aquifolium HOLLY				
Malus_sylvestris CRAB APPLE				
Sorbus_aucuparia ROWAN				
Prunus_avium WILD CHERRY				
Alnus_glutinosa ALDER				
Acer_pseduplatanus SYCAMORE	D	P		
Aesculus_hippocastanum HORSE CHESTNUT				
Fagus_sylvatica BEECH				
Picea_spp. SPRUCE				
Tilia_spp. LIME	P			
Salix_spp. NON NATIVE Total				
Non-ntv_Salix_spp.				
Salix_alba				
Salix_spp. WILLOW Present_Absent	P	P		
Salix_spp. WILLOW Total				
Salix_caprea GOAT WILLOW				
Salix_cinerea GREY WILLOW				
Salix_cinerea_ssp._oleifolia RUSTY WILLOW	P	P		
Ulmus_spp. ELM Present_Absent	P			
Ulmus_spp. ELM	P			
Ulmus_glabra WYCH ELM				
Ulmus_minor* FIELD ELM				
Ulmus_procera ENGLISH ELM				
Quercus_spp. OAK Present_Absent	P			
Quercus_spp. OAK	P			
Quercus_petraea SESSILE OAK				
Quercus_robur ENGLISH OAK				
Betula_spp. BIRCH Present_Absent				
Betula_spp. BIRCH				
Betula_pendula				
Betula_pubescens				
Corylus_avelana HAZEL				
Euonymus_europaeus_ SPINDLE				

Hedge Reference	2a	2b	4a	4b
Malus_sylvestris CRAB APPLE				

LACKENROE **SHD**

APPENDIX 9-5

Natura Impact Statement - Kelleher Ecology Services

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NATURA IMPACT STATEMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT AT LACKENROE, GLOUNTHAUNE, CO. CORK.

In support of the Appropriate Assessment Process

Prepared for:

HW Planning

On behalf of Bluescape Ltd

Prepared by:

Kelleher Ecology Services Ltd.

Croft Ecology

December 2021

Croft Ecology

daphne.roycroft@gmail.com

KELLEHER ECOLOGY SERVICES

info@kelleherecologyservices.ie

NATURA IMPACT STATEMENT FOR A PROPOSED RESIDENTIAL DEVELOPMENT AT LACKENROE, GLOUNTHAUNE, CO. CORK.

Our Project Reference: 028-01-2019

Document Rev. No.	Details	Contributor	Date
A	Initial draft	Daphne Roycroft Katherine M. Kelleher	07.09.21
B	Edits	Daphne Roycroft Katherine M. Kelleher	23.09.21
C	Edits	Katherine M. Kelleher	18.10.21
0	Final Report	Daphne Roycroft Katherine M. Kelleher	02.12.21
1	Minor edit	Katherine M. Kelleher	02.12.21

Contents

Figures

Appendices

Executive Summary

This report presents the results of a Natura Impact Statement (NIS), which is Stage 2 of the appropriate assessment process, in relation to a proposed Strategic Housing Development at Lackenroe, Glounthaune, Co. Cork.

It is objectively concluded that with the application of mitigation measures where relevant, no significant adverse effects arising from the proposed development are likely to occur in relation to the Natura 2000 sites; Cork Harbour SPA and Great Island Channel SAC.

1 Introduction

Kelleher Ecology Services Ltd. and Croft Ecology were commissioned by HW Planning, on behalf of Bluescape Ltd., to undertake a Natura Impact Statement (NIS) in support of the Appropriate Assessment process in relation to a proposed Strategic Housing Development (SHD) at Lackenroe, Glounthaune, Co. Cork. This assessment was undertaken as part of a SHD planning application for a proposed residential development.

1.1 Statement of Competence

1.1.1 Dr Daphne Roycroft

Daphne has over 10 years of experience in the field of Ecological Consultancy and holds a BSc and PhD in Ecology from the National University of Ireland, Cork. She is a self-employed Ecological consultant, trading as Croft Ecology. Daphne is experienced in the preparation of Ecological Impact Assessment Reports and Appropriate Assessment screening appraisals as well as Natura Impact Statements for a variety of projects including wind farms, solar farms, roads, pipelines, residential developments, ports and landfill sites. She has published research papers in several peer-reviewed scientific journals and has lectured on several degree and certificate courses in The National University of Ireland, Cork.

1.1.2 Dr Katherine Kelleher

Katherine Kelleher is a graduate of University College Cork with a BSc in Zoology and PhD in Ecology, and established Kelleher Ecology Services in 2011. She has over 15 years of experience in ecological consultancy, acting as project manager on a range of ecological assessments & projects including solar/wind farm, road, gas pipeline, landfill, grid connection, industrial development, retail and housing. Katherine has significant experience of research, evaluative and analytical work in relation to planning applications, EIAR, appropriate assessment, planning compliance, commitments, licensing, baseline assessments, scoping studies *etc*.

1.2 Background: Appropriate Assessment

An Appropriate Assessment is undertaken to establish if any proposed plan or project is likely to have a significant effect or impact on any site that has been designated under: the E.U. Habitats Directive (92/43/EEC) *i.e.* SAC; or the E.U. Birds Directive (79/409/EEC as amended 2009/147/EC) *i.e.* SPA. Collectively, SAC's and SPA's are known as Natura 2000 sites. The E.U. Habitats Directive has been transposed into Irish law under Part X AB of the Planning and Development Act 2000-2021 and the European Communities (Birds and Natural Habitats) Regulations 2011-2015. Appropriate Assessment has been a legal requirement in Ireland since the 26th of February 1997 when the European Communities (Natural Habitats) Regulations 1997 (S.I. No. 94/1997) were signed into law by the then Minister for Arts, Culture and the Gaeltacht, Michael D. Higgins.

A NIS is part of an appropriate assessment process that consists of up to four stages, where each stage follows on from the preceding one. The need to undertake one or more stages of this process has arisen from Articles 6(3) and 6(4) of the aforementioned Habitats Directive; where the former Article is primarily concerned with the protection of sites from likely significant effects and the latter allows derogation from such protection in very specific circumstances involving imperative reasons of overriding public interest.

In Stage 1, a screening process is undertaken to identify whether significant[1] impacts on a Natura 2000 site are likely to arise from the project or plan in question. If significant impacts are likely to occur or if it is unclear whether significant impacts are likely to occur, then the process moves on to Stage 2 where an AA considers potential mitigation measures for adverse impacts. If it is considered that mitigation measures will not be able to satisfactorily reduce potential adverse impact on a Natura 2000 site then an assessment of alternative solutions is considered in Stage 3. This is then followed by Stage 4 in the event that adverse impacts remain and the proposed activity or development is deemed to be of Imperative Reasons of Overriding Public Interest (IROPI), allowing an assessment of compensatory measures to be considered. The outcome of a Stage 2 and higher assessment is presented in a report known as a Natura Impact Statement (NIS).

Given the presence of hydrological links between the study site and two Natura 2000 sites (Cork Harbour SPA and Great Island Channel SAC), a Stage 2 NIS in support of the Appropriate Assessment process is deemed appropriate here.

While an AA NIS is provided by the advocate of the plan or project in question, the AA NIS itself is undertaken by the competent authority (*i.e.* the planning authority, An Bord Pleanála). In this case, An Bord Pleanála is the competent authority in relation to AA regarding the project described herein; although informed by this NIS and any other necessary information.

1.3 Methodology

The conservation objectives of Natura 2000 sites have been compiled by the National Parks & Wildlife Service (NPWS) in relation to the habitats and species (*i.e.* qualifying interests) for which the sites are selected. These conservation objectives are referred to when carrying out appropriate assessments for plans and projects that might impact on these sites.

Documents associated with the proposed project and relevant ecology databases were consulted as part of this assessment (as referenced in this report), with field assessments also undertaken at various dates in 2019 and 2021 to inform an ecological impact assessment as part of an Environmental Impact Assessment Report (EIAR; see Bluescape Ltd. 2021) as well as this NIS. Cognisance was also taken of guidelines (OPR 2021, European Commission 2018, EPA 2013, DoEHLG 2009, European Commission 2021), as well as case law.

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[1]A European Court of Justice ruling in 2013 (Case C-258/11) has stated the following regarding significant effect: "Where a plan or project not directly connected with or necessary to the management of a site is likely to undermine the site's conservation objectives, it must be considered likely to have a significant effect on that site. The assessment of that risk must be made in the light of, in particular, the characteristics and specific environmental conditions of the site concerned by such a plan or project (see, to this effect, Waddenvereniging and Vogelbeschermingsvereniging, paragraph 49)"

2 Brief Description of the Site & Project

2.1 Study Site: Location

The *c*. 12.7ha study site is located just east of Glounthaune Village and north of Lough Mahon/Harper's Island transitional waterbody - on lands to the north and south of the L-2970 public road, known locally as 'the Terrace' (Figure 2.1). The study site is greenfield in nature, largely comprising of former agricultural fields (unmanaged/fallow comprising mostly recolonising bare ground) to the north and woodland to the south where the site slopes from *c*. 110m north to *c*. 5m south above sea level.

The study site is located within the Lee, Cork Harbour and Youghal Bay Catchment (Tibbotstown sub-catchment), Hydrometric Area 19 and in the Southwestern River Basin District[2]. There are no watercourses or other over-ground water-features (such as drains) at the study site. Lough Mahon (Harper's Island) transitional waterbody is located *c*. 40m to the south of the study site where two overlapping Natura 2000 designations are also present; Cork Harbour SPA and Great Island Channel SAC (Figure 2.1). Lough Mahon (Harper's Island) transitional waterbody is of moderate status and at risk of deteriorating or being at less than good status in the future under the Water Framework Directive[2].

Further information on the study site and proposed development are provided below in Sections 2.2 and 2.3 respectively.

2.2 Study Site: Walkovers

Walkovers were undertaken at the study site at various dates in 2019 and 2021 as part of EIAR field assessments (see Bluescape Ltd. 2021). The walkovers gained an overview of the study site as well as noting ecological points of interest such as the presence of invasive plant species and species that are part of the qualifying interests of the Natura 2000 sites relevant here.

The study site comprises of former agricultural fields to the north that appear to have been abandoned or left fallow such that recolonising bare ground with a mixed assemblage of largely ruderal plant species now dominates, mixed broadleaved woodland associated with an unmanaged former garden and unoccupied house at the middle area of the study site, and modified mixed broadleaved woodland comprised predominately of self-seeding Sycamore to the south (see Plate 1). Other habitat features present include hedgerow, treelines, stone walls and scrub.

No qualifying interest species/habitats of the relevant Natura 2000 sites under consideration here were confirmed at the study site during the field surveys, where the study site does not currently support habitats of ex-situ ecological value for relevant qualifying interests of the Natura 2000 sites in question.

[2] See http://gis.epa.ie/Envision

Plate 1. Overview of recolonising bare ground habitat at the former farmland part of the study site (top) and mixed broadleaved woodland associated with a former garden (bottom left) and self-seeding dominant Sycamore (bottom right).

