

Natura Impact Statement

Further quarrying operations at Tromman Quarry

Keegan Quarries Ltd, Tromman, Rathmolyon, Co. Meath

August 2019



Report prepared for:

Quarryplan Ltd.
10 Saintfield Road
Crossgar
Downpatrick
Co. Down
BT30 9HY
Email: andy@quarryplan.co.uk

Report prepared by:

Woodrow Sustainable Solutions Ltd.
Main Street
Ballisodare
Co. Sligo
Telephone / Fax: 071 9140542
Email: info@woodrow.ie



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DOCUMENT CONTROL

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Client	Quarryplan Ltd.
Prepared by	Woodrow Sustainable Solutions Ltd Main Street, Ballisodare, Co Sligo, Ireland. T: +353 719140542
Author(s)	Kristi Leyden & Mike Trewby
Checked internally	Will Woodrow 26.08.2019
Checked by client	Andrew Scurfield (Quarryplan Ltd.) 26.08.2019
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STATEMENT OF AUTHORITY

This report was written by Kristi Leyden B.Agr.Sc. (Hons), M.Sc. GradCIEEM and Mike Trewby B.Sc, PGDip MCIEEM and has been checked and approved by Will Woodrow M.Sc. M.Sc. (Arch) CEcol MCIEEM.

Kristi is an Ecologist with Woodrow Sustainable Solutions Ltd. She has completed a B.Agr.Sc. (Hons) in Agri-Environmental Sciences and a M.Sc. in Ecological Assessment. Kristi is an experienced ecologist with over five years' experience in ecological surveys and assessment. She has carried out field work and reporting on a wide range of developments some of which include residential and commercial developments, wind farms, overhead power lines, gas lines, hydro schemes and quarries. Kristi is a Graduate member of the Chartered Institute of Ecology and Environmental Management (CIEEM).

Mike is a Senior Ecologist with Woodrow Sustainable Solutions Ltd and is full member of CIEEM. He has 20 years fieldwork and research experience in the field of ecology, predominately working the ornithological aspects of projects. Since 2011 he has worked as an ecological consultant and regularly carries out ecological impact assessment and monitoring for a range of development and projects. The report has been approved by Will Woodrow. Will is a Director at Woodrow Sustainable Solutions. He is an experienced ecologist with over 30 years of experience in ecological surveys and assessment. Will is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and a Chartered Ecologist.

As members of CIEEM, Kristi, Mike and Will are required to abide by a strict code of professional conduct in all aspects of this work.

Kristi Leyden – Qualifications:

B.Agr.Sc. (Hons) - Agri-Environmental Sciences. University College Dublin, 2008.

M.Sc. - Ecological Assessment. University College Cork, 2011.

Mike Trewby – Qualifications:

B. Sc - Zoology and Botany. University of Namibia, 1997.

Post Grad Dip - Environmental Studies. University of Strathclyde, 2002.

Will Woodrow – Qualifications:

HND - Conservation Management. Farnborough College of Technology, 1989.

M.Sc. - European Environmental Policy and Regulation. Lancaster University, 1994.

M.Sc. (Arch) - Advanced Environmental and Energy Studies. University of East London, 2006.

1 INTRODUCTION

1.1 Background

Woodrow Sustainable Solutions Ltd. (Woodrow) was commissioned by Quarryplan Ltd (Quarryplan) on behalf of Keegan Quarries Ltd. (“the Applicant”) to prepare a Natura Impact Statement (NIS) for the proposed further quarrying operations (the “Proposed Development”) at an existing quarry located in Tromman, Rathmoylan, Co. Meath (the “Site”).

This NIS includes details of an Appropriate Assessment Screening test which examined whether, in view of best scientific knowledge, and applying the precautionary principle, the proposed project, either individually or in combination with other plans or projects, is likely to have a significant effect on any European Site. European Sites, also known as Natura 2000 Sites, include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). The screening process and findings are covered in Section 3.

The aim of compiling this NIS is to determine in view of best scientific knowledge, applying the precautionary principle, and in light of the conservation objectives of the relevant European Sites, whether the proposed development, either alone or in combination with other plans or projects, may adversely affect the integrity of any European Sites.

This report provides information which can be used to assist the Competent Authority (An Bord Pleanála in this instance) in applying Article 6(3) and 6(4) of the Habitats Directive¹ as necessary, under their roles, functions and responsibilities in relation to the Appropriate Assessment of plans or projects.

The legislative context of the requirement to undertake Appropriate Assessment is outlined in the following section.

1.2 Legislative context

1.2.1 Requirement for Appropriate Assessment Screening

An Appropriate Assessment Screening provides the information necessary to fulfil the requirements of Article 6 of the EU Habitats Directive 1992 and Regulation 42 of the (Birds and Natural Habitats) Regulations 2011 in determining the potential impacts on Natura 2000 Sites of the proposal. The European Directive 92/43/EEC (The Habitats Directive) was transposed into Irish law by the European Communities (Natural Habitats) Regulations 1997 and European Communities (Birds and Natural Habitats) Regulations 2011 (Habitats Regulations). Regulation 42(1) of the 2011 Regulations requires that

“A Screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the Site as a Natura 2000 Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the Site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the Natura 2000 Site”.

If, following the screening process, a likely significant effect is predicted or cannot be ruled out; under Regulation 42(6), an Appropriate Assessment is required in order to determine the potential for impact

¹ Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora, as amended by Council Directive 97/62/EC. Available at: http://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm [Accessed July 2019].

on the integrity of a European Site. In the event of a negative assessment in terms of an adverse effect on Site integrity, a proposal can only be consented in the absence of feasible alternatives and for 'Imperative Reasons of Overriding Public Interest' (IROPI). In such cases, compensatory measures to ensure the integrity of the Natura 2000 Site is maintained, are required. The Guidance document on Article 6(4) of the 'Habitats Directive' states that:

*"any uncertainty over the precise nature and/or magnitude of the adverse effects should be thoroughly tested. Where appropriate, a precautionary approach should be adopted and the assessment of adverse effect based on a worse-case scenario."*²

1.2.2 Requirement for a Natura Impact Statement

The Appropriate Assessment test assesses whether, in view of best scientific knowledge and applying the precautionary principle, and in light of the conservation objectives of the relevant Natura 2000 sites, the proposed project, either alone or in combination with other plans or projects, may adversely affect the integrity of any Natura 2000 sites.

If, following the screening process, a potential significant effect is predicted or cannot be ruled out; under Regulation 42(6) an Appropriate Assessment is required in order to determine the potential for impact on integrity of a Natura 2000 site.

Regulation 42 (9) of the 2011 Habitats Regulations states:

Where a public authority is required to conduct an Appropriate Assessment pursuant to paragraph (6) in relation to a plan or project that it proposes to undertake or adopt, it shall:

- Prepare a Natura Impact Statement (NIS);
- Compile any other evidence including, but not limited to, scientific evidence that is required for the purposes of the Appropriate Assessment; and,
- Submit a Natura Impact Statement together with evidence compiled under *subparagraph (b)* to the Minister not later than six weeks before it proposes to adopt or undertake the plan or project to which the Natura Impact Statement and evidence relates.

Section 177AE of the Planning and Development Acts 2000 to 2001 (as inserted by section 57 of the Planning and Development (Amendment) Act 2010) set out the appropriate procedure for Local Authority projects with potential to impact on Natura 2000 Sites. This requires that, where an Appropriate Assessment is required in respect of a development by a local authority that is a planning authority, they will prepare, or cause to be prepared, a Natura Impact Statement. The Natura Impact Statement shall then be provided to *An Bord Pleanála* for them to undertake an Appropriate Assessment.

With the Screening for Appropriate Assessment having determined that potential significant effects on Natura 2000 Sites could not be ruled out (see Section 3 of this report), a Natura Impact Statement is required under Regulation 42(9) of the European Communities (Birds and Natural habitats) Regulations 2011. This Natura Impact Statement provides an assessment of the proposal considering potential impacts on Qualifying Interests within Natura 2000 Sites and provides mitigation proposals to avoid impacts on the integrity of Natura 2000 Sites. This allows for an audit trail through Article 6 of the EU Habitats Directive to facilitate an Appropriate Assessment by a competent authority.

² European Commission (2007) Available at:
http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/guidance_art6_4_en.pdf [Accessed July 2019].

1.3 Structure/ layout of the report

This Natura Impact Statement provides the information necessary for the Competent Authority, in this case An Bord Pleanála, to undertake an Appropriate Assessment of the proposal. The report sections, paragraphs and tables relate in sequence to the process of assessing the potential impact of the project in the context of sequential requirements of Article 6 of the EU Habitats Directive.

1.4 Main sources of information

The following information sources were consulted:

- Department of Environment, Heritage and Local Government (DoEHLG, 2009). Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities;
- European Community Habitats Directive (92/43/EEC) – The Habitats Directive;
- European Communities (Natural Habitats) Regulations 1997;
- European Commission Environment DG (2001). Assessment of plans and projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
- Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitats Directive 92/43/EEC;
- Environmental Protection Agency (EPA) Maps³;
- National Parks and Wildlife Services online MapViewer⁴;
- National Parks and Wildlife Service's data (downloaded GIS datafiles)⁵;
- Meath County Council Planning Portal⁶;
- Environmental Management System (EMS) for Keegan Quarries Ltd, Tromman Quarry, Rathmolyon, Co. Meath. Byrne Environmental (2009)
- Hydrogeological and Hydrological Assessment (BLC 2019) included in the Environmental Statement Part 3 as Appendix 6.1 (reviewed August 2019)
- Woodrow (2019a). Tromman Quarry, Co. Meath - Phase 1: Preliminary Ecological Assessment;
- Woodrow (2019b). Ecological Impact Assessment Report (EclA) for further quarrying operations at Tromman Quarry, Rathmolyon, Co. Meath (August 2019).

