

# NATURA IMPACT STATEMENT

**Air Emissions Licence for Permitted Asphalt Plant  
at Clasheen Townland, Killarney**

**Co. Kerry**

**(Kerry Co. Council Ref. AP20-01; EPA Reg. No.  
E0010-01)**

Prepared for: Roadstone Ltd.

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### APPENDIX A

Envirocon (2021): Application for an Air Emissions Licence (AP-20-01): Request for Clarification of Further Information) Proposed Asphalt Plant, Roadstone Ltd., Clasheen, Killarney, Co Kerry

### APPENDIX B

Envirocon (2022): EPA Air Emissions Licence Appeal (AP-20-01): Addendum Report Relating to Appropriate Assessment Notice for Operation of Asphalt Plant Roadstone Ltd. Clasheen, Killarney, Co. Kerry

## 1.0 Introduction

SLR Consulting Ireland (SLR) was commissioned by Roadstone Ltd. (Roadstone) to prepare a Stage 2 Appropriate Assessment Natura Impact Statement in support of the application to the Environmental Protection Agency (EPA) for an air emissions licence for a permitted asphalt plant at Clasheen Townland, Killarney, Co. Kerry. This submission is made without prejudice to any previous submissions in relation to this application.

### 1.1 Background

Planning permission for the installation of a mobile blacktop plant at the existing Roadstone sand and gravel pit was granted by Kerry County Council in February 2011 (Plan File Ref. No. 10/1163). An extension of duration of the planning permission, under Section 42 of the Planning and Development Act 2000 (as amended), was granted by Kerry County Council on the 16 May 2016 (Plan File Ref. No. 10/91163). The plant was subsequently constructed.

An air emissions licence was granted for the permitted mobile blacktop plant by Kerry County Council on the 22 February 2011 (Ref. No. AP10-01). A first party appeal was made to An Bord Pleanála to amend a condition of the licence and An Bord Pleanála made a decision on the 29 July 2011 to grant the licence. On the 21 December 2018 Kerry County Council environment section wrote to the applicant informing them that as no atmospheric emissions had occurred to date at the site, the licence would cease to have effect. As a result, there is now a requirement for a new air emission licence for the permitted asphalt plant.

An AA screening exercise was undertaken as part of the planning application for the extension of the mobile asphalt plant (Plan File Ref. 10/91163), which concluded that there was no potential for significant effects on Natura 2000 sites.

A new air emissions licence application was then made by SLR, on behalf of the applicant, Roadstone, to Kerry County Council (Environmental Services) in October 2020 (Ref. No. AP-20-01). The following request for further information was made by Kerry County Council in December 2020, under the Air Pollution Act, 1987 (Licensing of Industrial Plant) Regulations, 1988:

*"7. You are requested to submit an AA Screening Report ruling out the potential for significant effect on Natura 2000 sites with certainty and without the use of mitigation measures or alternatively you are requested to submit a Natura Impact Statement for the proposal. As part of this, particular regard should be given to the vulnerability of Sheheree (Ardagh) Bog SAC to emissions as set out in the Conservation Objectives for the Natura 2000 Site. Regard should also be given to potential for cumulative effects taking into consideration existing and permitted developments in the area."*

Consequently, an Appropriate Assessment Screening report to support the application for an Air Emissions Licence was prepared by SLR in February 2021 which concluded that *'based on the available information and project details, it was demonstrated that the proposed project does not pose a risk of likely significant effects on Natura 2000 sites'*, and a Notification of Decision to grant a licence was issued by Kerry County Council on 21<sup>st</sup> May 2021 (Ref. No. AP-20-01).

However, third party appeals were made to the Environmental Protection Agency (EPA) against the decision made by Kerry County Council to grant a licence (Ref. No. AP-20-01) under the Air Pollution Act 1987, as amended, for the operation of the asphalt plant at Clasheen, Killarney. As part of their consideration of these appeals, the EPA carried out its own Appropriate Assessment Screening, and on the 7<sup>th</sup> April 2022 issued a determination that an Appropriate Assessment (Stage 2 NIS) is required. The EPA issued an updated determination on the 5<sup>th</sup> May 2022 confirming that an Appropriate Assessment (Stage 2 NIS) is required.