A number of non-native invasive plant species listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations (*i.e.* species of which it is an offense to disperse, spread or otherwise cause to grow in any place) are present at the study site as follows; Bohemian Knotweed *Fallopia Bohemica*, Himalayan Knotweed *Persicaria wallichii*, Three-cornered Garlic *Allium triquetrum*, Spanish Bluebell *Hyacinthoides hispanica*, Rhododendron *Rhododendron ponticum* and American Skunk Cabbage *Lysichiton americanus* (see IPS 2021). A dedicated Invasive Plants Survey and Management Plan has been developed in relation to these Third Schedule species (IPS 2021). Other non-native plant species are also present at the study site (that are not listed on the Third Schedule) that will also be managed in accordance with best practice (*e.g.* NRA 2010); Buddleia *Buddleia davidii*, Winter Heliotrope *Petasites fragrans*, Snowberry *Symphoricarpos albus*, Cotoneaster *Cotoneaster sp.*, Fuchsia *Fuchsia magellanica*, Lawson Cypress *Chamaecyparis lawsoniana* and Cypress Leyland *Cupressus x leylandii* species.

2.3 Project Details

2.3.1 Proposed Development

The proposed development will involve the construction of a mixed-use residential development of 289 no. residential units consisting of 201 no. dwelling houses and 88 no. apartment/duplex units, a two storey creche, 4 no. ESB substations and all ancillary site development works at Lackenroe and Johnstown townlands (see Appendix A). The proposed development will be constructed on lands to the north and south of the public road, L-2970, known locally as 'the Terrace'. A portion of the site to the south of 'the Terrace' was formerly within Ashbourne Garden and is considered to be within the curtilage and attendant grounds of Ashbourne House, which is a Protected Structure (Ref 00498). Vehicular access to 2 no. dwellings in the lands to the north of 'the Terrace' will be provided via an upgraded entrance from 'the Terrace' with vehicular access to the remainder of dwellings in the lands to the north of 'the Terrace' via the signalised junction from the L-2968 and internal road network permitted by Cork County Council reference 17/5699 and An Bord Pleanála reference 300128-17. A separate secondary emergency access is also proposed from the L-2969 to the north. Vehicular access to the 5 no. dwellings to the south of the 'the Terrace' will be via a new entrance from 'the Terrace' and the proposed apartment building will be accessed from Johnstown Close. The proposed development also makes provision for a pedestrian link from the proposed development north of 'the Terrace' to Johnstown Close via 'the Terrace' which will include a signalised pedestrian crossing and associated traffic calming measures on 'the Terrace'. Ancillary site works include the demolition of 1 no. existing derelict dwelling house and associated outbuildings, landscaping and servicing proposals including the realignment of the existing pedestrian/cycle route on Johnstown Close, the undergrounding of existing overhead lines, upgrade of the storm and foul sewer network to the south and east of the study site along 'the Terrace' and Johnstown Close (L-3004) existing public roads.

The proposed lighting scheme will focus lighting on areas where it is needed (roads, streets, footpaths) and minimise spillage onto relevant sensitive areas comprising of retained/new woody features (hedgerow, woodland/woodland edge, tree lines/groups) at the study site or the adjoining area in general including the nearby estuary (see AECOM 2021e and Glounthaune Development Public Lighting drawing by Lighting Reality accompanying the planning application). The proposed development will be constructed on a phased basis, starting at the northern area of the study site. It is anticipated that the duration of the construction phase of the proposed development will be 48 months.

A site specific flood risk assessment has been completed for the proposed development that concludes that the study site does not have a known history of flooding, is within a low probability flooding area (*i.e.* flood zone C, less than 0.1% or 1 in 1,000 year event for river and coastal flooding) and has a low risk in relation to pluvial and groundwater flooding (see AECOM 2021a). The flood risk assessment also highlights that the proposed development will not increase flood risk elsewhere (see AECOM 2021a).

2.3.2 Environmental Inputs

The proposed site development works will be carried out in accordance with best practice regarding standard environmental protection (*e.g.* CIRIA 2015 and 2001). Environmental inputs associated with the proposed development will include surface-water run-off, waste-water and other wastes; however, these inputs will be controlled/managed as follows.

2.3.2.1 Surface-Water Run-Off: Construction Phase

There are no watercourses or other overground water-features at the study site that could convey silt-laden or contaminated run-off into the surrounding area, where surface-water currently percolates to ground. A proposed new surface-water drainage network will be installed at the study site, part of which may become active as construction works progress. The proposed surface-water drainage network will connect into the existing public storm-sewer network that ultimately discharges into Lough Mahon (Harper's Island) transitional waterbody, where Cork Harbour SPA and Great Island Channel SAC are also present, via an existing outfall to the south-west of the study site (see Figure 2.1).

While surface-water run-off will generally percolate to ground during the construction phase, standard environmental controls will nonetheless be implemented as part of the project to ensure the appropriate management and control of construction stage surface-water run-off potentially arising from development activities at the site (*e.g.* CIRIA 2015 and 2001). Such construction related controls will be specific to the site, proposed works and Lough Mahon (Harper's Island) transitional waterbody with associated Cork Harbour SPA and Great Island Channel SAC as follows (see AECOM 2021b):

<u>Spill Control Measures</u>

It is not proposed to store any oils/fuels for the purpose of refuelling on the site.

Onsite plant will be refuelled by an external contractor who will call to site as required. Road vehicles are not be refuelled at the site. Minor spills and leaks may occur from road vehicles and the onsite excavator. Any oils or fuels onsite will be removed by an experienced and authorised contractor.

- The following steps provide the procedure to be followed in the event of any significant spill or leak.
- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- Eliminate any sources of ignition in the immediate vicinity of the incident
- Contain the spill using the spill control materials, track mats or other suitable material. Do not spread or flush away the spill.
- Cover or bund off any vulnerable areas where appropriate such as drains or watercourses.
- Clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the Contractor immediately giving information on the location, type, and extent of the spill so that they can take appropriate action and further investigate the incident to ensure it has been contained adequately.
- The Employers Representative will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.

<u>Run-off Control Measures</u>

- Dewatering measures will only be employed where there are no other alternatives.
- For groundwater encountered during construction phase, mitigation measures will include;
    - Dewatering by pumping to a soakaway.

- Excluding contaminating materials such as fuels and hydrocarbons from sensitive parts of the site i.e. highly vulnerable groundwater areas.

- If concrete mixing is carried out on site, the mixing plant will be sited in a designated area with an impervious surface.
- Existing surface drainage channels within the site that serve adjacent lands will be retained where possible to prevent causing increased flooding impacts.
- Any surface water sewer connections will be made under the supervision of the Local Authority/Irish Water and checked prior to commissioning.
- New onsite surface water drains will be tested and surveyed prior to commissioning to prevent any possibility of ingress of ground water.
- All surface water manholes and drains will be inspected and sealed to ensure that uncontrolled ground water inflow does not occur.
- Filters and silt traps will be used to prevent rain washing silts and other materials into the surface water network and creating blockages.
- Areas surrounding the site are to be protected as necessary from sedimentation and erosion due to direct surface water runoff generated onsite during construction phase. To prevent this from occurring surface water discharge from the site will be managed and controlled for the duration of the construction works, as noted in the points above, until the permanent surface water drainage system of the proposed site is complete.
- Regular inspections of de-watering settlement tanks, if used, are to be carried out and additional treatment used if settlement is not adequate.
- Bunded areas will be created for the storage or use of any fuels, oils, greases, cement, etc.
- Emergency spill kits will be kept close to the works.

2.3.2.2 Surface-Water Run-Off: Operational Phase

As mentioned above, the proposed new surface-water drainage network will connect with the public storm-sewer network that discharges to Lough Mahon (Harper's Island) transitional waterbody via an existing outfall to the south-west of the study site where Cork Harbour SPA and Great Island Channel SAC are also present (see Figure 2.1). The proposed Sustainable Drainage Systems (SuDS) surface-water drainage design includes green roofing and permeable paving as well as hydrocarbon interceptors and attenuation tanks to ensure discharge to greenfield rates (see AECOM 2021c). Furthermore, the surface-water drainage network will be maintained on a regular basis in accordance with established guidelines (see AECOM 2021c). Operational related controls will be specific to the site, activities and Lough Mahon (Harper's Island) transitional waterbody with associated Cork Harbour SPA and Great Island Channel SAC.

2.3.2.3 Waste-Water/Foul Effluent

Prior to the residential site being connected into the public foul sewer network, **construction stage** waste-water/foul effluent will be managed and controlled at the temporary site compound through the use of portaloos and welfare units with storage tanks, where sanitary waste will be removed from site via a licenced waste disposal operator.

When the residential site is connected to the public foul sewer network, **construction (where relevant) and operational** waste-water/foul effluent arising from the proposed development will be collected by a new foul sewer network at site that will be directed into the public foul sewer network for treatment at

Cork City Wastewater Treatment Plant (WWTP). Treated waste-water from the WWTP is discharged into Lough Mahon, where sections of Cork Harbour SPA are several kilometres downstream of the WWTP discharge point (see Figure 2.1).

2.3.2.4 Other Wastes

Other wastes associated with the development will be collected and removed from site by licensed operators during the construction (see AECOM 2021d) and operational stages of the project. This will allow for the appropriate control and management of other wastes at site, with no uncontrolled releases of same into the environment including any Natura 2000 site.