Woodrow carried out surveys within the site boundary on the following dates:

- 28 August 2018 - An Extended Phase 1 Habitat assessment and habitat mapping
- 16 October 2018 - An Extended Phase 1 Habitat assessment and habitat mapping
- 18-19 June 2019 - Bat and breeding bird surveys

The above surveys were intended to gain a better understanding of the development site, and the information gathered was used to inform this NIS and the EclA (Woodrow 2019b). For this NIS, the information gathered during site visits can be used to inform an assessment of the potential for any adverse effects upon the integrity of European Sites.

³ EPA Maps. Available at: <https://gis.epa.ie/EPAMaps/> [Accessed July 2019].

⁴ NPWS Map Viewer. Available at: <http://webgis.npws.ie/npwsviewer/> [Accessed July 2019]

⁵ NPWS Maps and Data. Available at: <https://www.npws.ie/maps-and-data> [Accessed July 2019].

⁶ Meath County Council Planning Portal. Available at: [Accessed July 2019]

<http://lp4.meathcoco.ie/locationpublisher42/default.aspx?themename=Planning&topicname=Planning> [Accessed July 2019].

2 DESCRIPTION AND FEATURES OF THE PROJECT AND AREA

2.1 Location

The neighbouring enterprises of Keegan Quarries Ltd, Tromman Quarry and the pre-cast concrete manufacturing facility (totalling 21.46 ha) are located in the townland of Tromman, Rathmolyon in Co. Meath. The linear site extends on the northern side of the R156 Rathmolyon-Ballivor road. The site is situated approximately 2.2 km northwest of Rathmolyon Village, 6.4 km south of Trim and 9 km north of Enfield. The centroid of the site can be found at Irish grid reference N 77749 50250. The quarry site location in the context of the wider landscape is presented in Figure 1.

2.2 Description of the quarry site

The evolution of activities that have occurred with the Tromman Quarry site have a well-documented planning history. The original consent for quarrying activity dates back to 1998 and was followed by ancillary consents in 2001 and 2003 that provided consent for the blockmaking plant and pre-cast concrete manufacturing facility in the northern part of the site. In 2004 approval was provided for the bulk of what is currently the operational quarry (c. 13.94 ha). Permission was granted to enlarge the extraction area of the quarry further (c. 2.85 ha) and since 2012 quarrying activities have expanded into the south-eastern corner of the site. This resource has not yet been fully exhausted.

The quarry site is bounded to the west by Kilsaran's Tromman Quarry, to the south by the regional road R156 and to the north and east by agricultural fields (see Figure 1).

2.3 Description of proposed development

The proposed development of further quarrying activities at Tromman Quarry, as shown in the quarry development schematics below (Figure 2), initially involves the quarry face progressing laterally to the excavation boundary in the south and south-eastern margin of the site and then developing to a depth of 13mAOD. The spoil heap between the existing quarry and the pre-cast concrete manufacturing facility can then be moved and placed in the quarry void in the southern margin. Re-locating the overburden, facilitates a lateral extension of quarry activity to the excavation boundary in the north and will also involve advancing the western face c. 20-25 m, which will enlarge the extraction area by c. 2.55 ha and again down to a final depth of 13mAOD. It is estimated that a total of c.9,429,000 tonnes of target mineral should be released in this development.

The concrete batching plant, block-yard and pre-cast concrete manufacturing facility in the northern end of the site are beyond the proposed extraction area and will remain in situ. The approved drainage infrastructure (three-stage settlement tank system and licensed discharge point) is located along the north-eastern boundary of the site adjacent of the pre-cast concrete manufacturing facility.

Once the quarry is exhausted, a site restoration plan will be implemented to deliver benefits to wildlife and through planting, as well as, natural regeneration, the range and extent of habitats occurring on the site will be increased to provide opportunities for a range of species – see summary in Figure 3.

The following summarises the phases of the proposed quarrying activities and the schematics below provide visual representation of the proposed expansion at Tromman Quarry.

Phase 1 – Extraction will be focused primarily in the southern margin of the site. The preparatory works for the eastern and southern quarry face expansion has largely been completed under a previous consent, including the removal of a bungalow and stripping of vegetation and some overburden. A garage associated with the bungalow remains will also be demolished and removed.

Phase 2 – Quarrying activity continues to be concentrated in the southern margin of the site, increasing the depth of the quarry to 13mAOD.

Phase 3 – The northern spoil heap, estimated at c. 338,000 m³ of material, will be removed and placed into the void in the southern margin of the quarry. It is proposed that the majority of the 13mAOD bench will be filled up to the 28mAOD level. This will form the initial stages in the site restoration process. As the spoil heap is removed, the extraction will be progressed in a northerly direction, with some westerly expansion (20-25 m) of the quarry face.

Phase 4 – Extraction continues to progress along the lower benches of the quarry in a northerly direction.

Site restoration – A site restoration plan has been produced for the proposal and an overview is shown in Figure 3 below. This outlines that the site restoration will result in the following (approximate) areas for the site as a whole (i.e. includes the decommissioning and removal of the manufacturing facility, permitting restoration of the area):

- Floating islands 0.507 ha
- Dry woodland 2.080 ha
- Wet woodland 0.507 ha
- Calcareous grassland 2.250 ha
- Hazel copse 0.125 ha
- Ponds x 8 ponds
- The remainder will be retained as open water within the quarry void.

The water level is expected to be maintain at approximately 65 m AOD following cessation of operations, with the top of the quarry banks on the southern and western areas varying from 75 m to 85 m AOD. This will result in cliffs of 10-20 m surrounding the quarry following restoration.



Figure 1. Tromman Quarry - site location in the context of the wider landscape



Figure 2. Phased development plans for Tromman Quarry

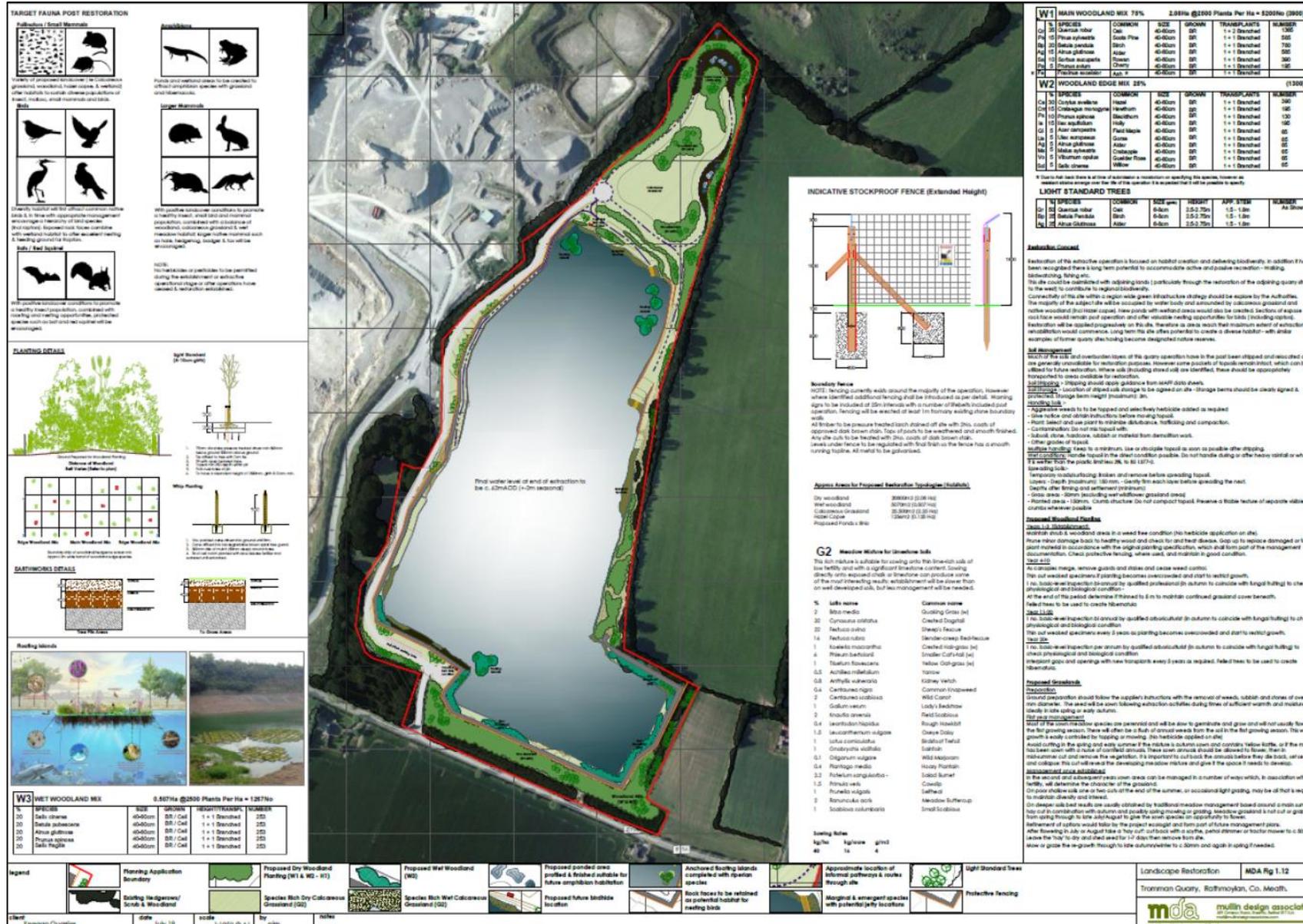


Figure 3. Overview of site restoration plans for Tromman Quarry

3 SCREENING FOR APPROPRIATE ASSESSMENT

NATURA 2000 SITES POTENTIALLY WITHIN THE ZONE OF INFLUENCE OF THE SITE

As stated above, European Directive 92/43/EEC (The Habitats Directive) requires that any plans or projects that could, alone or in combination with other plans or projects, affect a Natura 2000 site, be subject to screening for potential significant effect on any Natura 2000 site.