This document is the Appropriate Assessment and Natura Impact Statement which provides the necessary information for the EPA to carry out a Stage 2 Appropriate Assessment for the air emissions licence application.

## 1.2 General Description of the Site

The proposed location of the new asphalt plant ("the Site") is within Roadstone's existing sand and gravel pit at Clasheen Townland, near Minish, approximately 3 km southeast of Killarney, Co. Kerry. The Site is centred at approximate Ordnance Survey Ireland Grid Reference (OSIGR) coordinates W 01471 88822.

The Site is accessed directly from the N22 national road that runs between Killarney and Cork. The existing entrance area of the pit extends eastwards from the N22 road for 1 km with the proposed asphalt plant site on the pit floor within the eastern section of the active extraction area. The width of the pit floor near the proposed asphalt plant site is about 150m from north to south with the faces extending 8-10m above the floor on both sides.

The surrounding topography is gently undulating within 3 km of the site with elevations of 50-80 m O.D. within 3 km to the west of the N22. At the eastern end of the pit the ground surface is at about 90 m O.D. with the terrain increasing to 120-150 m O.D. within 4 km north of the eastern boundary.

The land use in the surrounding area is mainly fields for arable farming and pasture land with isolated areas of bog land. There is an extensive area of mature woodland along the north-eastern boundary and extending along the eastern end of the pit.

## 1.3 Purpose of Report

The purpose of this report is to provide supporting information to assist the competent authority, in this case the EPA, to carry out an Appropriate Assessment for adverse effects on the integrity of Natura 2000 sites resulting from the air emissions for the permitted asphalt plant at Clasheen Townland, Killarney, Co. Kerry.

## 1.4 Evidence of Technical Competence and Experience

SLR Associate Ecologist Michael Bailey prepared this report and SLR Technical Director Richard Arnold carried out the technical review.

Michael Bailey holds a BSc. in Biology and Ecology from the University of Ulster and an MSc. in Quantitative Conservation Biology from the University of the Witwatersrand in Johannesburg. He has extensive experience in ecological studies and assessments across a range of sectors in Ireland and of agricultural, mining, and renewable energy projects across Africa. He is a member of the Chartered Institute of Ecology and Environmental Management (MCIEEM).

Richard Arnold BSc MRes MCIEEM CEnv. Richard has 24 years of experience as a consultant ecologist, which has included preparing and overseeing assessments under the Habitats Regulations/Directive for multiple projects, including small and large infrastructure projects. Richard Arnold is a Technical Director at SLR Consulting Ltd.

## 1.5 Relevant Legislation

### 1.5.1 European Nature Directives (Habitats and Birds)

The Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) forms the basis for the designation of Special Areas of Conservation (SAC). Similarly, Special Protection Areas (SPA) are classified under the Birds Directive (Council Directive 2009/147/EEC on the Conservation of Wild Birds). Collectively, SACs and SPAs are referred to as the Natura 2000 network. The Natura 2000 Network is the minimum required to conserve certain habitats and species which are listed in the Directives.

Under Article 6(3) of the Habitats Directive, an Appropriate Assessment (AA) must be undertaken for any plan or project that is not directly connected with or necessary to the management of a Natura 2000 site but is likely to have a significant effect thereon, either individually or in combination with other plans or projects. An AA is an

evaluation of the potential impacts of a plan or project on the conservation objectives of a Natura 2000 site, and the identification, where necessary, of mitigation or avoidance measures to preclude adverse effects on the integrity of the site.

Article 6, paragraph 3 of the European Commission Habitats Directive 92/43/EEC ("the Habitats Directive") states that:

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

### 1.5.2 European Communities (Birds and Natural Habitats) Regulations 2011

Pursuant to the Habitats Directive, Part 5 of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended, similarly sets out the requirements for screening assessments and the circumstances under which an AA is required.

Regulation 42(1) 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 European 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 European site.'* Regulation 42(2) expands on this, stipulating that a public authority must carry out a screening for AA before consent for a plan or project is given, or a decision to undertake or adopt a plan or project is taken.