Figure 2.1: Study Site Location & Natura 2000 Sites

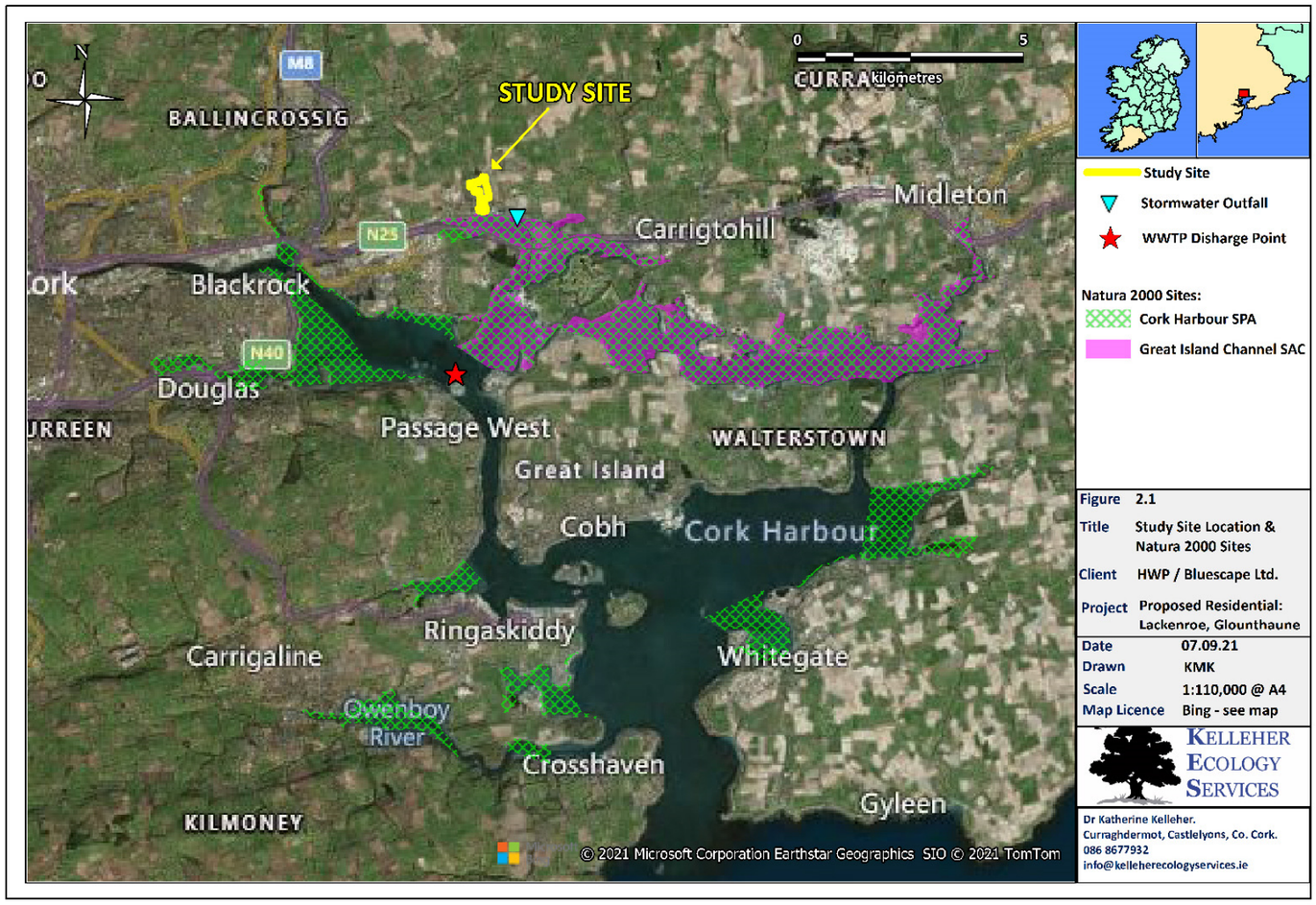
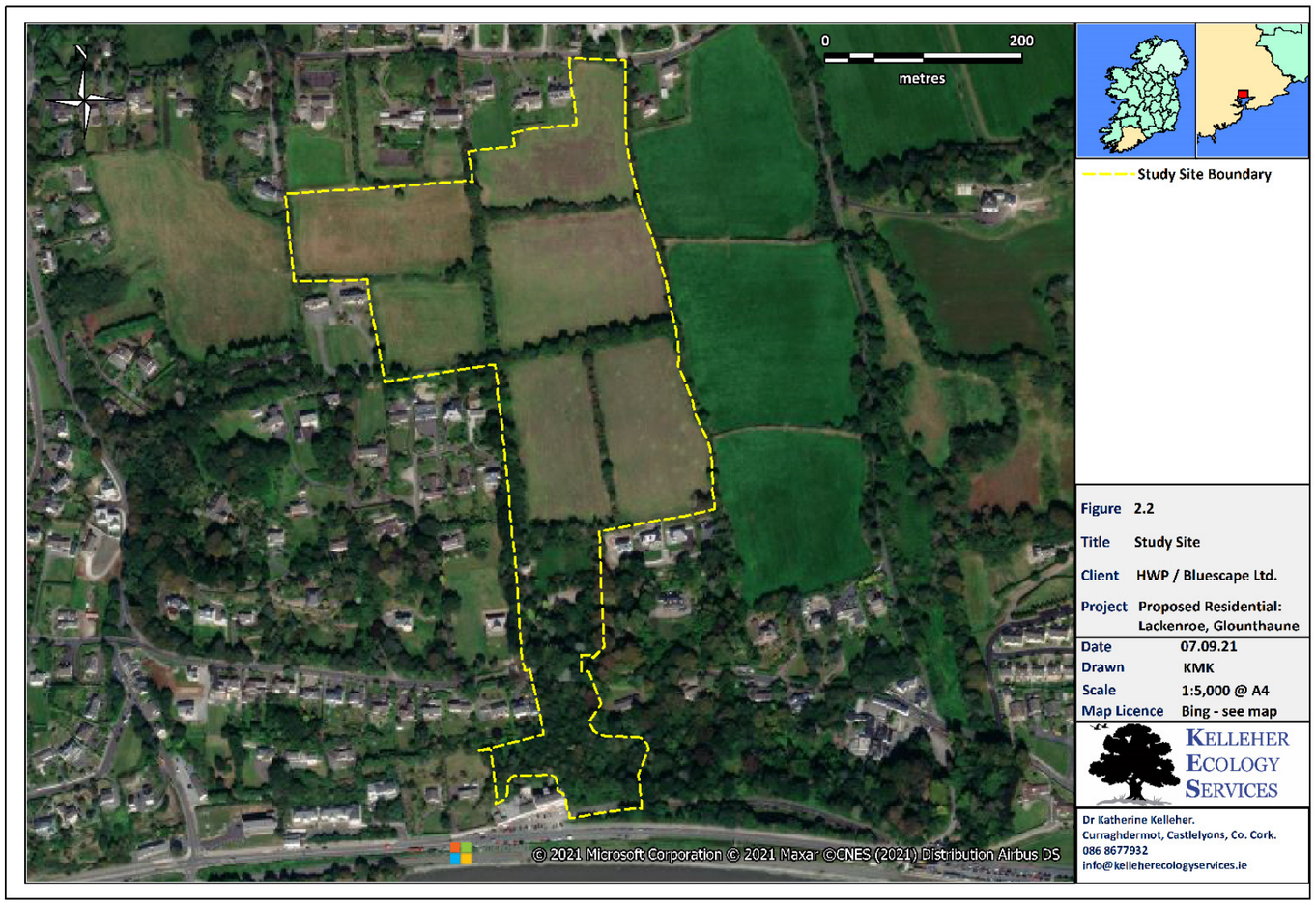


Figure 2.2: Study Site



3 Brief Description of the Natura 2000 Sites

Natura 2000 sites were identified through a desktop mapping review (using MapInfo Pro, a geographic information system software programme), where focus was given to sites where a potential impact-receptor pathway or zone of influence with the study site may be relevant. In other words, Natura 2000 sites that may potentially have a link to the study site were focused on as part of this assessment (*e.g.* through hydrological link, overlapping, proximity, ex-situ usage).

In this case, the study site is not part of or adjacent to any Natura 2000 designated sites nor does it require any resources from them, thereby ruling out any direct habitat loss at such conservation sites. The closest Natura 2000 sites are located from *c.* 42m south of the study site boundary, both overlapping Lough Mahon (Harper's Island) transitional waterbody; Great Island Channel SAC and Cork Harbour SPA (Figure 2.1 and Table 3.1 below). There are no other Natura 2000 sites in the wider area with an impact-receptor pathway relevant to the study site. While one other Natura 2000 site (Blackwater River (Cork/Waterford) SAC) is located within 15km of the study site, it is located within a different catchment area such that no potential indirect hydrological impact-receptor link is therefore possible.

3.1 Potential Impact-receptor Pathways: Overview

3.1.1 Surface-Water Run-Off

There is a potential impact-receptor link between the study site and Cork Harbour SPA and Great Island Channel SAC via surface-water run-off into Lough Mahon (Harper's Island) transitional waterbody. Construction stage surface-water run-off could potentially reach Lough Mahon (Harper's Island) transitional waterbody given the proposed connection into the public storm-sewer network that currently outfalls into this transitional waterbody and/or proximity of the development site to this waterbody (*i.e. c.* 40m; see Table 3.1). Operational surface-water run-off associated with the site will also be discharged into Lough Mahon (Harper's Island) transitional waterbody via the same public storm-sewer network (see Table 3.1). Both Cork Harbour SPA and Great Island Channel SAC overlap at the section of Lough Mahon (Harper's Island) transitional waterbody relevant to here including at the public outfall discharge point (see Figure 2.1). Therefore, the potential for an impact-receptor pathway between the study site and both Cork Harbour SPA and Great Island Channel SAC via surface-water discharge is given further consideration in Section 4.1 of this report.

3.1.2 Waste-Water/Foul Effluent

Prior to the site being connected into the public foul sewer, construction stage waste-water/foul effluent will initially be managed and controlled at the temporary site compound through the use of portaloos and welfare units with storage tanks, where sanitary waste will be removed from site via a licenced waste disposal operator. In this instance, there is no impact-receptor pathway between construction stage waste-water and any Natura 2000 site.

When the site is connected to the public foul sewer network, construction (where relevant) and operational stage waste-water/foul effluent arising from the proposed development will be discharged into the public foul effluent network for treatment at Cork City WWTP that ultimately

discharges into Cork Harbour at Lough Mahon, where sections of Cork Harbour SPA are >4km downstream of the WWTP discharge point (see Table 3.1 & Figure 2.1). Therefore, the potential for indirect hydrological impacts on Cork Harbour SPA via waste-water arising from the study site are further considered in Section 4.1 of this report.

While Great Island Channel SAC is not downstream of the WWTP discharge point (see Figure 2.1), tidal/wind movements could be of some relevance in relation to the SAC, where its boundary is *c.* 550m north-east of the WWTP's discharge point. However, an assessment on the conservation status of the SAC does not highlight potential impacts arising from tidal/wind movements from Cork City WWTP's discharge point as a significant point of concern but instead highlights water quality management in relation to two other WWTPs (Midleton & Carrigtwohill WWTPs) to maintain/restore the favourable conservation status of the SAC's qualifying interest 'Mudflats and Sandflats' (O'Neill *et al.* 2014). Taking the above into consideration, no significant adverse effects are considered likely in relation to waste-water/foul effluent arising from the proposed development and Great Island Channel SAC.

3.1.3 Disturbance/Displacement

Consideration needs to be given to the potential for disturbance/displacement impacts of fauna that are listed as qualifying interests of a designated site through noise and/or visual cues arising from the proposed development. This also includes ex-situ disturbance/displacement impacts on highly mobile species that are qualifying interests of the relevant designated site; ex-situ impacts occur when highly mobile species occur outside of the boundaries of their designated sites (*e.g.* to forage or commute).

The study site is located approximately 46m from the nearest section of Cork Harbour SPA as associated with Lough Mahon (Harper's Island) transitional waterbody. Cork Harbour SPA is designated for the protection of a range of qualifying interest waterbird species (see Table 3.1) that typically forage and roost along intertidal mudflats and coastal wetlands or fields. The potential for disturbance/displacement of SPA waterbird qualifying interest species as a result of the development are further considered in Section 4.1 of this report.

As the conservation objectives of Great Island Channel SAC relate to habitats and not fauna, there is no impact-receptor pathway in relation to disturbance/displacement for this SAC.

3.1.4 Invasive Plants

Activities associated with development works can inadvertently result in the spread of invasive plants, where an over-ground water-feature can subsequently act as a potential impact-receptor pathway regarding indirect habitat loss/damage to downstream locations in the wider area including any Natura 2000 sites that are present.

A number of non-native invasive plant species are present at the study site, where a dedicated Invasive Plants Survey and Management Plan has been developed in relation to the Third Schedule species (IPS 2021) and other non-native plant species that are not listed on the Third Schedule will also require management in accordance with best practice. While several non-native invasive plant species are present, there are no over-ground water-features at the study site that could act as a conduit for the spread of these species into the nearby transitional waterbody and associated Natura 2000 sites.