3.1 Screening Assessment of Natura 2000 sites

The following section provides information on the Natura 2000 sites in the vicinity of the quarry site at Tromman, Co. Meath which have the potential to be within the zone of influence of the proposal for further mineral extraction. In many cases a standard 15 km distance from a subject is used as a potential zone of influence within which Natura 2000 sites should be screened for potential impact. However, in reality, the potential impacts on Natura 2000 sites are dependent on the nature of impacts arising, the sensitivity of receptors and the causal links and conduits, rather than distance. In many cases the potential zone of influence is considerably less than 15 km (for example noise and airborne pollution) while the potential zone of influence could be greater than 15 km, for example if there is a direct water connection.

Natura 2000 Sites with potential pathways for impacts are identified in order to establish the zone of influence of the proposal. These can then be assessed based on factors such as proximity to the proposal, the Qualifying Interests (QI's) of the Natura 2000 Sites (and the species or habitats upon which these rely), and their conservation status. A screening matrix, shown in Table 1 below, is provided which illustrates the potential impacts, and any potential significant effect of the proposals on these Natura 2000 sites.

The screening process highlights that three Natura 2000 Sites: River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA and Mount Hevey Bog SAC occur within 15 km of the quarry site (see Figure 4 & Figure 5).

The quarry site is approximately 13 km north west of the Mount Hevey SAC. The quarry site is approximately 1 km south west of the River Boyne and River Blackwater SAC in direct distance (see Figure 4 & Figure 5) and is approximately 9.7 km south east of the quarry site via a hydrological connection (see Figure 6 & Figure 7). The quarry site is approximately 2.6 km south east of the River Boyne and River Blackwater SPA in direct distance (see Figure 4 & Figure 5) and it approximately 9.7 km south east of the quarry site via a hydrological connection (see Figure 6 & Figure 7).

Note: All ingress waters (groundwater and rainfall runoff) within the Tromman Quarry landholding are discharged, under control, into a ditch at the north-eastern corner of the concrete products yard. This ditch gently descends to the northwest to its confluence with the Rathmolyon Stream, which is c. 200 m downstream from the quarry discharge point. EPA mapping (see Figure 6) shows the hydrological link with the SAC and SPA to be immediately northwest of the site, via the Rathmolyon Stream flowing into the Tromman Stream, which is designated as SAC along this section. However, during the course of site investigations this was not found to be the case; and the Rathmolyon Stream was found to turn perpendicular to the SAC (Tromman Stream) and flows north into the Knightsbrook stream, as correctly depicted in Figure 7.

Each of the Natura 2000 Sites within 15 km of the quarry site is listed in Table 1; along with the QIs for each site and the potential for the proposal to affect them is considered. A conclusion on the potential for the proposal to have a significant effect on the QIs (and therefore the Natura 2000 site) is made.

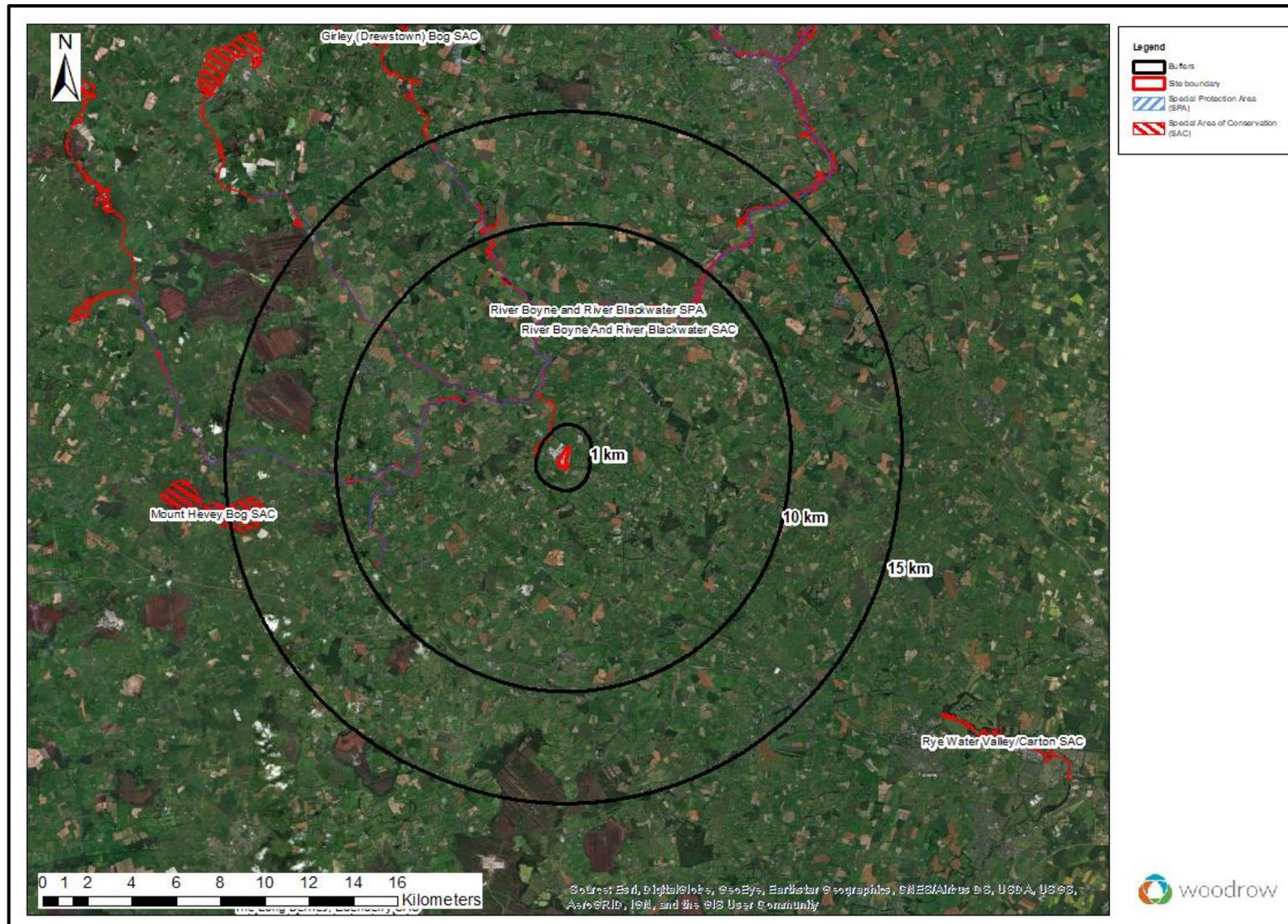


Figure 4. Natura 2000 Sites within 15 km of the Tromman Quarry, Co. Meath (illustrated by the red-lined boundary).