Regulation 42(6) requires that *'the public authority shall determine that an Appropriate Assessment of a plan or project is required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it cannot be excluded, on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site'.*

Regulation 42(3)(a) gives the public authority the power to direct a third party to provide a Natura Impact Statement (NIS) and Regulation 42(3)(b) allows it to request any additional information that it needs to complete the screening assessment or AA. Regulation 42(5) goes on to make clear that the NIS should include such information as the public authority considers necessary to enable it to undertake the AA and to ascertain if a project or plan will affect the integrity of a Natura 2000 site. In addition to the information, Regulation 2(1) provides a definition of a Natura Impact Statement as *'a report comprising the scientific examination of a plan or project and the relevant European Site or European Sites, to identify and characterise any possible implications of the plan or project individually or in combination with other plans or projects in view of the conservation objectives of the site or sites, and any further information including, but not limited to, any plans, maps or drawings, scientific information or data required to enable the carrying out of an Appropriate Assessment'.*

Regulation 42(11) makes clear that the AA must be carried out by the public authority and that it must include its conclusion as to whether the project or plan would adversely affect the integrity of a Natura 2000 site, and that this must be done prior to consenting the project.

### 1.5.3 Planning and Development Act 2000 (as amended)

These processes have been further enshrined in the Planning and Development Act 2000 (as amended), in sections 177T, 177U and 177V, which are as follows:



*s177T(1)(b) A Natura impact statement means a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a proposed development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites.*

*(2) Without prejudice to the generality of subsection (1), a Natura impact report or a Natura impact statement, as the case may be, shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites.*

*177U. — (1) A screening for appropriate assessment of a draft Land use plan or application for consent for proposed development shall be carried out by the competent authority to assess, in view of best scientific knowledge, if that Land use plan or proposed development, individually or in combination with another plan or project is likely to have a significant effect on the European site.*

*(4) The competent authority shall determine that an appropriate assessment of a draft Land use plan or a proposed development, as the case may be, is required if it cannot be excluded, on the basis of objective information, that the draft Land use plan or proposed development, individually or in combination with other plans or projects, will have a significant effect on a European site.*

*177V. — (1) An appropriate assessment carried out under this Part shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a draft Land use plan or proposed development would adversely affect the integrity of a European site and an appropriate assessment shall be carried out by the competent authority, in each case where it has made a determination under section 177U(4) that an appropriate assessment is required, before — ... ( b ) consent is given for the proposed development.*

## 1.6 Methodology

### 1.6.1 General Approach

The methodology used in this report is based on guidance provided by the National Parks and Wildlife Service (NPWS, 2010), the Office of the Planning Regulator (OPR, 2021) and EC Guidance (EC, 2018) (EC, 2020) (EC, 2021) on the application of Article 6 of the Habitats Directive. The 2021 EC guidance describes a series of stages and steps which should be completed when carrying out the assessment and these are followed here with minor modifications. The assessment applies only to Natura 2000 sites (SPAs and SACs). More specifically, it only applies to the qualifying interest features of such sites i.e. the features which are the reason that the site was designated.

### 1.6.2 Stage One: Screening

Stage One is a screening assessment, the purpose of which is to determine whether a plan or project requires more detailed assessment. There are two principal tests. The first considers whether the plan or project is needed for the management of a European site for the purpose of maintaining or restoring its conservation interest. Any such plans or projects can usually be screened out of further assessment. The second test considers whether the plan or project, without specific mitigation measures, would be likely to have a significant effect on any European Site. This requires consideration of the project on its own and in combination with other plans or projects. A project can only be screened out of further assessment if it is certain (beyond reasonable scientific doubt and on the basis of the best scientific knowledge) that there would be no significant effects on any Natura 2000 site without mitigation designed specifically to address potential impacts on the qualifying interest of such sites. Significant effects in this assessment are those which could undermine the conservation objectives of a qualifying interest feature. The process is used to determine which Natura 2000 Sites should be included in the later stages of the assessment. It can also be used to determine which qualifying interest features require further assessment.