Taking the above into consideration, there is no impact-receptor pathway in relation to potential habitat loss/damage effects arising from the spread of invasive plants on either Cork Harbour SPA or Great Island Channel SAC.

3.1.5 Flooding/Floodplain

A site specific flood risk assessment has been completed for the proposed development that concludes that the study site does not have a known history of flooding, is within a low probability flooding area (*i.e.* flood zone C, less than 0.1% or 1 in 1,000 year event for river and coastal flooding) and has a low risk in relation to pluvial and groundwater flooding (see AECOM 2021a). The flood risk assessment also highlights that the proposed development will not increase flood risk elsewhere (see AECOM 2021a). Taking the above into consideration, no significant adverse effects regarding flooding/floodplain impacts on Cork Harbour SPA and Great Island Channel SAC considered likely here.

Table 3.1 Natura 2000 Site Summary

Natura 2000 Site & Code	Conservation Objectives	Minimum Distances
Great Island Channel SAC 001058	The Great Island Channel stretches from Little Island to Midleton, with its southern boundary being formed by Great Island. The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. This SAC overlaps with part of the Cork Harbour SPA, with its estuarine habitats providing foraging and roosting resources for wintering waders and wildfowl for which the SPA is designated. Its conservation objectives relate to maintaining the favourable conservation condition of the following qualifying interests (after NPWS 2014b); **Annex I Habitats:** Tidal Mudflats and Sandflats (1140), Atlantic Salt Meadows (1330).	<u>Site Boundary:</u> Over-land: 0.042km <u>Discharge Points:</u> Surface-water: 0.0km Waste-water: n/a
Cork Harbour SPA 004030	Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (*i.e.*>20,000). Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive. The site provides both feeding and roosting sites for the various bird species that use it. Its conservation objectives relate to maintaining the favourable conservation condition of the following qualifying interests (after NPWS 2014a); **Wintering bird species:** Little Grebe *Tachybaptusruficollis,* Grey Plover *Pluvialissquatarola,* Great Crested Grebe *Podicepscristatus,* Lapwing *Vanellus vanellus,* Cormorant *Phalacrocorax carbo,* Dunlin *Calidris alpine alpine,* Grey Heron *Ardeacinerea,* Black-tailed Godwit *Limosa limosa,* Shelduck *Tadorna tadorna,*Bar-tailed Godwit *Limosa lapponica,* Wigeon *Anas Penelope,* Curlew *Numenius arquata,* Teal *Anascrecca,* Redshank *Tringatetanus,*Pintail *Anasacuta,* Black-headed Gull *Chroicocephalus ridibundus,* Shoveler *Anas clypeata,* Common Gull *Larus canus,* Red-breasted Merganser*Mergus serrator,*Lesser Black-backed	<u>Site Boundary:</u> Over-land: 0.046km <u>Discharge Points:</u> Surface-water: *c.*0.0km Waste-water: > 4.0km

Natura 2000 Site & Code	Conservation Objectives	Minimum Distances
	Gull *Larus fuscus,* Oystercatcher *Haematopus ostralegus,* Golden Plover *Pluvialis apricaria.* **Breeding bird species:** Common Tern *Sterna hirundo.* **Habitat:** Wetlands.	

3.2 Potential Impact-Receptor Pathways: Summary

In summary, Section 4.1 of this NIS further considers; (i) potential construction/operational surface-water run-off impacts in relation to Cork Harbour SPA and Great Island Channel SAC (ii) potential construction (where relevant) and operational waste-water discharge impacts in relation to Cork Harbour SPA and (iii) potential disturbance/displacement impacts on qualifying waterbird interest species of Cork Harbour SPA.

4 Assessment: Natura Impact Statement

Elements of the proposed development that may potentially impact on the qualifying interests of the conservation objectives of Cork Harbour SPA and Great Island Channel SAC are further considered in Section 4.1 below.

4.1 Elements of the Project that may Potentially Impact on Qualifying Interests of the Natura 2000 Site

4.1.1 Indirect Habitat Loss or Deterioration

Indirect habitat loss or deterioration of Natura 2000 sites within the surrounding area can occur from the effects of run-off or discharge into the aquatic environment through impacts such as increased siltation, nutrient release and/or contamination. This requires connectivity between the site and the Natura 2000 site in question through watercourses and/or drainage. In this case, there is a potential impact-receptor pathway between (i) the study site and Cork Harbour SPA and Great Island Channel SAC in relation to surface-water run-off and (ii) the study site and Cork Harbour SPA through waste-water discharge as follows.

4.1.1.1 Surface-Water Run-Off: Construction Phase

The construction phase of the proposed development will involve various activities such as site clearance, vegetation removal, building demolition, excavation/earthworks, the import of building materials, use of heavy machinery and refuelling. Such activities have the potential to release silt or other contamination into Lough Mahon (Harper's Island) transitional waterbody given the proposed connection into the public storm-sewer network (where part of the proposed on-site drainage system may become active as construction works progress) that currently outfalls into this transitional waterbody and/or proximity of the development site to this waterbody (*i.e. c*. 40m). Both Cork Harbour SPA and Great Island Channel SAC overlap at the section of Lough Mahon (Harper's Island) transitional waterbody relevant to here including at the public outfall discharge point (see Figure 2.1).

Standard environmental controls will be implemented as part of the project to ensure the appropriate management and control of construction stage surface-water run-off potentially arising from development activities at the site (as outlined in Section 2.3.2.1). Such construction related controls will be specific to the site, works and Lough Mahon (Harper's Island) transitional waterbody with associated Cork Harbour SPA and Great Island Channel SAC. Construction phase surface-water environmental controls are thereby listed as part of mitigation measures under Section 4.2.1 of this report.

4.1.1.2 Surface-Water Run-Off: Operational Phase

Operational surface-water run-off associated with the site will also be discharged into Lough Mahon (Harper's Island) transitional waterbody via the same public storm-sewer network outlined above for the construction phase, where Cork Harbour SPA and Great Island Channel SAC are present at the outfall discharge point (see Figure 2.1).

Operational phase surface-water run-off will be managed and controlled prior to discharge into the environment, where the proposed SuDS drainage design will incorporate various features such as green roofing and permeable paving as well as hydrocarbon interceptors and attenuation tanks that will be maintained on a regular basis in accordance with established guidelines (as outlined in Section 2.3.2.2). Such operational related run-off controls will be specific to the site, activities and Lough Mahon (Harper's Island) transitional waterbody with associated Cork Harbour SPA and Great Island Channel SAC. Operational surface-water management proposals are thereby listed as part of mitigation measures under Section 4.2.2 of this report.

4.1.1.3 Waste-Water/Foul Effluent

When the site is connected to the public foul sewer network, there is a potential impact-receptor pathway via construction (where relevant) and operational waste-water/foul effluent links between the study site and Cork Harbour SPA via Cork City WWTP that ultimately discharges into Cork Harbour at Lough Mahon, where sections of Cork Harbour SPA are >4km downstream of the WWTP discharge point.

Even though Cork City WWTP is currently non-compliant in relation to Total Nitrogen and Phosphorus, ambient monitoring of transitional and coastal receiving waters indicates that discharge from the WWTP does not have an observable negative impact on water quality or the WFD status of the receiving waters (Irish Water 2021). Furthermore, the WWTP has sufficient capacity to accept the additional organic loading of 1,168 PE from the operational development, where remaining organic capacity is >100k PE (see Irish Water 2021); this has also been confirmed by Irish Water's pre-connection enquiry response that the proposed foul connection can be facilitated (see Appendix B).

Taking the above into consideration, no significant adverse effects regarding indirect habitat loss or deterioration of Cork Harbour SPA arising from waste-water via WWTP discharge are deemed likely in this case. Therefore, no mitigation measures are required in relation to potential waste-water related impacts.

4.1.2 Disturbance/Displacement

Activities associated with the construction phase of the proposed development could disturb and/or displace waterbird species associated with the nearby Cork Harbour SPA through noise and/or visual cues such as artificial lighting and the movement of construction machinery/personnel, where the nearest area of suitable waterbird habitat (mudflats) associated with this Natura 2000 site is located from *c*. 40m of the study site. Disturbance/displacement also includes ex-situ related impacts on highly mobile species that are qualifying interests of the relevant designated site; ex-situ impacts occur when highly mobile species occur outside of the boundaries of their designated sites (*e.g*. to forage or commute).

The busy Cork to Midleton / Cork to Cobh railway lines as well as a local road are located between the study site and these mudflats however, while the study site is also screened from the estuary/mudflats by a mature treeline/woodland strip along the inner side of the local road. The very busy N25 dual carriageway is also present *c*. 500m south of the study site on the opposite site of the mudflats. The existing and on-going background noise levels associated with vehicular/train movement on the public road and railway adjacent to the estuary/mudflats as well as the other existing urban infrastructure

associated with the wider Glounthaune/Little Island area will effectively outweigh the noise from the proposed construction works, particularly for waterbird qualifying interests located on mudflats adjacent to the public road/railway such that significant adverse effects regarding direct disturbance/displacement impacts on qualifying interest waterbirds occurring within Cork Harbour SPA are not considered likely here.

It is also considered that the project will not result in artificial light spillage into the SPA area as follows. During the construction phase, external based construction works will largely occur during daylight hours only, such that artificial lighting of external areas during the hours of darkness will be largely irrelevant with only limited occasions where construction works may occur during darkness. During the operational phase, no artificial lighting will be installed that will result in any light spillage into the SPA area during the hours of darkness (see AECOM (2021e) and Glounthaune Development Public Lighting drawing by Lighting Reality accompanying the planning application). Furthermore, the apartment block will not be fitted with aviation warning lights or other bright lights that might attract or disorientate waterbirds. Also, the study site is screened from the SPA by a mature treeline/woodland strip and the southern part of the site will retain a portion of the existing woodland as well as introduce relatively extensive new tree planting (see Landscape Master Plan Drawing No. 21543-2-101 by Cunnane Stratton Reynolds accompanying the planning application) that will minimise the visibility of the overall site from the nearby estuary. It should also be noted that railway infrastructure (*i.e.* Glounthaune platform), which is located between the study site and the estuary, is already subject to artificial lighting such that the local waterbird population are already habituated to these lighting levels.

In relation to ex-situ disturbance/displacement, the study site does not support habitats of ex-situ ecological value for qualifying interest species of the SPA in question where it is largely dominated by recolonising bare ground and woodland with associated hedgerows and treelines that obscure the view of the estuary from the study site. Furthermore, no qualifying interest species of Cork Harbour SPA were noted during the field surveys at the study site where the study site is not of known importance for waterbirds (see Crowe 2005 and IWeBS online mapping[3]).

Taking the above into consideration, no significant adverse effects regarding disturbance/displacement on qualifying interest waterbird species of Cork Harbour SPA are considered likely as a result of the construction or operation of the proposed development. Therefore, no mitigation measures are required in relation to potential disturbance/displacement (including ex situ) related impacts.