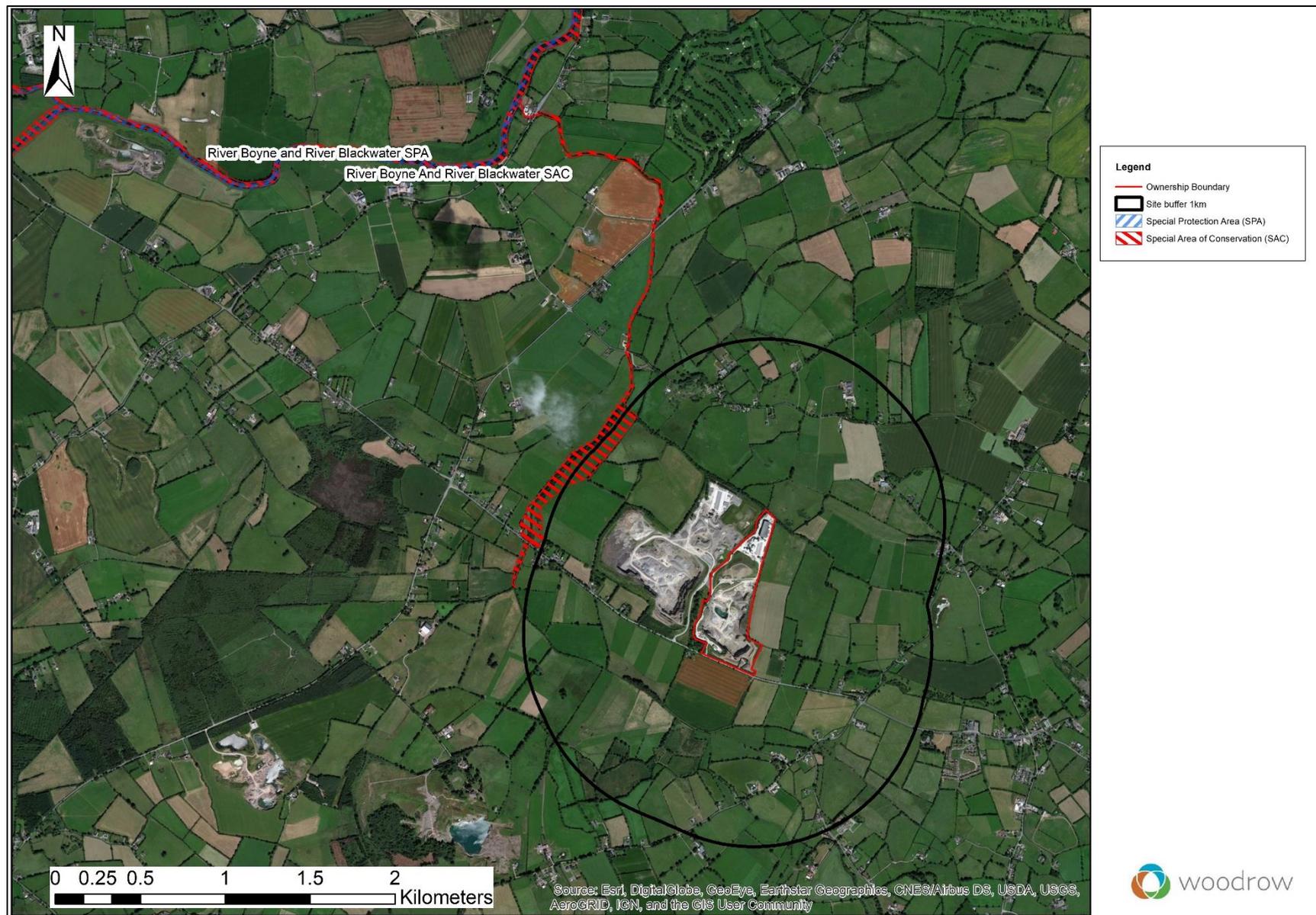


Figure 5. Natura 2000 Sites within 1 km of the Tromman Quarry site



Figure 7. Simplified surface water map illustrating the hydrological links between the quarry site and the River Boyne and River Blackwater SAC. For ease, the waterbody north of the quarry site is being referred to as the Knightsbrook Stream (as this is the largest section of this hydrological link) and the stream south of the quarry site is referred to as the Tromman Stream.⁸

⁸ Note the hydrological link immediately north of the site was found to run perpendicular to the River Boyne and River Blackwater SAC and not flow directly into it as is shown in the EPA maps in Figure 6.



Table 1: Screening Matrix of Impacts on all Natura 2000 sites in the vicinity of the proposed development

Explanation of terms used in Significance of Impact Matrix:

Likely Significant Effect - Where a plan or project is likely to undermine any of the Site’s conservation objectives;

Possible Significant Effect - Where a plan or project has an indicated potential to undermine any of the Site’s conservation objectives, but where doubt exists about the risk of a significant effect in the current context. Nevertheless, where doubt exists about the risk of a significant effect, use of the precautionary principle requires this effect to be considered appropriately within the Article 6 assessment

Sites highlighted in grey have the potential to be affected by the Proposal.

European Site Name (Site Code)	Qualifying Interests (QI’s) {QI code} * = Priority Habitats	Approximate Distance of the European Site from the quarry site at the Closest Point	Within the Zone of Influence?	Description of the Proposal	Potential for Significant Effects and nature of potential impact ^{9,10}
River Boyne and River Blackwater SAC (002299)	<ul style="list-style-type: none"> River lamprey (<i>Lampetra fluviatilis</i>) [1099] Salmon (<i>Salmo salar</i>) [1106] Otter (<i>Lutra lutra</i>) [1355] Alkaline fens [7230]¹¹ Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)* [91E0] 	<p>1 km to the north west in direct distance</p> <p>1.6 km to the south and then west along a hydrological link (see Figure 7)</p> <p>9.7 km to the north east along a hydrological link (see Figure 7)</p>	Yes	<p>Further mineral extraction</p> <ul style="list-style-type: none"> Storage and movement of overburden Maintenance of site waters Drilling and blasting Crushing and hauling Transport to and from Site Restoration and afteruse 	<p>Possible Significant Effects –</p> <p><u>Operational quarry</u> Potential water pollution (hydrocarbon and sediment) during the maintenance of site waters.</p> <p>Potential surface water/ groundwater pollution (sediment) during drill and blast.</p> <p>Potential water pollution (hydrocarbon and sediment) during crush and haul.</p> <p>Potential water pollution (hydrocarbon and sediment) during transport to and from site.</p> <p><u>Site restoration phase</u> Potential water pollution (hydrocarbon, cement and sediment) during the restoration works.</p> <p>De-watering activities will cease and therefore there will be no hydrological link between the site and the SAC</p> <p>Creation of ponds and a quarry lake will provide potential otter habitat post-restoration</p>

⁹ EPA Maps - <https://gis.epa.ie/EPAMaps/> - Information from this website has been used to assist this screening exercise.

¹⁰ EPA Flood Maps - <http://www.floodinfo.ie/map/floodmaps/> - Information from this website has been used to assist this screening exercise.



European Site Name (Site Code)	Qualifying Interests (QI's) {QI code} * = Priority Habitats	Approximate Distance of the European Site from the quarry site at the Closest Point	Within the Zone of Influence?	Description of the Proposal	Potential for Significant Effects and nature of potential impact ⁹¹⁰
<p>River Boyne and River Blackwater SPA (004232)</p>	<ul style="list-style-type: none"> Kingfisher (<i>Alcedo atthis</i>) [A229] 	<p>2.6 km north west in direct distance</p> <p>9.7 km to the north east along a hydrological link (see Figure 7)</p>	<p>Yes</p>	<p>Further mineral extraction</p> <ul style="list-style-type: none"> Storage and movement of overburden Maintenance of site waters Drilling and blasting Crushing and hauling Transport to and from Site Restoration and afteruse 	<p>Possible Significant Effects –</p> <p><u>Operational quarry</u> Potential water pollution (hydrocarbon and sediment) during the maintenance of site waters.</p> <p>Potential surface water/ groundwater pollution (sediment) during drill and blast.</p> <p>Potential water pollution (hydrocarbon and sediment) during crush and haul.</p> <p>Potential water pollution (hydrocarbon and sediment) during transport to and from site.</p> <p>Potential water pollution (hydrocarbon, cement and sediment) during site restoration works.</p> <p><u>Site restoration phase</u> Potential water pollution (hydrocarbon, cement and sediment) during the restoration works.</p> <p>De-watering activities will cease and therefore there will be no hydrological link between the site and the SPA</p> <p>Creation of ponds and a quarry lake will provide potential otter habitat post-restoration</p>
<p>Mount Hevey Bog SAC (002342)</p>	<ul style="list-style-type: none"> Active raised bogs* [7110] Degraded raised bogs still capable of natural regeneration [7120] Depression on peat substrates of the Rhynchosporion [7150] 	<p>13 km to the south west</p>	<p>No</p>	<p>Further mineral extraction</p> <ul style="list-style-type: none"> Storage and movement of overburden Maintenance of site waters Drilling and blasting Crushing and hauling Transport to and from Site Restoration and afteruse 	<p>None –</p> <p>Given the location of this project (approximately 13 km away from this SAC) and the fact that the habitats within the SAC are not hydrologically linked (and the habitats are rain-water fed regardless), it is considered that there is no realistic potential for significant effect.</p>

Table 2. Screening Matrix of the Proximity of Qualifying Interests of Natura 2000 sites with the zone of influence to the quarry site

Qualifying Interests in grey have the potential to be affected by the Proposal.

River Boyne and River Blackwater SAC (002299)		
Qualifying Interests (QI's) {QI code}	Proximity of the Qualifying Interest to the quarry site	Qualifying Interest within the Zone of Influence?
<i>* = Priority Habitats</i>		
River lamprey (<i>Lampetra fluviatilis</i>) [1099]	River lamprey are present in the lower reaches of the Boyne River ¹² . The quarry site is linked to the mid and upper reaches of the River Boyne. Using the precautionary principle, this QI is taken to be within the zone of influence.	Yes
Salmon (<i>Salmo salar</i>) [1106]	Salmon use the tributaries and headwaters as spawning grounds. Salmon run the River Boyne almost every month of the year ¹² .	Yes
Otter (<i>Lutra lutra</i>) [1355]	Otter can be found throughout the SAC ¹² .	Yes
Alkaline fens [7230]	The main areas of alkaline fen in the SAC are concentrated in the vicinity of Lough Shesk, Freehan Lough and Newtown Lough which are approximately 27 km north west of the quarry site. There is no hydrological link between this section of the SAC and the quarry site.	No
Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)* [91E0]	Wet woodland fringes many stretches of the Boyne. Although the wet woodland areas appear small there are few similar examples of this type of alluvial wet woodland remaining in the country, particularly in the north-east ¹² .	Yes
River Boyne and River Blackwater SPA (004232)		
Qualifying Interests (QI's) {QI code}	Proximity of the Qualifying Interest to the quarry site	Qualifying Interest within the Zone of Influence?
<i>* = Priority Habitats</i>		
Kingfisher (<i>Alcedo atthis</i>) [A229]	This SPA includes the River Boyne and several of its tributaries ¹³ .	Yes

¹² NPWS (2014). River Boyne and River Blackwater SAC (Site Code: 002299). Site Synopsis. Rev 13.Doc. Available at: <https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY002299.pdf> [Accessed July 2019].