### 1.6.3 Stage Two: Appropriate Assessment

Stage Two is a more detailed assessment, known as an “Appropriate Assessment” due to the terminology in the legislation. This essentially repeats the second test of the screening assessment but in more detail and considering mitigation measures before reaching a conclusion. At this stage, the test is whether the project or plan will have an adverse effect on the integrity of any European site. This must be done in the light of the conservation objectives for each of the sites and qualifying interest features that have been ‘screened in’ by the earlier stage of assessment. Any effect which could undermine the conservation objectives is considered an adverse effect on the integrity of the site, and vice versa. If the project is predicted to lead to adverse effects upon the integrity of the site, further stages of assessment are required before the project can be authorised.

### 1.6.4 Sources of Information

Sources of information for the assessment of the Project ‘*alone*’ include:

- Article 17 and Article 12 reports completed by the National Parks and Wildlife Service<sup>1</sup>;
- Site Synopses, Conservation Objectives and Standard Data Forms for the Natura 2000 sites<sup>2</sup>;
- Appropriate Assessment Screening Report for the Application for Air Emissions Licence prepared by SLR in February 2021.
- Application for an Air Emissions Licence (AP-20-01: Request for Clarification of Further Information) prepared by Envirocon March 2021 which included air emissions modelling.
- Envirocon (2022): EPA Air Emissions Licence Appeal (AP-20-01): Addendum Report Relating to Appropriate Assessment Notice for Operation of Asphalt Plant Roadstone Ltd. Clasheen, Killarney, Co. Kerry which includes revised air emission modelling as per the conditions issued in the Notification of Decision to Grant a Licence issued by Kerry County Council (Ref. No. AP-20-01).
- Notification of Decision to Grant a licence issued by Kerry County Council on 21st May 2021 (Ref. No. AP-20-01).
- European Union Ambient Air Quality Standards (Based on Directive 2008/50/EC) Critical Levels as limit values for the protection of vegetation and ecosystems.
- Environmental Protection Agency Office of Environmental Enforcement (OEE), Air Dispersion Modelling from Industrial Installations Guidance Note (AG4) Critical Levels as limit values for the protection of vegetation and ecosystems.
- IAQM (2020). A Guide to the assessment of air quality impacts on designated nature conservation sites; Institute of Air Quality Management
- Environmental Protection Agency (EPA) Maps<sup>3</sup>.
- Killarney National Park and Macgillicuddy’s Reeks and Caragh Rice Catchment SAC (000365): Conservation Objectives supporting documents – blanket bogs and associated habitats.
- Sheheree (Ardagh) Bog SAC (000382): Conservation Objectives supporting document – raised bog habitats.
- Killarney National Park SPA [004038]: Conservation Objectives supporting document- Merlin (*Falco columbarius*) and Greenland White-fronted Goose (*Answer albifrons flavirostris*)
- Relevant information on the planning file for the asphalt plant planning applications (Plan File Ref. No. 10/1163 and 10/91163) was also reviewed.

Sources of information for the plans and projects for the ‘*in combination*’ assessment were as above and also include:

<sup>1</sup> <https://www.npws.ie/publications/article-17-reports?msclid=0c19d260b00a11ecaf5a935da63f219b> (last accessed 03 May 2022)

<sup>2</sup> <https://www.npws.ie/protected-sites> (last accessed 03 May 2022)

<sup>3</sup> <http://gis.epa.ie/> (last accessed 03 May 2022)

- Kerry County Development Plan 2015 – 2021.
- Kerry County Council planning portal<sup>4</sup> and myplan.ie<sup>5</sup> were accessed for information on other projects and plans.

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<sup>4</sup> <https://www.kerrycoco.ie/planning/> (last accessed 03 May 2022)

<sup>5</sup> <https://myplan.ie/> (last accessed 03 May 2022)

## 2.0 Stage 1: Screening

### 2.1 Step 1: Management of Natura 2000 Sites

The Project is the air emissions from the operation of a permitted mobile asphalt plant at an existing operational sand and gravel pit. Therefore, it is not connected with, or necessary for, the management of a Natura 2000 site.

### 2.2 Step 2, Part 1: Brief Project Description

Roadstone are proposing to operate an asphalt plant at their operational sand and gravel pit. The permitted asphalt plant is a mobile blacktop plant, as per the details set out in the existing planning permission (Plan Ref. No. 10/1163).