4.1.3 Cumulative or In-combination Effects

Potential cumulative effects include construction/operational related surface-water and construction (where relevant)/operational related foul effluent inputs, where qualifying interests associated with Cork Harbour SPA and Great Island Channel SAC could be subject to cumulative impact through hydrological or water quality impacts such as increased siltation, nutrient release and contaminated run-off arising from other developments.

[3] https://bwi.maps.arcgis.com/apps/View/index.html?appid=1043ba01fcb74c78bc75e306eda48d3a

The proposed project represents the second phase of residential development in accordance with a Masterplan developed by Deady Gahan Architects in 2017, where construction has recently commenced on the first phase that is west of the northern land parcel of the study site (under planning references 17/5699, 300128-17, 18/6312 and 20/5864). A proposed extension to the first phase, comprising of the demolition of two agricultural buildings and the construction of 21 units to the south of the Phase 1 site has also been submitted (Planning Reference 21/6851). Other proposed and permitted developments are present in the wider area, including; (i) a permitted Pedestrian and Cycle Route from Bury's Bridge, Kilcoolishal to Carrigtwohill via Glounthaune (Cork County Council Part 8 Application), (ii) proposed construction of 94 no. residential units (Barlow Properties ltd., planning number 21/5072), (iii) proposed construction of 12 no. residential units (Glounthaune Homes Trust, 21/4622) and (iv) permitted SHD of 174 residential units under construction (O'Mahony Developments Ltd., ABP-301197-18).

The current Cork County Development Plan outlines a county-based objective in relation to the management of surface-water by new developments through the incorporation of SuDS and provision of adequate stormwater infrastructure (Section 11.5 & Objective WS 5-1; CCC 2014) that is reiterated in the current Cobh Municipal District Local Area Plan that includes Glounthaune (Objective LAS-01; CCC 2017). The current Cobh Municipal District Local Area Plan also includes an objective for Glounthaune regarding protection of the SPA and SAC in relation to new development in the area (Objective U-02; CCC 2017). The SuDS surface-water management strategy associated with the proposed development here compliments the Cork County Development Plan objective through the inclusion of various aspects such as such as green roofing and permeable paving along with hydrocarbon interceptors and attenuation tanks (as outlined in Section 2.3.2 above).

While Cork City WWTP is currently non-compliant in relation to Total Nitrogen and Phosphorus, ambient monitoring of transitional and coastal receiving waters indicates that discharge from the WWTP does not have an observable negative impact on water quality or the WFD status of the receiving waters (Irish Water 2021). Furthermore, there is significant remaining capacity currently available at Cork City WWTP to cater for the additional proposed foul effluent here.

Assuming that all other Cork County related developments closely adhere to standard environmental practice regarding soil and water management during construction and operational phases, as per the development under consideration here (as outlined in Sections 2.3.2 above & 4.2.1 below), then significant adverse cumulative effects are considered unlikely in relation to water-features and associated designated nature conservation sites.

Taking the above into consideration, along with the proposed environmental management and controls integrated into the project design here (see Section 4.2.1 below), significant adverse effects related to cumulative and in-combination impacts are considered unlikely in this case.

4.2 Mitigation Measures Relevant to the Protection of the Natura 2000 Site

The following mitigation measures will be integrated as part of the proposed development regarding environmental protection specific to the site, works/operations and Lough Mahon (Harper's Island) transitional waterbody with associated Cork Harbour SPA and Great Island Channel SAC in relation to potential construction/operational phase surface-water run-off drainage effects.

4.2.1 Surface-Water Run-Off: Construction Phase

The following construction related run-off controls are proposed as part of the development in question (after AECOM 2021b);

Spill Control Measures

It is not proposed to store any oils/fuels for the purpose of refuelling on the site.

Onsite plant will be refuelled by an external contractor who will call to site as required. Road vehicles are not be refuelled at the site. Minor spills and leaks may occur from road vehicles and the onsite excavator. Any oils or fuels onsite will be removed by an experienced and authorised contractor.

- The following steps provide the procedure to be followed in the event of any significant spill or leak.
- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- Eliminate any sources of ignition in the immediate vicinity of the incident
- Contain the spill using the spill control materials, track mats or other suitable material. Do not spread or flush away the spill.
- Cover or bund off any vulnerable areas where appropriate such as drains or watercourses.
- Clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the Contractor immediately giving information on the location, type, and extent of the spill so that they can take appropriate action and further investigate the incident to ensure it has been contained adequately.
- The Employers Representative will inspect the site and ensure the necessary measures are in place to contain and clean up the spill and prevent further spillage from occurring.

Run-off Control Measures

- Dewatering measures will only be employed where there are no other alternatives.
- For groundwater encountered during construction phase, mitigation measures will include;
    - Dewatering by pumping to a soakaway.
    - Excluding contaminating materials such as fuels and hydrocarbons from sensitive parts of the site i.e. highly vulnerable groundwater areas.
- If concrete mixing is carried out on site, the mixing plant will be sited in a designated area with an impervious surface.
- Existing surface drainage channels within the site that serve adjacent lands will be retained where possible to prevent causing increased flooding impacts.
- Any surface water sewer connections will be made under the supervision of the Local Authority/Irish Water and checked prior to commissioning.
- New onsite surface water drains will be tested and surveyed prior to commissioning to prevent any possibility of ingress of ground water.
- All surface water manholes and drains will be inspected and sealed to ensure that uncontrolled ground water inflow does not occur.

- Filters and silt traps will be used to prevent rain washing silts and other materials into the surface water network and creating blockages.
- Areas surrounding the site are to be protected as necessary from sedimentation and erosion due to direct surface water runoff generated onsite during construction phase. To prevent this from occurring surface water discharge from the site will be managed and controlled for the duration of the construction works, as noted in the points above, until the permanent surface water drainage system of the proposed site is complete.
- Regular inspections of de-watering settlement tanks, if used, are to be carried out and additional treatment used if settlement is not adequate.
- Bunded areas will be created for the storage or use of any fuels, oils, greases, cement, etc.
- Emergency spill kits will be kept close to the works.

4.2.2 Surface-Water Run-Off: Operational Phase

Operational stage run-off proposals will be integrated into the development under consideration here that are summarised as follows (see AECOM 2021c);

- The proposed SuDS surface-water drainage design includes green roofing and permeable paving along with hydrocarbon interceptors and attenuation tanks.
- Maintenance of the drainage system will be carried out on an on-going basis to ensure the system is operating correctly. Maintenance will consist of inspection and assessment, with remedial measures undertaken where required.

4.3 Likely Success of the Mitigation Measures

The mitigation measures have been developed in accordance with current policy, regulations and guidelines as follows;

- Construction and Demolition Waste Management – a Handbook for Contractors and Site Managers published by FAS and the Construction Industry Federation 2002
- Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects' Department of the Environment, Heritage and Local Government, 2006 (SPGWMP)
- Waste Classification. List of Waste & Determining if Waste is Hazardous or Non-hazardous. Environmental Protection Agency, 2018
- Pollution Prevention Guidelines: Working at Construction and Demolition Sites, PPG6, UK Environmental Alliance (PPG6)
- Environmental Good Practice on Site Guide, C741, CIRIA 2015 (Fourth Edition)
- Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors, C532, CIRIA 2001
- The SuDS Manual CIRIA C753

4.4 Timescale for the Implementation of Mitigation Measures

- Construction related mitigation measures will be implemented prior to and/or in-tandem with the relevant works being carried out.

- Operational related mitigation measures will be implemented and maintained on an ongoing basis and will be integrated into the Health & Safety Plan for the site.

4.5 Contingency Plan for Mitigation Failure

- An Emergency Response Plan for the site will be compiled prior to the commencement of construction/enabling works.
- In the event of failure of the mitigation measure, the source of contamination will be removed as a matter of urgency by a suitably qualified contractor and the site closed until the relevant issue is addressed.
- In extreme cases, the Health & Safety Authority and the Fire Department and the Council will be notified.

4.6 Appropriate Assessment Report

Assessment of the Effects of the Project or Plan on the Integrity of the Natura 2000 Site	
Describe the elements of the project or plan (alone or in combination with other projects or plans) that are likely to give rise to significant effects on the site (from screening assessment)	Elements of the proposed development that may result in potential impacts on Cork Harbour SPA and Great Island Channel SAC in the absence of potentially relevant environmental protection measures include (i) potential construction/operational surface-water run-off impacts in relation to Cork Harbour SPA and Great Island Channel SAC. No significant adverse effects regarding indirect habitat loss or deterioration of Cork Harbour SPA arising from waste-water via WWTP discharge are deemed likely in this case such that no mitigation measures are required as outlined in Section 4.1.1.3. Also, no significant adverse effects regarding disturbance/displacement on qualifying interest waterbird species of Cork Harbour SPA are considered likely as a result of the construction or operation of the proposed development such that no mitigation measures are required as outlined in Section 4.1.2.
Set out the Conservation objectives of the site	The conservation objectives and qualifying interests of the relevant Natura 2000 sites are outlined in Table 3.1 above.
Describe how the project or plan will affect key species and key habitats. Acknowledge uncertainties and any gaps in information.	With the implementation of the mitigation measures specified in Section 4.2, no significant adverse effects related to indirect habitat loss or deterioration of the Natura 2000 sites arising from silt-laden or contaminated surface-water run-off associated with the construction or operational phases of the proposed development are deemed likely in this case.
Describe how the integrity of the site (determined by structure and function and conservation objectives) are likely to be affected by the project and plan (e.g. loss of habitat, disturbance, disruption, chemical changes, hydrological changes and geological changes *etc*.). Acknowledge uncertainties and any gaps in information.	With the implementation of the mitigation measures specified in Section 4.2, no significant adverse effects on the integrity of the site related to indirect habitat loss or deterioration of the Natura 2000 sites arising from silt-laden or contaminated surface-water run-off associated with the construction or operational phases of the proposed development are deemed likely in this case.
Describe what mitigation measures are to be introduced to avoid, reduce or remedy the adverse effects on the integrity of the site. Acknowledge uncertainties and any gaps in information.	Mitigation measures will be integrated as part of the proposed development regarding environmental protection specific to the site, works/operations and Lough Mahon (Harper's Island) transitional waterbody with associated Cork Harbour SPA and Great Island Channel SAC in relation to potential construction/operational phase surface-water run-off drainage effects. Construction/operational surface-water proposals are thereby listed as part of mitigation measures in Section 4.2 above.
Results of Consultation	
Name of agency or body consulted	**Summary of response**
Inland Fisheries Ireland (IFI, response received from Mr M. McPartland by email on 11th August 2021; see Appendix C)	IFI would ask that Irish Water signifies there is sufficient capacity in existence in the WWTP so that it does not overload either hydraulically or organically existing treatment facilities or result in polluting

	matter entering waters. IFI would ask that there be no interference with, bridging, draining, or culverting of any watercourse its banks or bankside vegetation to facilitate this development without the prior approval of IFI.
National Parks & Wildlife Service / Development Application Unit; The Heritage Council; An Taisce	No response from any received to date.

5 References

AECOM 2021a. Site Specific Flood Risk Assessment. Glounthaune SHD. Report accompanying the planning application.