¹³ NPWS (2010). River Boyne and River Blackwater SPA (Site Code: 004232). Site Synopsis. Available at: <https://www.npws.ie/sites/default/files/protected-sites/synopsis/SY004232.pdf> [Accessed July 2019].

3.2 Results and conclusions of Screening for Appropriate Assessment

The proposal involves further quarrying activities within the existing quarry at Tromman, Co. Meath. The location of proposal is within an area that has been an active quarry since 1998. The proposal is described in more detail in Section 2.3.

The Proposed Development is not connected with or necessary for the management of any Natura 2000 sites. The quarry (i.e. the red line boundary, see Figure 1) is not located within any Natura 2000 site; however, it is hydrologically linked to two Natura 2000 sites. The quarry site is approximately 1 km south east in direct distance and is linked approximately 9.7 km to the south east along a hydrological link to the River Boyne and River Blackwater SAC. The quarry site is approximately 2.6 km south east in direct distance and approximately 9.7 km to the south west along the closest hydrological link of the River Boyne and River Blackwater SPA. These Natura 2000 Sites are within the zone of influence which poses the risk of direct and indirect impacts¹⁴ and therefore the risk of significant effects, on these Natura 2000 Sites and their QIs.

Below, the two Natura 2000 sites, River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA, and their QIs which are considered to be within the Zone of Influence are listed. Due to the fact that these Natura 2000 sites could be affected by the Proposed Development for the reasons outlined below, it is deemed necessary using the precautionary principle to 'screen in' these Natura 2000 sites and to undertake an Appropriate Assessment in order to consider if the Proposed Development could affect the integrity of these Natura 2000 sites.

3.2.1 River Boyne and River Blackwater SAC (002299)

3.2.1.1 Qualifying Interests (QIs) within the Zone of Influence

The quarry site is approximately 1 km south east in direct distance and is linked approximately 1.6 km to the west and 9.7 km to the south east along a hydrological link to the River Boyne and River Blackwater SAC - see Figure 7. Therefore, the Proposed Development has the potential to result in indirect water quality impacts. Measures will need to be in place in order to protect the local aquatic ecology from the proposal. Considering this, this Natura 2000 Site is deemed in this instance to 'screen in' and require an Appropriate Assessment.

The following QIs of the River Boyne and River Blackwater SAC could be affected by hydrological impacts:

- River lamprey (*Lampetra fluviatilis*) [1099]
- Salmon (*Salmo salar*) [1106]
- Otter (*Lutra lutra*) [1355]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)* [91E0].

3.2.1.2 Conservation Objectives for the QIs within the Zone of Influence

The generic conservation objectives for river lamprey, salmon, otter, alkaline fen and alluvial forests is to maintain the favourable conservation condition of the habitat / species (NPWS 2018a).

¹⁴In this report, direct impacts constitute direct or primary impacts to Natura 2000 sites, for example habitat loss or mortality of QI species. Indirect or secondary impacts constitute pollution of water courses which may flow into a Natura 2000 site.

3.2.2 River Boyne and River Blackwater SPA (004232)

3.2.2.1 Qualifying Interests (QIs) within the Zone of Influence

The quarry site is approximately 2.6 km south east in direct distance and approximately 9.7 km to the south west along the closest hydrological link of the River Boyne and River Blackwater SPA - see Figure 7. Therefore, the Proposed Development has the potential to result in indirect water quality impacts. Measures will need to be in place in order to protect the local aquatic ecology from the proposal. Considering this, this Natura 2000 Site is deemed in this instance to 'screen in' and require an Appropriate Assessment.

The following QI's of the River Boyne and River Blackwater SPA could be affected by hydrological impacts:

- Kingfisher (*Alcedo atthis*) [A229]

3.2.2.2 Conservation Objectives for the QIs within the Zone of Influence

The generic conservation objectives for kingfisher is to maintain the favourable conservation condition of the bird species (NPWS 2018b).

3.3 Conclusions – Screening Assessment

Following the screening process above, the screening matrix of all impacts (Table 2) ruled out Natura 2000 sites for further assessment based on distance and the lack of a source-pathway-receptor linkage between the QIs and their specific sensitivities, and the Proposed Development. Two Natura 2000 Sites, River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA, have been identified as being in the zone of influence.

Without consideration of the on-site conditions and pre-existing mitigation measures, the Screening for Appropriate Assessment has concluded that there was and is potential for Potential Significant Effect on River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA and that a Natura Impact Statement is required. These Natura 2000 sites and QIs within the zone of influence (presented in Table 2 and above) are assessed in Table 3 as part of the Appropriate Assessment process. The Natura Impact Statement (NIS) is presented from Section 4 of this report.

4 IMPACT ASSESSMENT

DESCRIPTION OF NATURA 2000 SITES AND QIs POTENTIALLY AFFECTED

4.1 Natura 2000 Sites Identified within the Screening for Appropriate Assessment

The Screening for Appropriate Assessment (Section 3) specifically deals with the potential for likely significant effects on Natura 2000 sites / European sites and Qualifying Interests (QIs) of these sites, and where this arises, the Natura Impact Statement aims to assess whether the development may have or is adversely affect the integrity of any Natura 2000 sites.

The conclusions of the Screening for Appropriate Assessment exercise can be found in Section 3.3 of this NIS. The Screening for Appropriate Assessment concluded that potential significant effects on the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA could not be ruled out at the screening stage. The AA screening identified that the Proposed Development is hydrologically connected to both these Natura 2000 sites - see Figure 7, with potential source-pathway receptor linkages that might result in a conclusion of significant impact. Specifically, there was considered to be a potential significant effect on the salmon, lamprey, otter and alluvial woodland QIs of the SAC and kingfisher a QI of the SPA, due to potential for a deterioration of water quality resulting from activities associated with the development (since there is shown to be hydrological connectivity, although distant approximately 10 km between Tromman Quarry and the River Boyne and River Blackwater SAC and SPA, via the Knightsbrook stream).

In terms of the River Boyne and River Blackwater SAC and SPA, the following assessment considers the potential effects of water quality changes on the associated habitat and species features. Specific issues relating to the effect of distance, existing mitigation and effluent monitoring at the site are addressed. In all instances, a worst-case scenario (pollution incident) is assessed against the pre-existing mitigation, as well as operational mitigation (as detailed within the Hydrogeological and Hydrological Assessment - BCL 2019). The assessment is concentrated solely on the features and potential impacts highlighted in the screening assessment, i.e. impacts relating to water quality on salmon, lamprey, otter, alluvial woodland and kingfisher

A worst-case scenario would occur whereby the development would result in a significant detrimental change in water quality in the stream located to the north of the site either alone or in combination with other projects or plans as a result of indirect pollution.

Table 3. Potential Significant Effects Matrix for Natura 2000 sites and Qualifying Interests (QIs) within the zone of influence with the potential to be Significantly Affected by the proposal.

Natura 2000 site	Code	Qualifying Interest (QI)	Connectivity	Potential Impact type and effect	Potential Cause
River Boyne and River Blackwater SAC (002299)	[1099]	River lamprey <i>Lampetra fluviatilis</i>	9.7 km to NE via hydrological link (see Figure 7)	Reduction in water quality through: - sedimentation resulting in inhibition of respiration in aquatic organisms, particularly salmonids - siltation resulting in smothering of fish eggs and affecting suitability of spawning locations - accidental release of toxic chemicals (hydrocarbons) and materials (cement & concrete) into surface waters directly poisoning fish and aquatic organisms Prolonged deterioration in water quality would impact on food sources for otter, as well as salmon and lamprey Pollution to surface waters (limnic, terrestrial, marine & brackish) is noted as having an impact on alluvial woodland in Ireland, however the occurrence is low (O'Neill <i>et al.</i> 2013) Positive ecological impacts are likely to be associated with the site restoration including the creation of a lake, which could provide potential habitat for otter.	Quarry activities Quarrying activities without appropriate mitigation in place could impact on water quality locally; however, given the distance of the hydrological link, only the accidental release of extreme volumes of toxic substances would have the potential to impact the Natura 2000 sites Site restoration De-watering activities will cease and this will further diminish the hydrological link between the Natura 2000 sites and the development
	[1106]	Salmon <i>Salmo salar</i>			
	[1355]	Otter <i>Lutra lutra</i>			
	[91E0]	Alluvial forests with <i>Alnus glutinosa</i> & <i>Fraxinus excelsior</i> * (Alno-Padion, Alnion incanae, Salicion albae)			
River Boyne and River Blackwater SPA (004232)	[A299]	Kingfisher <i>Alcedo atthis</i>	9.7 km to NE via hydrological link (see Figure 7)	Prolonged deterioration in water quality would impact on food sources for kingfisher Excessive levels of discharge have the potential to alter water levels, which potentially impacts on kingfisher nesting holes in riverbanks through bank erosion and inundation Positive ecological impacts are likely to be associated with the site restoration including the creation of a lake, which could provide potential habitat for kingfisher.	Quarry activities Quarrying activities without appropriate mitigation in place could impact on water quality locally; however, given the distance of the hydrological link, only the accidental release of extreme volumes of toxic substances would have the potential to impact the Natura 2000 sites Site restoration De-watering activities will cease and this will further diminish the hydrological link between the Natura 2000 sites and the development

4.2 Description of Natura 2000 Sites within the zone of influence

Appendix 1 provides a copy of the site synopsis for the River Boyne and River Blackwater SAC

Appendix 2 provides a copy of the site synopsis for the River Boyne and River Blackwater SPA

4.3 Assessment of potential impacts

The screening assessment concluded that potential significant effects on the River Boyne and River Blackwater SAC and River Boyne and River Blackwater SPA could not be ruled out at the screening stage. Specifically, in the absence of mitigation, there was considered to be a potential significant effect on the salmon, lamprey, otter and alluvial woodland QIs of the SAC and kingfisher a QI of the SPA, as a result of potential deterioration of water quality due to quarry activities (since there is shown, to be hydrological connectivity, although distant at approximately 10 km between Tromman Quarry and River Boyne and River Blackwater SAC and SPA, via the Kingsbrook stream).