The permitted asphalt plant is a mobile blacktop plant which is a batch-mix operation and comprises a single exhaust stack, industry approved dust emissions control system, aggregate feed bins, aggregate dryer, bitumen mixing hopper with storage silos and hot storage bins with direct discharge of hot mix. The principal emissions from the exhaust stack are oxides of nitrogen (NO<sub>x</sub>), sulphur dioxide (SO<sub>2</sub>), particulates and other products of combustion from the production process.

### 2.3 Step 2, Part 2: Potential Impact Factors

One potential source of impact has been identified as a result of the operation of the project, namely:

- Air quality impacts on sensitive vegetation resulting from the asphalt plant air emissions, particularly NO<sub>x</sub> and SO<sub>2</sub>.

### 2.4 Step 3: Identification of Natura 2000 Sites

During the Appropriate Assessment Screening conducted by the EPA in their determinations dated 6<sup>th</sup> April and 5<sup>th</sup> May 2022, the following Natura 2000 (referred to as “European Sites” by the EPA) were assessed as requiring stage 2 Appropriate Assessment:

- Killarney National Park, Macgillicuddy’s Reeks and Caragh River Catchment SAC [000365]
- Sheheree (Ardagh) Bog SAC [000382], and
- Killarney National Park SPA [004038]

These three sites were considered by the EPA to be within the zone of influence of the project and therefore they are also considered in this Natura Impact Statement.

The closest Natura 2000 site is the Killarney National Park, Macgillicuddy’s Reeks and Caragh River Catchment SAC [000365]. The River Flesk, which forms part of this SAC, flows northwards to the south and the west of the Roadstone pit and passes within 0.63 km to the south and 1.5 km to the west of the asphalt plant site. The second closest site is Sheheree (Ardagh) Bog SAC [000382] situated 2.9 km to the west of the asphalt plant site, and the third closest is Killarney National Park SPA [004038] located 3.5 km to the west of the asphalt plant site. These three Natura 2000 sites are close enough to the Site that they can be considered to be within the zone of influence of the project. They are shown on Figure 1 and described in Table 2.1.

Castlemaine Harbour SAC 000343 lies approximately 8.3 km to the northwest; Old Domestic Building, Curraglass Wood SAC 0002041 9.7 km to the south; and Blackwater River (Cork/Waterford) SAC 002170 lies 12.4 km to the northeast of the Site (Figure 1). As with the EPA AA Screening, it is considered that all three of these Natura 2000 sites are sufficiently distant from the asphalt plant that any air emissions will not affect them.

All other Natura 2000 sites are also considered to be outside the zone of influence of the project as they are sufficiently distant from the asphalt plant and are not likely to be affected by emissions to air (NO<sub>x</sub> and SO<sub>2</sub>).

**Table 2.1: Designated Sites within zone of influence of the project**

Natura 2000 Site Name and Code	Distance <sup>6</sup>	Qualifying Interests <sup>7</sup>	Brief Description	Connections (Source-Pathway-Receptor)
Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC [000365]	0.63 km	<ul style="list-style-type: none"> <li>Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110]</li> <li>Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130]</li> <li>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260]</li> <li>Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010]</li> <li>European dry heaths [4030]</li> <li>Alpine and Boreal heaths [4060]</li> <li><i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130]</li> <li>Calaminarian grasslands of the <i>Violetalia calaminariae</i> [6130]</li> <li>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410]</li> <li>Blanket bogs (* if active bog) [7130]</li> <li>Depressions on peat substrates of the Rhynchosporion [7150]</li> </ul>	<i>This is the largest terrestrial SAC in Ireland at 76445 ha. It is the most mountainous region of Ireland and glacial processes have shaped the sandstone into dramatic ridges and valleys, including the well wooded Killarney valley. A wide range of semi-natural habitats are present, along with some improved land and forestry in the Caragh River catchment. Generally, the proximity of the site to the Atlantic in the south-west ensures a strong oceanic influence. This site is of great ecological importance. It includes the most extensive oakwoods in the country, with some of the best bryophyte communities in Europe; Ireland's only sizable stand of Yew; excellent examples of blanket bog, alluvial woodland; good quality oligotrophic lakes, some of which support rare glacial relicts; unpolluted rivers with aquatic vegetation and rare invertebrates and fish; and several other annexed habitats. The site also</i>	There are Air Emissions (NO <sub>x</sub> and SO <sub>2</sub> from the asphalt plant) [Source] – Ecological Atmospheric (Dispersal by easterly winds) [Pathway] – Sensitive Vegetation (potential negative changes in vegetation composition due to nutrient (N) increase and potential negative changes in soil acidity SO <sub>2</sub> increase) [Receptor] link

<sup>6</sup> When measured in a straight line over the shortest distance between the asphalt plant site and the Natura 2000 site.