AECOM. 2021b. Outline Construction & Environmental Management Plan. Glounthaune SHD. Report accompanying the planning application.

AECOM. 2021c. Glounthaune SHD Infrastructure Report. Report accompanying the planning application.

AECOM. 2021d. Outline Construction and Demolition Waste Management Plan. Proposed Residential Development at Glounthaune, Co. Cork. Report accompanying the planning application.

AECOM. 2021e. Proposed Residential Development, Glounthaune, Co. Cork. Site Lighting Design Proposal. Report accompanying the planning application.

CCC (Cork County Council). 2014. Cork County Development Plan 2014. Volume One: Main Policy Material.

CCC (Cork County Council). 2017. Cobh Municipal District Local Area Plan. Volume 1, Main Document.

CIRIA. 2015 (Fourth Edition). Environmental Good Practice on Site Guide. CIRIA C741. London, UK.

CIRIA. 2001. Control of water pollution from construction sites: guidance for consultants and contractors. CIRIA C532. London 2001.

Department of Environment, Heritage & Local Government (DoEHLG). 2009. Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities. DoEHLG, Dublin.

European Commission. 2021. Assessment of Plans and Projects in relation to Natura 2000 Sites – Methodical Guidance on the provisions of Article 6(3) and 6(4) of the 'Habitats' Directive 92/43/EEC. European Commission, Brussels.

European Commission. 2018. Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Commission Notice. Brussels, 21.11.2018.

Environmental Protection Agency (EPA). 2013. Integrated Biodiversity Impact Assessment – Streamlining AA, SEA and EIA Processes: Practitioner's Manual. EPA STRIVE Programme 2007–2013; Report Series No. 106. EPA, Wexford.

Bluescape Ltd. 2021. Lackenroe SHD. Volume II EIAR. Report accompanying the planning application.

IPS. 2021. Invasive Alien Plant Species: Site Assessment Report & Management Plan. Residential Development Lands, Lackenroe & Johnstown, Glounthaune, Co. Cork. Invasive Plant Solutions. For IDV Glanmire.

Irish Water. 2021. Annual Environmental Report 2020. Cork City D0033-01.

NPWS 2014a. Conservation Objectives: Great Island Channel SAC 001058. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS. 2014b. Conservation Objectives: Cork Harbour SPA 004030. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NRA (National Roads Authority). 2010. The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads. Revision 1. December 2010.

O'Neill, F.H., Brophy, J.T., Devaney, F.M., Nash, R. & Barron, S.J. 2014. Assessment of the Conservation Status of the Great Island Channel SAC (001058). Report for Cork County Council.

OPR (Office of the Planning Regulator). 2021. Appropriate Assessment Screening for Development Management. Practice Note PN01.

APPENDIX A:
Proposed Development[4]

[4] from DGA drawing number 20151/P/003 accompanying the planning application

APPENDIX B:
Irish Water Pre-Connection Enquiry Response

Aileen Prendergast
1st Floor Montrose House
Carrigaline Road, Douglas
Cork

21 October 2021

Uisce Éireann
Bosca OP 448
Oifig Sheachadta na
Cathrach Theas
Cathair Chorcaí

Irish Water
PO Box 448,
South City
Delivery Office,
Cork City.

www.water.ie

Re: Design Submission for Glounthaune, Cork, Co.Cork (the "Development") (the "Design Submission") / Connection Reference No: 0850513420

Dear Aileen Prendergast,

Many thanks for your recent Design Submission.

We have reviewed your proposal for the connection(s) at the Development. Based on the information provided, which included the documents outlined in Appendix A to this letter, Irish Water has no objection to your proposals.

This letter does not constitute an offer, in whole or in part, to provide a connection to any Irish Water infrastructure. Before you can connect to our network you must sign a connection agreement with Irish Water. This can be applied for by completing the connection application form at www.water.ie/connections. Irish Water's current charges for water and wastewater connections are set out in the Water Charges Plan as approved by the Commission for Regulation of Utilities (CRU)(https://www.cru.ie/document_group/irish-waters-water-charges-plan-2018/).

You the Customer (including any designers/contractors or other related parties appointed by you) is entirely responsible for the design and construction of all water and/or wastewater infrastructure within the Development which is necessary to facilitate connection(s) from the boundary of the Development to Irish Water's network(s) (the "**Self-Lay Works**"), as reflected in your Design Submission. Acceptance of the Design Submission by Irish Water does not, in any way, render Irish Water liable for any elements of the design and/or construction of the Self-Lay Works.

If you have any further questions, please contact your Irish Water representative:
Name: Dario Alvarez
Email: dalvarez@water.ie

Yours sincerely,

M O'Dwyer

Maria O'Dwyer
Connections and Developer Services

Stiúrthóirí / Directors: Cathal Marley (Chairman), Niall Gleeson, Eamon Gallen, Yvonne Harris, Brendan Murphy, Maria O'Dwyer
Oifig Chláraithe / Registered Office: Teach Colvill, 24-26 Sráid Thalbóid, Baile Átha Cliath 1, D01 NP86 / Colvill House, 24-26 Talbot Street, Dublin 1, D01 NP86
Is cuideachta ghníomhaíochta airmrithe atá faoi theorainn scaireanna é Uisce Éireann / Irish Water is a designated activity company, limited by shares.
Uimhir Chláraithe in Éirinn / Registered in Ireland No.: 530363

APPENDIX C:
Inland Fisheries Ireland Response

From: Michael McPartland
To: John O"Brien | HW Planning
Subject: Proposed Strategic Housing Development at Lackenroe, Glounthaune, Co. Cork.
Date: 11 August 2021 10:37:26

John

Thank you for your recent notification of the above-mentioned proposal.

It appears it is proposed to dispose of septic effluent from the development to the public sewer. IFI would ask that Irish Water signifies there is sufficient capacity in existence so that it does not overload either hydraulically or organically existing treatment facilities or result in polluting matter entering waters. Should this not be the case then please forward proposals for alternative treatment and disposal options.

IFI would ask that there be no interference with, bridging, draining, or culverting of any watercourse its banks or bankside vegetation to facilitate this development without the prior approval of IFI.

Michael Mc Partland
Senior Fisheries Environmental Officer.

Iascach Intíre Éireann
Inland Fisheries Ireland

Tel + 353 (0)26 412 21/2
Fax + 353 (0)26 412 23
Email michael.mcpartland@fisheriesireland.ie
Web www.fisheriesireland.ie

Sunnyside House, Macroom, Co. Cork, Ireland. P12 X602

Help Protect Ireland's Inland Fisheries

From: John O'Brien | HW Planning <jobrien@hwplanning.ie>
Sent: Thursday 5 August 2021 17:27
To: Macroom Info <Macroom@fisheriesireland.ie>
Cc: Info <info@hwplanning.ie>
Subject: Proposed Strategic Housing Development at Lackenroe, Glounthaune, Co. Cork.

Dear Sir/Madam

Please see attached regarding a proposed Strategic Housing Development at Lackenroe, Glounthaune, Co. Cork.
The attached have also been sent to you via hard copy.

Kind Regards

John O'Brien
Planning Consultant

HW Planning
5 Joyce House
Barrack Square,
Ballincollig, Co. Cork
---
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+353 (0)21 4873250

LinkedIn

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LACKENROE **SHD**

APPENDIX 9-6

Public Lighting

VOLUME III | Appendices

Proposed Residential Development, Glounthaune, Co. Cork

Site Lighting Design Proposal

May 2021

Quality information

Prepared by	Checked by	Approved by
David Coleman Electrical Engineer	Raffaele Cicchianni Principal Electrical Engineer	Raymond Reilly Associate Director

Revision History

Revision	Revision date	Details	Authorized	Name	Position
01	25/05/2021	Issued for Planning	RR	Raymond Reilly	Associate Director
02	02/12/2021	Issued for Planning	RR	Raymond Reilly	Associate Director

Prepared for:

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Table of Contents

1. Introduction

This report was generated for planning requirements and outlines the design intent and considerations to be taken with regard to the Public lighting scheme within the proposed development of Glounthaune, Ballynaroon, Glounthaune, Co. Cork. Refer to Figure 1 below.

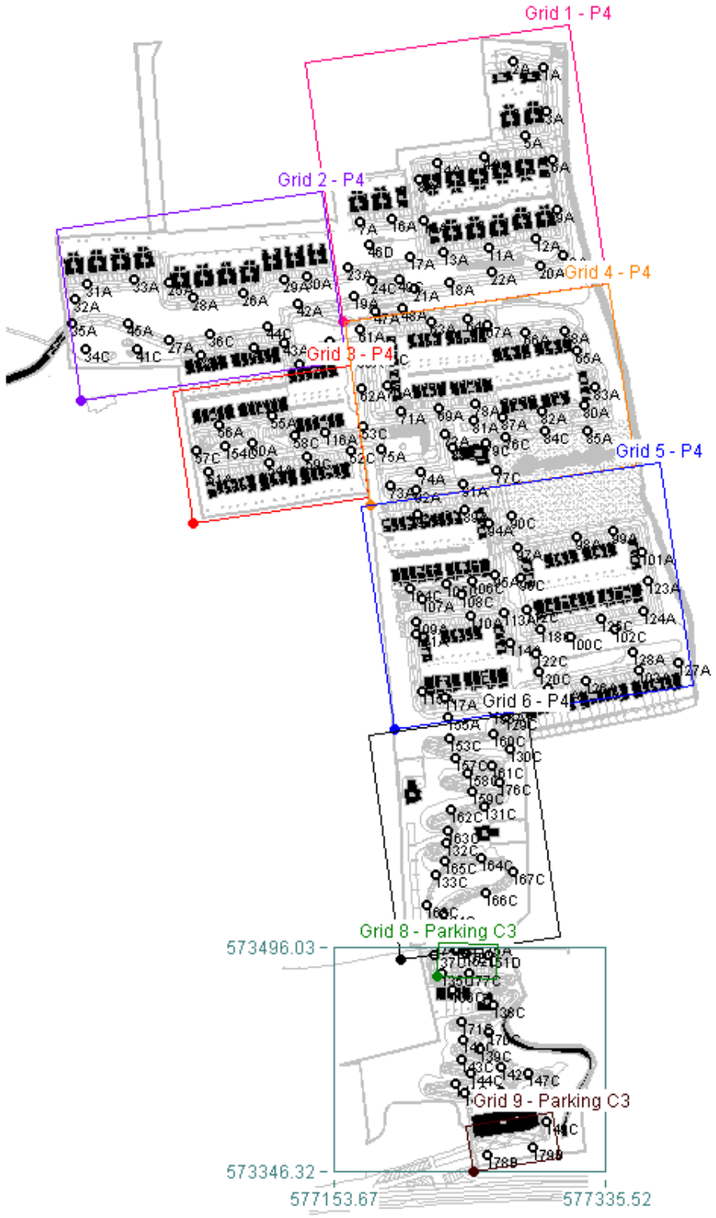

Figure 1: Proposed Development

The report considers the lighting design as developed by AECOM. The report has been developed with the following principal considerations:

I. Provide adequate illumination to contribute towards the safe use of the road and footpath by both vehicles and pedestrians.