In terms of the River Boyne and River Blackwater SAC and SPA, the following sections consider the potential effects of water quality changes on the associated habitat and species features. Specific issues relating to the effect of distance, existing mitigation and effluent monitoring at the site are addressed.

In all cases, the embodied mitigation in the design and approach of the proposal, as well as proposed operational mitigation (as detailed within the Hydrogeological and Hydrological Assessment, BCL 2019) are considered.

The assessment is concentrated solely on the features and potential impacts highlighted in the screening assessment, i.e. impacts relating to water quality affecting salmon, lamprey, otter, alluvial woodland and kingfisher

4.3.1 River Boyne and River Blackwater SAC

4.3.1.1 Status of designated features within the SAC

The River Boyne and River Blackwater SAC supports important population of three species listed on Annex II of the E.U. Habitats Directive, namely:

River lamprey (*Lampetra fluviatilis*)

- present in the lower reaches of the Boyne River

Salmon (*Salmo salar*)

- run the River Boyne almost every month of the year and the Boyne is important as it represents an eastern river which holds large three-sea-winter fish

Otter (*Lutra lutra*)

- occur throughout the site.

The SAC also holds the priority Annex I habitat Alluvial forests with *Alnus glutinosa* & *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*)* and while the area of wet woodland is small there are few similar examples of this type of alluvial wet woodland remaining in the country, particularly in the north-east. The semi-natural habitats, particularly the strips of woodland which extend along the river banks, and the marsh and wet grasslands, increase the overall habitat diversity and add to the ecological value of the site.

4.3.1.2 Impacts of water pollution

The Annex II species listed as QIs of the SAC, specifically salmon, lamprey and otter are sensitive to water pollution. Reduction in water quality through sedimentation can result in inhibition of respiration in aquatic organisms, particularly salmonids. Siltation can result in smothering of fish eggs and affecting suitability of spawning locations. The accidental release of toxic chemicals (e.g. hydrocarbons) and materials (e.g. cement & concrete) into surface waters can directly poison fish and other aquatic organisms. Prolonged deterioration in water quality would impact on food sources for otter, as well as salmon and lamprey

Alluvial forests are generally removed from the water environment, except in times of flooding and are not considered to be at risk from water pollution in this instance. The main threats to alluvial forests include fragmented nature, abundance of alien invasive species and sub-optimal grazing regimes and drainage (O'Neill *et al.* 2013). It is considered that there is no reasonable potential link, as there is no link to land use within SAC and therefore no potential for influencing grazing regimes or drainage.

4.3.1.3 Potential for impact

As detailed in Section 6, control measures are currently in place within the Tromman Quarry to mitigate against contamination of surface waters, including the construction of a surface water and ground water management system in 2009 - see Environmental Management System (EMS - Byrne Environmental 2009, updated 2019) and water monitoring. The water management system was upgraded further in 2016 to incorporate concrete settlement tanks (see Hydrogeological and Hydrological Assessment, BCL 2019). Further monitoring upgrades, included the installation of a V-Notch weir that has been fitted with a data logger (April 2019), which takes head measurements every 15 minutes.

With the mitigation measures outlined in the EMS in place (see Section 6) and with surface runoff directed to and collected in the settlement tanks for discharge via the consented discharge point (as covered by Trade Effluent Discharge Licence Ref. 04/2), the risk of local watercourses and ground waters becoming contaminated as a result of further mineral extraction at this site is considered to be low. It is considered that these measures were sufficient to ensure protection of the downstream SAC from any level of impact, as demonstrated by the monitoring data and EPA data showing the good water quality status assessment for the Knightsbrook stream.

During site restoration the mitigations measures outlined in Section 6 will still be in place; and as such, the risk of downstream impacts, should any pollution events occur on site will be sufficiently controlled. Positive ecological impacts are likely to be associated with the site restoration including the creation of a lake, which could provide potential habitat for otter. In addition, de-watering activities will cease and this will further diminish the hydrological link between the Natura 2000 sites and the development.

4.3.2 River Boyne and River Blackwater SPA

4.3.2.1 Status of designated features within the SPA

Kingfisher [Natura 2000 code A229]

The River Boyne and River Blackwater SPA supports a nationally important population of kingfishers, 19 pairs recorded in 2010 and 20-22 territories recorded in 2008.

4.3.2.2 Impacts of water pollution

Potential impacts mainly relate to significant pollution events that may affect the birds directly or a gradual decline in the water quality that could impact on food availability, mainly in the form of small fish, as well as aquatic invertebrates. Indirect impacts on kingfisher would possibly occur if water quality was significantly reduced having an effect on food sources.

4.3.2.3 Potential for impact

As with the potential for impact on the SAC, it is considered that the water control and pollution prevention measures currently in place (as detailed in Section 6) are sufficient to ensure protection of the downstream SPA from any level of impact, as demonstrated by the monitoring data. The proposed development will result in no change to these measures. It is therefore concluded that further quarrying activities at Tromman Quarry will not have the potential to impact on kingfisher, the sole feature of interest for the River Boyne and River Blackwater SPA.

During site restoration the mitigations measures outlined in Section 6 will still be in place; and as such, the risk of downstream impacts, should any pollution events occur on site will be sufficiently controlled. Positive ecological impacts are likely to be associated with the site restoration including the creation of a lake, which could provide potential habitat for kingfisher. In addition, de-watering activities will cease and this will further diminish the hydrological link between the Natura 2000 sites and the development.

5 CONSIDERATION OF 'IN-COMBINATION' IMPACTS

Article 6 of the EU Habitats Directive and Regulation 15 of the European Communities (Natural Habitats) Regulations state that any plan or project that may, either alone or in combination with other plans or projects, significantly affect a Natura 2000 site should be the subject of an Appropriate Assessment. The assessment of in-combination impacts is therefore an important part of the screening process.

In-combination impacts can be an issue when proposals have a small impact on Natura 2000 sites as a result of factors such as disturbance or pollution. If other proposals also have a further small impact, the combined result can be a significant impact on the Natura site.

The only potential impacts on Natura 2000 sites likely to originate from the quarry over its operational lifespan will result from:

- potential deterioration of water quality within River Boyne and River Blackwater SAC and SPA resulting from quarrying activities, since there is hydrological connectivity between the discharge point from the development and the SAC/ SPA, via the Knightsbrook stream.

Other potential impacts are considered either absent or *de minimis*. The issues, therefore, are the potential cumulative impact of deterioration in water quality resulting from the proposed further mineral extraction at Tromman Quarry, in combination with other sources within the River Boyne catchment and more specifically the Knightsbrook catchment. Meath County Council plan portal shows the location of other quarries within the Knightsbrook catchment, which vary considerably in scale, current level of activity and materials extracted and include the following six sites:

- Kilsaran's quarry at Tromman – neighbouring quarry and block factory
- Farrelly at Castletown

- Fitzsimons at Rathmolyon
- Dixsons at Tobertynan
- Des Keegan & Sons Ltd at Cloncowan
- Roadstone Trim at Bray Hill, Stokestown just south of Trim

Other permitted and built development in the area is characteristic of agricultural uses with one-off housing in ribbon development patterns, which includes extension of existing dwellings and up-grading of domestic waste water treatment systems.

The Hydrogeological and Hydrological Assessment (included in the Environmental Statement Part 3 as Appendix 6.1) details that the outflow from Tromman quarry is directed into the Knightsbrook stream. The stretch of the Knightsbrook stream that the site flows into (Knightsbrook_020) is characterised as 'Good Status' under the Water Framework Directive Monitoring (2010-2015). The status of this stream changes to 'Poor' downstream of the R159 where other inflow streams join it from the east. This appears to demonstrate that, although there is a negative impact on the River Boyne (Boyne_100 waterbody, which is classified as 'Moderate') from the inflowing Knightsbrook stream, that this does not arise from the waterbody that the quarry connects to, which is in a higher status than all the downstream river waterbodies.

In addition, the The Hydrogeological and Hydrological Assessment (see Tromman Quarry EIS August 2019), states that water samples have been collected from the quarry discharge point on a regular basis and submitted for laboratory analysis in order to demonstrate compliance with the limits specified in the discharge consent (Trade Effluent Discharge Licence Ref. 04/2) and that this has not been breached.