<sup>7</sup> For SPAs, the bird species that are the reason for designation are Species of Conservation Interest (SCIs) and for SACs the habitats and species that are the reason for designation are its Qualifying Interests (QIs). For convenience, the term qualifying interest or QI is used here for both SPAs and SACs.

Natura 2000 Site Name and Code	Distance <sup>6</sup>	Qualifying Interests <sup>7</sup>	Brief Description	Connections (Source-Pathway-Receptor)
		<ul style="list-style-type: none"> <li>• Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]</li> <li>• Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0]</li> <li>• <i>Taxus baccata</i> woods of the British Isles [91J0]</li> <li>• <i>Geomalacus maculosus</i> (Kerry Slug) [1024]</li> <li>• <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029]</li> <li>• <i>Euphydrys aurinia</i> (Marsh Fritillary) [1065]</li> <li>• <i>Petromyzon marinus</i> (Sea Lamprey) [1095]</li> <li>• <i>Lampetra planeri</i> (Brook Lamprey) [1096]</li> <li>• <i>Lampetra fluviatilis</i> (River Lamprey) [1099]</li> <li>• <i>Salmo salar</i> (Salmon) [1106]</li> <li>• <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303]</li> <li>• <i>Lutra lutra</i> (Otter) [1355]</li> <li>• <i>Trichomanes speciosum</i> (Killarney Fern) [1421]</li> <li>• <i>Najas flexilis</i> (Slender Naiad) [1833]</li> <li>• <i>Alosa fallax killarnensis</i> (Killarney Shad) [5046]</li> </ul>	supports 12 Annex II species of flora and fauna, six Annex I bird species and at least 33 Irish Red Data Book species. Many rare bryophytes and invertebrates are also present, several at their only known Irish locations.	
Sheheree (Ardagh) Bog SAC [000382]	2.9 km	<ul style="list-style-type: none"> <li>• Active raised bogs [7110]</li> </ul>	This site is underlain by relatively impermeable muddy limestone	There are Air Emissions (NOx and SO <sub>2</sub> from the

Natura 2000 Site Name and Code	Distance <sup>6</sup>	Qualifying Interests <sup>7</sup>	Brief Description	Connections (Source-Pathway-Receptor)
		<ul style="list-style-type: none"> <li>Degraded raised bogs still capable of natural regeneration [7120]</li> </ul>	<p><i>bedrock. This is overlain by clayey tills with some old red sandstone clasts. The high ground surrounding the site consists of clayey till deposits with patches of gravel. This site developed in a small kettlehole lake with a gradual terrestrialisation leading to the formation of a raised bog. The land surrounding the bog is dominated by agricultural grassland. This small confined raised bog site contains areas of active raised bog, degraded raised bog, carr woodland and marsh/rich-fen vegetation. It is the only remaining raised bog site with an intact surrounding lagg system in the country and this makes it of especially high ecological interest. In addition, the site is the most south-westerly example of a raised bog habitat in the country and is one of only two significant examples of the habitat in Co. Kerry. The presence of the protected semi-aquatic plant species Eriophorum gracile, which is only known from c. 25 sites in Ireland, adds to the ecological interest of the site.</i></p>	<p>asphalt plant) [Source] – Ecological Atmospheric (Dispersal by easterly winds) [Pathway] – Sensitive Vegetation (potential negative changes in vegetation composition due to nutrient (N) increase and potential negative changes in soil acidity SO<sub>2</sub> increase) [Receptor] link</p>
Killarney National Park SPA [004038]	3.5 km	<ul style="list-style-type: none"> <li>Merlin (<i>Falco columbarius</i>) [A098]</li> </ul>	<p><i>This large site (10328ha) encompasses the lakes and part of</i></p>	<p>There are Air Emissions (NO<sub>x</sub> and SO<sub>2</sub> from the</p>