II. Provide adequate illumination to contribute towards the safe use of the walkways and footpaths by pedestrians within the residential development.

III. Minimise light pollution and visual glare for pedestrians and neighbouring areas.

IV. Provide a visually interesting environment.

V. Minimise the impact of Public lighting on ecological creatures (Bats).

I. The complete external lighting installation will be designed in accordance with the regulations for electrical services as ETCI National Rules for Electrical Installations I.S. 10101: 2020 as well as BS5489-1:2020 Code of practice for the design of road lighting, IS EN 13201:2003-2, Cork County Council (Cork CoCo) – Product Lighting Manual and Product specification 2020.

The predicted performance of the external lighting installations has been assessed in detail using predictive lighting simulation software (Lighting Reality V2.1).

Our design comprises of column mounted lighting throughout the Glounthaune residential area is described in Section 6 and lighting control is detailed in Section 5. In each case, an indicative example of the type of luminaire and associated lamp specification has been included.

2. Design

As lighting designers, our proposed external lighting scheme, indicated on the accompanying drawing and associated verification report, is based on best practice, National Transport Authority guidance's and, more importantly, national & international industry standards, incorporating the following considerations.

I. Light pollution

II. Disability and discomfort glare

III. Sky glow

IV. Cork County Council (Cork CoCo) – Product Lighting Manual and Product specification 2020.

The key items that underpin our design are described below:

I. Compliance with lighting standards/ regulations for pedestrian footpath & road lighting functionality.
II. Mitigate light spill onto adjoining trees / neighbouring dwelling

To address the aforementioned the following measures were adopted:

I. Consciously positioned luminaires, so as to limit negative spill and light pollution whilst also maintaining the required lux levels uniformly across the pedestrian footpath around the development.

II. An asymmetrical beam optic is employed to physically contain unnecessary light spillage and light pollution.

III. Illumination levels within Glounthaune estate residential roads were kept to a minimum to meet the conditions of classification P4 (5 Lux average, with a minimum of 1 Lux, as set out in Table 3 of IS EN 13201-2:2015; this uniformity ratio of 0.2 has been achieved in all areas. Said scheme also complies with the National Transport Authority's (NTA) guidance's for cycle/pedestrian routes) at ground level as per Cork County Council requirements while maintaining uniformity. It should be noted that this minimum light level meets the minimum safe levels for pedestrians as set out in BS5489-1:2020.

IV. It is proposed that 6-metre-high LED lamp standards will provide illumination to the residential estate roads. This design is cognisant of the fact that light pollution both in terms of sky glow and light spill.

V. Illumination levels on the main road intersection at the entrance to the residential estate were kept to a minimum to meet the conditions of classification C3 (15 Lux average, Uniformity 0.4) at ground level.

VI. It is proposed that 8-metre-high LED lamp standards will provide adequate illumination at the intersection. This design minimises light pollution both in terms of sky glow and light spill.

VII. On the pedestrian walkway through the site and the pedestrian walkway exiting the site to the north of the site bollard luminaires are designed. These areas are designed to classification P4 (5 Lux average, with a minimum of 1 Lux, as set out in Table 3 of IS EN 13201-2:2015.

VIII. All lanterns have a colour temperature of 3000K.

Proposed Residential Development,
Glounthaune, Co. Cork

3. Standards

Adherence to the relevant Standards/ Regulations ensures a compliant public lighting design at the proposed residential development.

3.1 Reference Standards

- Energy & Efficiency & Performance Standard for Light Bulbs, Public Consultation Document, October 2008
- ETCI National Rules for Electrical Installations I.S. 10101: 2020
- BS 5489-1 (2020) Code of Practice for the Design of Road Lighting – Part 1: Lighting Roads and Public Amenity Areas
- IS EN 12464-2 (2011) 'Lighting for Workplaces. Outdoor Workplaces'
- IS EN 13201 (2015) Road Lighting – Part 2: Performance Requirements,
- Guidance Notes for The Reduction of Obtrusive Light' Institution of Lighting Engineers, 2021
- Guide to Obtrusive light, The ILE Guidance Notes on the Reduction of Obtrusive Light and CIE
- Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations
- Cork County Council (Cork CoCo) – Product Lighting Manual and Product specification 2020

3.2 Standards Used

Illumination levels on Glounthaune residential roads were kept to a minimum to meet the conditions of classification P4 (5 Lux average) at ground level and a minimum illuminance of 1lx as per Cork County Council requirements, as detailed in Table 1 below.

6 Requirements for pedestrians and pedal cyclists

6.1 General requirements

The P classes in Table 3 or the HS classes in Table 4 are intended for pedestrians and pedal cyclists on footways, cycleways, emergency lanes and other road areas lying separately or along the carriageway of a traffic route, and for residential roads, pedestrian streets, parking places, schoolyards, etc.

NOTE 1 Guidance on the application of the above-mentioned classes is given CEN/TR 13201-1.

The average illuminance ($\bar{E}$), the minimum illuminance (E_{min}), the average hemispherical illuminance ($\bar{E}_{hs}$) and the overall uniformity of the hemispherical illuminance (U_o) are to be calculated and measured according to EN 13201-3 and EN 13201-4.

The road area for which the requirements of Tables 3 and 4 apply can include all the road area such as carriageways on residential roads and reserves between carriageways, footways and cycleways.

NOTE 2 Limitation of disability glare can be demonstrated by evaluating f_{TI} values for all relevant combinations of observation directions and observer positions (see Annex C) or achieved by the selection of luminaires according to the classes G*1, G*2, G*3, G*4, G*5 or G*6 (see A.1).

NOTE 3 Limitation of discomfort glare can be achieved by the selection of luminaires according to the classes D1, D2, D3, D4, D5 or D6 of Annex A (see A.2). For the HS classes of Table 4, only the classes D5 or D6 are relevant.

Table 3 — P lighting classes

Class	Horizontal illuminance		Additional requirement if facial recognition is necessary	
	$\bar{E}$ [a] [minimum maintained] lx	E_{min} [maintained] lx	$E_{v,min}$ [maintained] lx	$E_{sc,min}$ [maintained] lx
P1	15,0	3,00	5,0	5,0
P2	10,0	2,00	3,0	2,0
P3	7,50	1,50	2,5	1,5
P4	5,00	1,00	1,5	1,0
P5	3,00	0,60	1,0	0,6
P6	2,00	0,40	0,6	0,2
P7	performance not determined	performance not determined		

[a] To provide for uniformity, the actual value of the maintained average illuminance shall not exceed 1,5 times the minimum $\bar{E}$ value indicated for the class.

NOTE 4 A high colour rendering contributes to a better facial recognition.

Table 1: Section 6.1 Table 3 of IS EN 13201-2

Illumination levels on the main road intersection at the entrance to the residential estate will be kept to a minimum to meet the conditions of classification C3 (15 Lux average, Uniformity 0.4) at ground level, as detailed in Table 2 below.

5 Requirements for conflict areas

The C classes in Table 2 are intended for drivers of motorized vehicles, and other road users, on conflict areas such as shopping streets, road intersections of some complexity, roundabouts, queuing areas, etc.

NOTE 1 Guidance on the application of these classes is given in CEN/TR 13201-1.

C classes can also be applied to areas used by pedestrians and pedal cyclists, e.g. underpasses.

The average illuminance ($\bar{E}$) and the overall uniformity of the illuminance (U_o) are to be calculated and measured in accordance with EN 13201-3 and EN 13201-4.

The road area for which the requirements of Table 2 apply can include the carriageway only, when applying separate requirements for the adequate lighting of other road areas for pedestrian and cyclists, or it can include also other road areas.

NOTE 2 Limitation of disability glare can be demonstrated by evaluating f_{TI} values for all relevant combinations of observation directions and observer positions (see Annex C) or achieved by the selection of luminaires according to the classes G*1, G*2, G*3, G*4, G*5 or G*6 (see A.1).

Table 2 — C lighting classes based on road surface illuminance

Class	Horizontal illuminance	
	$\bar{E}$ [minimum maintained] lx	U_o [minimum]
C0	50	0,40
C1	30	0,40
C2	20,0	0,40
C3	15,0	0,40
C4	10,0	0,40
C5	7,50	0,40

NOTE 3 The C classes are mainly intended for use when the conventions for road surface luminance calculations do not apply or are impracticable. This can occur when the viewing distances are less than 60 m and when several observer positions are relevant. The C classes are simultaneously intended for other road users on the conflict area. The C classes have further application for pedestrian and pedal cyclists in such cases, where P and HS classes defined in 6.1 are not adequate.

Table 2: Section 5 Table 2 of IS EN 13201-2

A.2 Comparability of lighting classes

Within an overall area to be lit there can be adjacent areas to which different parameters might apply, such as footways and cycle tracks adjacent to a carriageway within the boundaries of a road. In some situations it might be appropriate to apply different lighting classes or concepts to such adjacent areas. Table A.1 shows lighting classes from BS EN 13201-2:2003 and CIE 115:2010 [N1] and indicates those of comparable level, whether using luminance or illuminance criteria.

Table A.1 **Lighting classes of comparable level**

ME or M class	CE or C class	S or P class
—	CE0 or C0	—
ME1 or M1	CE1 or C1	—
ME2 or M2	CE2 or C2	–
ME3 or M3	CE3 or C3	S1 or P1
ME4 or M4	CE4 or C4	S2 or P2
ME5 or M5	CE5 or C5	S3 or P3
ME6 or M6	—	S4 or P4
—	—	S5 or P5
—	—	S6 or P6

NOTE The data in this table is extrapolated from PD CEN/TR 13201-1:2004 (undergoing revision).

Table 3: Lighting class Comparability Table; extract from BS 5489-1:2013

4. Light Pollution

Light pollution is a recognised statutory nuisance. Obtrusive light from installations must be minimised taking into consideration the following:

(i) Sky glow (direct upward waste light),

(ii) Light trespass (intrusive light and light into windows/windscreens),

(iii) Over illumination, glare (source intensity) and clutter.

Refer to illustration below…

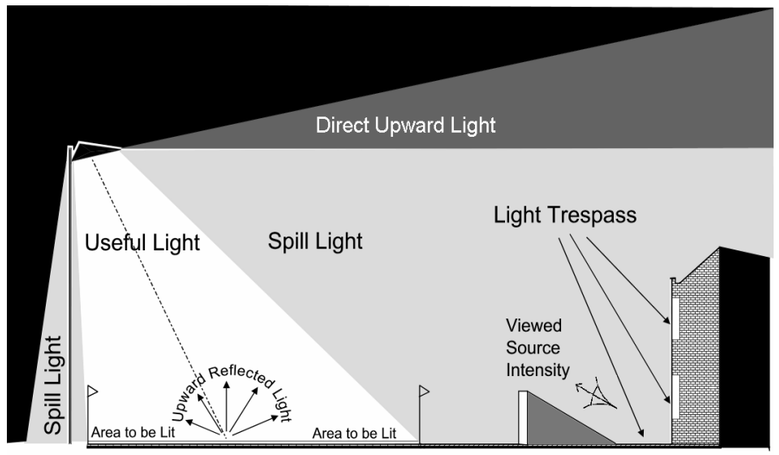

Figure 2: Light Spill

Outline predictive modelling software (Lighting Reality V2.2) has facilitated a study, which identifies and reduces potential light pollution.