There are no other issues that are considered to be relevant with respect to potential in-combination impacts for this site.

6 MITIGATION

The following mitigation measures are considered:

- All surface runoff within the site is collected and processed through settlement tanks prior to controlled discharge via the consented discharge point.
- The existing water treatment approaches employed by the quarry including a hydrocarbon interceptor, three-stage settlement tanks and a discharge volume limit. The discharge into a ditch in the northeast corner is covered by Trade Effluent Discharge Licence Ref. 04/2 (see EMS).
- Water samples have been collected from the discharge point on a regular basis and submitted for laboratory analysis in order to demonstrate compliance with the limits specified in the consent.
- EPA monitoring of the Knightsbrook stream gives the water quality status as Good.

There are control measures already in place to mitigate against contamination of surface waters including the construction of a surface water and ground water management system in 2009 - see Environmental Management System (EMS - Byrne Environmental 2009, updated August 2019). In relation to protecting surface waters within the Keegan Quarry site as a whole, the EMS (Byrne Environmental 2019) states:

The following general guidelines have been considered in designing an effective surface water management system for the site.

- *Solid inert waste will be disposed of by licensed removal from the site or by recycling on the site in a designated inert waste recycling location and in a manner that will not impact on surface waters.*
- *Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment in the designated storage location. Drip trays, mobile bunds and permanent bunded areas will be installed to minimize the potential for pollution of surface water bodies.*
- *Fuelling and lubrication of vehicles and mobile plant and equipment will not be carried out close to water courses and will be conducted on concrete surfaced areas.*
- *All refill points for fuels, lubricants, hydraulic fluids or any other hydro-carbon based liquids will be located in a hardstanding bunded area.*
- *Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and any contaminated soil removed from the site and properly disposed of by an appropriately licensed contractor.*
- *Foul drainage from site offices, canteen and toilets will be discharged to the biocycle system and percolation area.*
- *All concreted surfaces used for refuelling will be drained to a petrol/oil interceptor unit.*
- *Sites for use as storage areas, machinery depots, site offices, internal haul roads or the disposal of spoil will be located as far as is practicable from watercourses.*
- *All surface water collected on-site shall be diverted to the surface water settlement pond prior to discharge via a petrol/oil interceptor to surface water.*
- *No water shall be pumped from the quarry without passing through the settlement pond system.*
- *The settlement lagoons shall be inspected weekly by the Site Manager and all settled solids shall be removed by pumping as required to ensure the capacity and efficiency of the lagoons is maintained at all times.*
- *Absorbent materials such as absorbent booms and vermiculite will be held on site and any spillages of organic liquids such as oils, greases etc will be contained and cleaned up immediately. The contaminated absorbent material will be correctly stored in a designated area on-site prior to being collected and disposed of by an approved contractor.*
- *All accidental discharge incidents shall be immediately reported to the environment department of Meath County Council by the Quarry Manager.*

On the basis that the mitigation measures outlined in the EMS are in place, and all surface runoff is collected in the settlement tanks for discharge via the consented discharge point (as covered by Trade Effluent Discharge Licence Ref. 04/2), the risk of local watercourses and ground waters becoming contaminated as a result of further quarrying operations is considered to be low. It is considered that existing measures, in combination with the distance between the development and the downstream Natura 2000 sites, are sufficient to ensure protection of the downstream SAC and SPA from any level of impact, as demonstrated by the monitoring data. It is therefore

concluded that the Proposed Development will not have the potential to impact on the features of the SAC or SPA.

7 CONCLUSIONS

This Natura Impact Statement has identified the particular types of effect that have potential for adverse impact on the integrity of the River Boyne and Blackwater SAC and the River Boyne and Blackwater SPA. The statement identifies mitigation measures that will ensure avoidance of these effects; so that the structure and functions of the SAC and SPA are not affected, thus demonstrating that mitigation will be sufficient to avoid adverse impact due to the proposed development assessed. These mitigation measures are set out in Section 6. The implementation of these control measures on site means that it can be concluded in the light of best scientific knowledge, that there will be no significant effects, either individually or in combination with other plans or projects, adversely affecting the conservation interests or conservation objectives of the River Boyne and Blackwater SAC and the River Boyne and Blackwater SPA, i.e. the integrity of these, or any other Natura 2000 sites. It is therefore concluded that the proposal will not, beyond reasonable scientific doubt, adversely affect the integrity of any European Site (Natura 2000 site) either directly or indirectly.

This has been concluded for the following reasons:

- Limited connectivity to any Natura 2000 Site (a linear hydrological connection of 10 km to the River Boyne and Blackwater SAC and River Boyne and Blackwater SPA via a drain that largely only takes dewatering arisings from the quarry);
- The contained nature of quarrying and manufacturing operations with the site;
- Environmental controls employed, including an on-site Environmental Management System.

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9 APPENDIX 1: SITE SYNOPSIS – RIVER BOYNE AND RIVER BLACKWATER SAC



SITE SYNOPSIS

Site Name: River Boyne and River Blackwater SAC

Site Code: 002299

This site comprises the freshwater element of the River Boyne as far as the Boyne Aqueduct, the Blackwater as far as Lough Ramor and the Boyne tributaries including the Deel, Stoneyford and Tremblestown Rivers. These riverine stretches drain a considerable area of Meath and Westmeath, and smaller areas of Cavan and Louth. The underlying geology is Carboniferous Limestone for the most part, with areas of Upper, Lower and Middle well represented. In the vicinity of Kells Silurian Quartzite is present while close to Trim are Carboniferous Shales and Sandstones. There are many large towns adjacent to but not within the site, including Slane, Navan, Kells, Trim, Athboy and Ballivor.

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

[7230] Alkaline Fens
[91E0] Alluvial Forests*
[1099] River Lamprey (<i>Lampetra fluviatilis</i>)
[1106] Atlantic Salmon (<i>Salmo salar</i>)
[1355] Otter (<i>Lutra lutra</i>)

The main areas of alkaline fen in this site are concentrated in the vicinity of Lough Shesk, Freehan Lough and Newtown Lough. The hummocky nature of the local terrain produces frequent springs and seepages which are rich in lime. A series of base-rich marshes have developed in the poorly-drained hollows, generally linked with these three lakes. Open water is usually fringed by Bulrush (*Typha latifolia*), Common Club-rush (*Scirpus lacustris*) or Common Reed (*Phragmites australis*), and this last species also extends shorewards where a dense stand of Great Fen-sedge (*Cladium mariscus*) frequently occurs. This in turn grades into a sedge and grass community (*Carex* spp. and Purple Moor-grass, *Molinia caerulea*), or one dominated by Black Bog-rush (*Schoenus nigricans*). An alternative aquatic/terrestrial transition is a floating layer of vegetation. This is normally based on Bogbean (*Menyanthes trifoliata*) and Marsh Cinquefoil (*Potentilla palustris*). Other species gradually become established on this cover, especially plants tolerant of low nutrient status e.g. bog mosses (*Sphagnum* spp.). Diversity of plant and animal life is high in the fen and the flora includes many rarities. Plants of interest include Narrow-leaved Marsh-orchid (*Dactylorhiza traunsteineri*), Fen Bedstraw (*Galium uliginosum*), Cowbane (*Cicuta virosa*), Frogbit (*Hydrocharis morsus-ranae*) and Least Bur-reed (*Sparganium minimum*). These species tend to be restricted in their distribution in Ireland. Also notable is the

abundance of aquatic stoneworts (*Chara* spp.) which are characteristic of calcareous wetlands.

The rare plant Round-leaved Wintergreen (*Pyrola rotundifolia*) occurs around Newtown Lough. This species is listed in the Red Data Book and this site represents its only occurrence in Co. Meath.

Wet woodland fringes many stretches of the Boyne. The Boyne River Islands are a small chain of three islands situated 2.5 km west of Drogheda. The islands were formed by the build-up of alluvial sediment in this part of the river where water movement is sluggish. All of the islands are covered by dense thickets of wet, willow (*Salix* spp.) woodland, with the following species occurring: Osier (*S. viminalis*), Crack Willow (*S. fragilis*), White Willow (*S. alba*), Purple Willow (*Salix purpurea*) and Rusty Willow (*S. cinerea* subsp. *oleifolia*). A small area of Alder (*Alnus glutinosa*) woodland is found on soft ground at the edge of the canal in the north-western section of the islands. Along other stretches of the rivers of the site Rusty Willow scrub and pockets of wet woodland dominated by Alder have become established, particularly at the river edge of mature deciduous woodland. Ash (*Fraxinus excelsior*) and Downy Birch (*Betula pubescens*) are common in the latter, and the ground flora is typical of wet woodland with Meadowsweet (*Filipendula ulmaria*), Wild Angelica (*Angelica sylvestris*), Yellow Iris (*Iris pseudacorus*), horsetails (*Equisetum* spp.) and occasional tussocks of Greater Tussock-sedge (*Carex paniculata*).