Natura 2000 Site Name and Code	Distance <sup>6</sup>	Qualifying Interests <sup>7</sup>	Brief Description	Connections (Source-Pathway-Receptor)
		<ul style="list-style-type: none"> <li>Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) [A395]</li> </ul>	<p><i>the Macgillycuddy's's Reeks in the vicinity of Killarney. The site is of importance as it supports a good diversity of upland and woodland birds, as well as wintering waterfowl. It is a traditional site for a population of Anser albifrons flavirostris - while the numbers are now low, the population is still of importance as it is the most southerly in the country and also feeds entirely on bogs. Upland species which breed within the site include Falco peregrinus, Falco columbarius, Lagopus lagopus and Turdus torquatus - the latter two species are Red-listed in Ireland. The extensive woodlands support some scarce breeding birds, notably Phoenicurus phoenicurus, Phylloscopus sibilatrix and Sylvia borin. Several research programmes have been carried out, including studies on the bird communities associated with the woodlands, and the wildfowl associated with the lakes. A range of other notable animal and plant species are associated with this site, including Salvelinus alpinus."</i></p>	<p>asphalt plant) [Source] – Ecological Atmospheric (Dispersal by easterly winds) [Pathway] – Sensitive Vegetation (potential negative changes in vegetation composition due to nutrient (N) increase and potential negative changes in soil acidity SO<sub>2</sub> increase) [Receptor] link.</p>

## 2.5 Step 4: Likely Significant Effects

EPA has identified in their screening determination on 05/May/2022 that the plant will emit nitrogen oxides (NO<sub>x</sub>) and sulphur oxides (SO<sub>2</sub>) to air. These emissions will give rise to atmospheric nitrogen and sulphur which could adversely impact qualifying interests at European Sites through nitrogen and sulphur deposition and acidification. Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (site code 000365) includes a number of habitats listed as qualifying interests that are sensitive to nitrogen and sulphur deposition. With regard to Sheheree (Ardagh) Bog SAC (000382), nitrogen deposition levels is an attribute of the Conservation Objectives for the habitat active raised bogs.

The only potential source of impact identified as a result of the operation of the project is the effect on air quality resulting from asphalt plant emissions to air. The main elements of concern are the nitrogen and sulphur composition and concentrations within the exhaust emissions (NO<sub>x</sub> and SO<sub>2</sub>) and the potential for increased levels of nitrogen and sulphur deposition to affect the qualifying interests and conservation objectives of Natura 2000 sites within close proximity to the site.

It has been shown that changes in air quality, and particularly nitrogen deposition, can have a negative effect on the growth of peat-forming species such as Sphagnum and can enhance heather (*Calluna vulgaris*) growth (Thom *et al.* 2019). Similarly, Ferguson *et al.* (1978) showed that sulphur emissions are known to increase atmospheric acid levels and acid deposition can also result in the loss of peat-forming *Sphagnum* spp. However, Thom *et al.* (2019) have also reported that sulphur emissions have declined by around 90% since the 1970s.

The Likely Significant Effects of the Natura 2000 sites identified in section 2.2.4 above are discussed here.

### 2.5.1 Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC [000365]

The emissions of nitrogen and sulphur oxides (NO<sub>x</sub> and SO<sub>2</sub>) from the asphalt plant have the potential to result in likely significant effects on sensitive plant communities within the blanket bogs found within this SAC. The main threats and pressures on the other features of interest and conservation objectives for the site are listed as grazing levels from sheep and deer, and the uncontrolled growth of invasive plant species such as Rhododendron (*Rhododendron ponticum*) (NPWS 2017). Therefore, the potential for likely significant effects, either alone or in combination with existing sources, on the qualifying interest, blanket bog, within this SAC cannot be excluded at this stage without further assessment or mitigation.

### 2.5.2 Sheheree (Ardagh) Bog SAC [000382]

This site lies approximately 3km to the west of the asphalt plant and contains an important active raised bog which is listed as qualifying interest for this SAC as well as a priority habitat under the Habitats Directive. The conservation objective for this qualifying interest is to restore the favourable conservation condition of active raised bogs with a specific target of ensuring that the air quality surrounding bog is close to natural reference conditions, and that the total nitrogen deposition at the bog site should not exceed 5kg N/ha/yr.