Predictive modelling has further allowed for the optimum spacing of luminaires which minimise visual clutter from the artificial lighting scheme. Potential problems from glare and over-illumination have been considered and the design proposals use high quality optics coupled with aiming and commissioning to militate against these issues. Also, by optimizing illumination levels, it is possible to help mitigate against sky glow.

For the pedestrian and roadway lighting, it is proposed to utilise low wattage LED luminaires with +5/-20° inclination to the adjacent surface. Luminaires are positioned to comply with IS EN 16462-2 (2007) requirements meeting average Illuminance (E_m), uniformity (U_o) and glare rating (GRL) requirements.

5. Lighting Controls

Switching control of the lighting columns will be achieved by means of photocell control. Each individual luminaire shall be capable of being switched "ON" from dusk to dawn, unless otherwise requested by Cork Co. Co.

An individual solid-state Photo-Electric Control Unit (PECU) which will include a “fail safe” circuit that switches the luminaire on in the event of photocell failure will control each luminaire. The PECU will incorporate a phototransistor complying with I.S.428: 1991 as the light sensor, e.g. SELC 84 by Solar Enterprises Ltd., or equivalent approved by the Council. The unit will have a manufacturer's guaranteed warranty period of at least 6 years. The PECU will be designed to fit the National Electrical Manufacturers Association (NEMA) socket provided on each luminaire. Each luminaire will be fitted with a NEMA-type socket for mounting of the PECU unless otherwise directed by the Aecom Engineers. The socket will be fitted with a watertight gasket and secured by 4 non-corrodible screws that shall maintain the IP rating of the canopy. The NEMA socket shall be wired to the luminaire control circuit.

Figure 3: Photocell (PECU)

The maximum angle of light output from all the luminaires has no direct upward illuminance.

In accordance with the IS EN 12464-2; lighting and workplaces, it is calculated that the environmental zone will be E2, i.e., medium district brightness, with a maximum sky glow (URL) of 2.5%. Maximum light trespass (into windows in the surrounding buildings) of 5 lux and 1 lux at pre-curfew and post-curfew, respectively, source intensity of $7.5x10^3$ cd and $.5x10^3$ cd at pre-curfew and post-curfew, respectively, while the adjacent buildings luminance will be 25 cd max at pre-curfew; refer to figure 2.

A series of specific calculations using predictive modelling software results for test illuminance, luminous intensity, and glare from a range of angles relative to a light source was conducted. These concentrated on uniformity and glare in the roadway and pedestrian areas and on light spill and luminous intensity.

The public lighting scheme has been designed so as to maximise energy efficiency and to minimize light spill in so far as possible.

6. Conclusion

The public lighting design meets the requirements of Cork County Council and IS EN 13201 (2015) Road Lighting-Part 2.

Appendix A Lanterns

Below outlines the luminaires to be used in the various locations.

LANTERN REFERENCE	A, B and C	**Family**	Axia 3.1
LANTERN BODY :	Die-cast Aluminium, IP66 / IK10	**COLUMN DESCRIPTION:**	Root Mounted, Galvanised stainless steel or aluminium, 6m high from Ground Level
DIFFUSER TYPE:	N/A	**LAMPS:**	16.3W, 25.1W & 10.9W LED
REFLECTOR:	Wide Street optic	**COLOUR OF LAMPS:**	730, Warm White (WW)
CONTROL GEAR:	Photocell/Timeclock	**LAMP LIFE:**	100,000 hours, L90
AREA OF APPLICATION:	Residential Road Areas	**MANUFACTURER**	Urbis Schreder

Schedule of Columns & Lanterns

Ref	Type	Height	Tilt	Dim
1	A	6	0	100
2	A	6	0	100
3	A	6	0	100
4	A	6	0	100
5	A	6	5	100
6	A	6	0	100
7	A	6	0	100
8	A	6	0	100
9	A	6	0	100
10	A	6	0	100
11	A	6	0	100
12	A	6	0	100
13	A	6	0	100
14	A	6	0	100
15	A	6	0	100
16	A	6	0	100
17	A	6	0	100
18	A	6	0	100
19	A	6	0	100
20	A	6	0	100
21	A	6	0	100
22	A	6	0	100
23	A	6	5	100
24	C	6	5	100
25	A	6	5	100
26	A	6	0	100
27	A	6	0	100
28	A	6	5	100
29	A	6	5	100
30	A	6	5	100
31	A	6	0	100
32	A	6	5	100
33	A	6	0	100
34	C	6	0	100
35	A	6	0	100
36	C	6	0	100
37	A	6	0	100
38	A	6	0	100
39	A	6	0	100
40	A	6	5	100
41	C	6	0	100
42	A	6	0	100
43	A	6	0	100
44	C	6	0	100
45	A	6	0	100
46	D	6	5	100
47	A	6	5	100
48	A	6	5	100
49	C	6	5	100
50	A	6	0	100
51	A	6	5	100
52	C	6	5	100
53	C	6	0	100
54	A	6	5	100
55	A	6	5	100
56	A	6	0	100
57	C	6	0	100
58	C	6	0	100
59	C	6	5	100
60	A	6	0	100

Schedule of Columns & Lanterns

Ref	Type	Height	Tilt	Dim
61	A	6	0	100
62	A	6	0	100
63	A	6	0	100
64	A	6	0	100
65	A	6	5	100
66	A	6	0	100
67	A	6	0	100
68	A	6	0	100
69	A	6	5	100
70	A	6	0	100
71	A	6	5	100
72	A	6	0	100
73	A	6	0	100
74	A	6	0	100
75	A	6	0	100
76	C	6	0	100
77	C	6	5	100
78	A	6	5	100
79	C	6	0	100
80	A	6	0	100
81	A	6	0	100
82	A	6	0	100
83	A	6	5	100
84	C	6	0	100
85	A	6	0	100
86	C	6	0	100
87	A	6	0	100
88	C	6	0	100
89	A	6	0	100
90	C	6	5	100
91	A	6	0	100
92	A	6	0	100
93	A	6	0	100
94	A	6	0	100
95	A	6	0	100
96	C	6	0	100
97	A	6	0	100
98	A	6	0	100
99	A	6	0	100
100	C	6	5	100
101	A	6	0	100
102	C	6	5	100
103	A	6	0	100
104	C	6	0	100
105	C	6	0	100
106	C	6	0	100
107	A	6	0	100
108	C	6	0	100
109	A	6	0	100
110	A	6	5	100
111	A	6	0	100
112	C	6	5	100
113	A	6	0	100
114	A	6	0	100
115	A	6	0	100
116	A	6	0	100
117	A	6	5	100
118	C	6	0	100
119	A	6	0	100
120	C	6	0	100

Schedule of Columns & Lanterns

Ref	Type	Height	Tilt	Dim
121	A	6	5	100
122	C	6	0	100
123	A	6	0	100
124	A	6	0	100
125	C	6	0	100
126	A	6	0	100
127	A	6	0	100
128	A	6	0	100
129	C	6	5	100
130	C	6	0	100
131	C	6	0	100
132	C	6	0	100
133	C	6	0	100
134	C	6	0	100
135	C	6	5	100
136	C	6	0	100
137	C	6	0	100
138	C	6	5	100
139	C	6	0	100
140	C	6	0	100
141	C	6	0	100
142	C	6	0	100
143	C	6	0	100
144	C	6	0	100
145	C	6	0	100
146	C	6	0	100
147	C	6	0	100
148	C	6	0	100
149	C	6	0	100
150	D	6	0	100
151	D	6	0	100
152	D	6	0	100
153	C	6	0	100
154	C	6	0	100
155	A	6	0	100
156	A	6	0	100
157	C	6	0	100
158	C	6	0	100
159	C	6	0	100
160	C	6	0	100
161	C	6	0	100
162	C	6	0	100
163	C	6	0	100
164	C	6	0	100
165	C	6	0	100
166	C	6	0	100
167	C	6	0	100
168	C	6	0	100
169	C	6	0	100
170	C	6	0	100
171	C	6	5	100
172	E	6	0	Ped
173	E	6	0	Ped
174	A	6	0	100
175	A	6	0	100
176	C	6	0	100
177	C	6	5	100

	Luminaire A	Luminaire C	Luminaire D	Luminaire E
Supplier	Urbis Schreder	Urbis Schreder	Urbis Schreder	Urbis Schreder
Type	AXIA 3.1 5270 Integrated lenses 8 OSLON SQUARE GIANT@60...	AXIA 3.1 5296 Integrated lenses 8 OSLON SQUARE GIANT@40...	AXIA 3.2 5267 Integrated lenses 24 OSLON SQUARE GIANT@59...	AMPERA MINI 5144 Flat glass Zebra left 24 OSLON SQUARE GI...
Lamp(s)	8 OSLON SQUARE GIANT@600 mA WW 730 230V	8 OSLON SQUARE GIANT@400 mA WW 730 230V	24 OSLON SQUARE GIANT@590 mA WW 730 230V	24 OSLON SQUARE GIANT@700 mA WW 727 230V
Lamp Flux (klm)	1.96	1.35	5.66	6.03
Maintenance Factor	0.84	0.84	0.84	0.84
No. in Project	101	70	4	2

LIGHTING REALITY

PROJECT NAME: **Glouthaune Development Public Lighting**

PROJECT No: **60592432**

SCALE: **1:800** DATE: **1 September 2021**

CALCULATION: **Horizontal Illuminance (lux)**

DESIGNER: **Frank Kelly**

Maintenance Factor - 0.84
Lighting Designed to Class P4

Amended to New Layout 01-09-2021

PREPARED BY:

FILE NAME
\\na.aecomnet.com\lfs\EMEA\Belfast-UKBLF1\Legacy\UKBLF1FP002\WIP4\arcdata\ACAD\Lighting Reality Projects\Glounthaune\Glouthaune Urbis V6.rtma

Results Grid 1 - P4	
Eav	5.79
Emin	1.19
Emax	22.95
Emin/Emax	0.05
Emin/Eav	0.21
Results Grid 2 - P4	
Eav	5.54
Emin	0.53
Emax	16.27
Emin/Emax	0.03
Emin/Eav	0.10
Results Grid 3 - P4	
Eav	5.45
Emin	1.33
Emax	16.36
Emin/Emax	0.08
Emin/Eav	0.24
Results Grid 4 - P4	
Eav	5.59
Emin	1.14
Emax	16.62
Emin/Emax	0.07
Emin/Eav	0.20
Results Grid 5 - P4	
Eav	5.54
Emin	1.09
Emax	16.94
Emin/Emax	0.06
Emin/Eav	0.20
Results Grid 6 - P4	
Eav	5.71
Emin	1.16
Emax	15.42
Emin/Emax	0.08
Emin/Eav	0.20
Results Grid 7 - P4	
Eav	5.71
Emin	1.14
Emax	17.65
Emin/Emax	0.06
Emin/Eav	0.20
Results Grid 8 - C2	
Eav	20.29
Emin	8.67
Emax	34.63
Emin/Emax	0.25
Emin/Eav	0.43