The dominant habitat along the edges of the river is freshwater marsh, and the following plant species occur commonly in these areas: Yellow Iris, Creeping Bent (*Agrostis stolonifera*), Canary Reed-grass (*Phalaris arundinacea*), Marsh Bedstraw (*Galium palustre*), Water Mint (*Mentha aquatica*) and Water Forget-me-not (*Myosotis scorpioides*). In the wetter areas Common Meadow-rue (*Thalictrum flavum*) is found. In the vicinity of Dowth, Fen Bedstraw (*Galium uliginosum*), a scarce species mainly confined to marshy areas in the midlands, is common in this vegetation. Swamp Meadow-grass (*Poa palustris*) is an introduced plant which has spread into the wild (naturalised) along the Boyne approximately 5 km south-west of Slane. It is a rare species which is listed in the Red Data Book and has been recorded among freshwater marsh vegetation on the banks of the Boyne in this site. The only other record for this species in the Republic of Ireland is from a site in Co. Monaghan.

The secondary habitat associated with the marsh is wet grassland and species such as Tall Fescue (*Festuca arundinacea*), Silverweed (*Potentilla anserina*), Creeping Buttercup (*Ranunculus repens*), Meadowsweet and Meadow Vetchling (*Lathyrus pratensis*) are well represented. Strawberry Clover (*Trifolium fragiferum*), a plant generally restricted to coastal locations in Ireland, has been recorded from wet grassland vegetation at Trim. At Rossnaree river bank on the River Boyne, Round-Fruited Rush (*Juncus compressus*) is found in alluvial pasture, which is generally periodically flooded during the winter months. This rare plant is only found in three counties in Ireland.

Along much of the Boyne and along tributary stretches are found areas of mature deciduous woodland on the steeper slopes above the floodplain marsh or wet woodland vegetation. Many of these are planted in origin. However the steeper areas of King Williams Glen and Townley Hall wood have been left unmanaged and now have a more natural character. East of Curley Hole the woodland has a natural appearance with few conifers. Broadleaved species include oaks (*Quercus* spp.), Ash, willows, Hazel (*Corylus avellana*), Sycamore (*Acer pseudoplatanus*), Holly (*Ilex aquifolium*), Horse-chestnut (*Aesculus hippocastanum*) and the shrubs Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*) and Elder (*Sambucus nigra*). South-west of Slane and in Dowth, some more exotic tree species such as Beech (*Fagus sylvatica*), and occasionally Lime (*Tilia cordata*), are seen. The coniferous trees Larch (*Larix* sp.) and Scots Pine (*Pinus sylvestris*) also occur. The woodland ground flora includes Barren Strawberry (*Potentilla sterilis*), Enchanter's-nightshade (*Circaea lutetiana*) and Ground-ivy (*Glechoma hederacea*), along with a range of ferns. Variation occurs in the composition of the canopy - for example, in wet patches alongside the river, White Willow and Alder form the canopy.

Other habitats present along the Boyne and Blackwater include lowland dry grassland, improved grassland, reedswamp, weedy waste ground, scrub, hedge, drainage ditch and canal. In the vicinity of Lough Shesk, the dry slopes of the morainic hummocks support grassland vegetation which, in some places, is partially colonised by Gorse (*Ulex europaeus*) scrub. Those grasslands which remain unimproved for pasture are species-rich, with Common Knapweed (*Centaurea nigra*), Creeping Thistle (*Cirsium arvense*) and Ribwort Plantain (*Plantago lanceolata*) commonly present. Fringing the canal alongside the Boyne south-west of Slane are areas with Reed Sweet-grass (*Glyceria maxima*), Great Willowherb (*Epilobium hirsutum*) and Meadowsweet.

The Boyne and its tributaries form one of Ireland's premier game fisheries and the area offers a wide range of angling, from fishing for spring salmon and grilse to seatrout fishing and extensive brown trout fishing. Atlantic Salmon (*Salmo salar*) use the tributaries and headwaters as spawning grounds. Although this species is still fished commercially in Ireland, it is considered to be endangered or locally threatened elsewhere in Europe and is listed on Annex II of the Habitats Directive. Atlantic Salmon run the Boyne almost every month of the year. The Boyne is most important as it represents an eastern river which holds large three-sea-winter fish from 20-30 lb. These fish generally arrive in February, with smaller spring fish (10 lb) arriving in April/May. The grilse come in July, water permitting. The river gets a further run of fish in late August and this run would appear to last well after the fishing season. The salmon fishing season lasts from 1st March to 30th September.

The Blackwater is a medium sized limestone river which is still recovering from the effects of the arterial drainage scheme of the 1970s. Salmon stocks have not recovered to the numbers that existed pre-drainage. The Deel, Riverstown, Stoneyford and Tremblestown Rivers are all spring-fed, with a continuous high volume of water. They are difficult to fish because some areas are overgrown, while others have been affected by drainage with resultant high banks.

This site is also important for the populations of two other species listed on Annex II of the E.U. Habitats Directive which it supports, namely River Lamprey (*Lampetra fluviatilis*), which is present in the lower reaches of the Boyne River, and Otter (*Lutra lutra*), which can be found throughout the site. In addition, the site also supports many more of the mammal species occurring in Ireland. Those which are listed in the Irish Red Data Book include Pine Marten, Badger and Irish Hare. Common Frog, another Red Data Book species, also occurs within the site. All of these animals, with the addition of the Stoat and Red Squirrel, which also occur within the site, are protected under the Wildlife Act, 1976.

Whooper Swans winter regularly at several locations along the Boyne and Blackwater Rivers. Known sites are at Newgrange (approx. 20 in recent winters), near Slane (20+ in recent winters), Wilkinstown (several records of 100+) and River Blackwater from Kells to Navan (104 at Kells in winter 1996/97, 182 at Headfort in winter 1997/98, 200-300 in winter 1999/00). The available information indicates that there is a regular wintering population of Whooper Swans based along the Boyne and Blackwater River valleys. The birds use a range of feeding sites but roosting sites are not well known. The population is substantial, certainly of national, and at times international, importance. Numbers are probably in the low hundreds.

Intensive agriculture is the main land use along the site. Much of the grassland is in very large fields and is improved. Silage harvesting is carried out. The spreading of slurry and fertiliser poses a threat to the water quality of this salmonid river and to the lakes. In the more extensive agricultural areas sheep grazing is carried out.

Fishing is a main tourist attraction on the Boyne and Blackwater and there are a number of Angler Associations, some with a number of beats. Fishing stands and styles have been erected in places. The Eastern Regional Fishery Board have erected fencing along selected stretches of the river as part of their salmonid enhancement programme. Parts of the river system have been arterially dredged. In 1969 an arterial dredging scheme commenced and disrupted angling for 18 years. The dredging altered the character of the river completely and resulted in many areas in very high banks. The main channel from Drogheda upstream to Navan was left untouched, as were a few stretches on the Blackwater. Ongoing maintenance dredging is carried out along stretches of the river system where the gradient is low. This is extremely destructive to salmonid habitat in the area. Drainage of the adjacent river systems also impacts on the many small wetland areas throughout the site. The River Boyne is a designated Salmonid Water under the E.U. Freshwater Fish Directive.

The site supports populations of several species listed on Annex II of the E.U. Habitats Directive, and habitats listed on Annex I of this Directive, as well as examples of other important habitat types. Although the wet woodland areas appear small there are few similar examples of this type of alluvial wet woodland remaining in the country, particularly in the north-east. The semi-natural habitats, particularly the strips of woodland which extend along the river banks, and the marsh and wet grasslands, increase the overall habitat diversity and add to the ecological value of the site, as does the presence of a range of Red Data Book plant and animal species and the presence of nationally rare plant species.

10 APPENDIX 2: SITE SYNOPSIS – RIVER BOYNE AND RIVER BLACKWATER SPA

SITE SYNOPSIS

SITE NAME: RIVER BOYNE AND RIVER BLACKWATER SPA

SITE CODE: 004232

The River Boyne and River Blackwater SPA is a long, linear site that comprises stretches of the River Boyne and several of its tributaries; most of the site is in Co. Meath, but it extends also into Cos Cavan, Louth and Westmeath. It includes the following river sections: the River Boyne from the M1 motorway bridge, west of Drogheda, to the junction with the Royal Canal, west of Longwood, Co Meath; the River Blackwater from its junction with the River Boyne in Navan to the junction with Lough Ramor in Co. Cavan; the Tremblestown River/Athboy River from the junction with the River Boyne at Kilnagross Bridge west of Trim to the bridge in Athboy, Co. Meath; the Stoneyford River from its junction with the River Boyne to Stonestown Bridge in Co. Westmeath; the River Deel from its junction with the River Boyne to Cummer Bridge, Co. Westmeath. The site includes the river channel and marginal vegetation.

Most of the site is underlain by Carboniferous limestone but Silurian quartzite also occurs in the vicinity of Kells and Carboniferous shales and sandstones close to Trim.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive of special conservation interest for the following species: Kingfisher.

A survey in 2010 recorded 19 pairs of Kingfisher (based on 15 probable and 4 possible territories) in the River Boyne and River Blackwater SPA. A survey conducted in 2008 recorded 20-22 Kingfisher territories within the SPA. Other species which occur within the site include Mute Swan (90), Teal (166), Mallard (219), Cormorant (36), Grey Heron (44), Moorhen (84), Snipe (32) and Sand Martin (553) – all figures are peak counts recorded during the 2010 survey.

The River Boyne and River Blackwater Special Protection Area is of high ornithological importance as it supports a nationally important population of Kingfisher, a species that is listed on Annex I of the E.U. Birds Directive.

25.11.2010