In order to confirm that predicted annual nitrogen deposition rates in the locality of the SAC will be within the accepted levels, further assessment is required both of the levels of nitrogen in the exhaust emissions alone, and in combination with existing local nitrogen levels arising from other sources. Therefore, the potential for likely significant effects, either alone or in combination with existing sources, on the qualifying interest, active raised bog, within this SAC cannot be excluded at this stage without further assessment or mitigation.

### 2.5.3 Killarney National Park SPA [004038]

The emissions of nitrogen and sulphur oxides (NO<sub>x</sub> and SO<sub>2</sub>) from the asphalt plant have the potential to result in likely significant effects on sensitive plant communities within the blanket bogs found within this SPA. Greenland White-fronted Goose tend to forage over peat bogs, dune grassland, and occasionally salt marsh, and any change in the soil pH or soil nutrient status could potentially have an effect on the birds' foraging grounds

(BirdWatch Ireland 2022). The other main threats and pressures with effects on the site are listed as intense forestry activities, outdoor sports, and leisure activities, erosion, and urbanisation (NPWS 2020). Therefore, the potential for likely significant effects, either alone or in combination with existing sources, on the qualifying interest, active raised bog, within this SAC cannot be excluded at this stage without further assessment or mitigation.

## 2.6 Conclusions

Without further assessment, it cannot be excluded, on the basis of objective information, that the emissions from the asphalt plant development, individually or in combination with other plans or projects, will have a potential significant effect on the following European sites:

- Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC.
- Sheheree (Ardagh) Bog SAC.
- Killarney National Park SPA.

## 3.0 Stage 2: Appropriate Assessment

### 3.1 Step1, Part 1: Information on the Project

The Project in this case is the air emissions from the permitted asphalt plant. The construction and decommissioning of the asphalt plant have been considered as part of existing planning consent. However, the full asphalt plant development is described in this section to provide an understanding of the generation of the emissions undergoing assessment.

The permitted asphalt plant is a mobile blacktop plant, to be located in the eastern part of the existing sand and gravel pit floor of the Roadstone at Clasheen Townland, Killarney, Co. Kerry.

The following description has been taken from documents under the planning file for planning permission ref. 10/1163:

*“Installation of a mobile black-top plant at Roadstone Wood Ltd., Clasheen, Killarney, Co. Kerry. This mobile plant will produce tarmac products for use in infrastructure projects. The total area required for the proposed development will be 2.07 ha of which the proposed plant will occupy 0.12 ha.*

*The principal elements of the plant will be:*

- Retaining wall;
- Cold storage bins;
- Feeders and associated conveyers;
- Dryer and burner;
- Screener;
- Weight hoppers and associated conveyers;
- Mixer;
- 4 no. bitumen tanks;
- 3 no. filler tanks ;
- Baghouse filter and emission point stack;
- 1 no. fuel tank and a LPG gas tank;
- Hot storage bins and conveyers;
- Control cabin and container; and
- Switch room, transformer, and substation.

A description of the plant and material flow-process through the plant is outlined below:

#### Aggregate cold feed bins

Cold feed bins are constructed and sized to suit the output of the plant. A loading shovel fills the bins with aggregate material available, from onsite stockpiles.

#### Feeder

For maximum efficiency, the aggregate feedstock must be supplied to the plant in the same proportions as in the finished specifications. In order to achieve this, each cold bin is fitted with an outlet device which enables the flow of aggregates to be adjusted.

#### Feed conveyor

The feeder supplies aggregate onto a conveyor and transfers it to the dryer.

## Dryer and associated system

In order to successfully manufacture Black-top materials, it is necessary that the aggregates are virtually free from moisture and at a temperature that will enable the adherence of the bitumen or other binder. The dryer used on this plant is a rotating drum which has the ability to dry road stone type aggregate at high throughputs.

Heat from the dryer is supplied via a burner. This burner will be an Amman burner or equivalent. This burner will utilise fuel to generate heat energy. It is proposed to operate the plant on three possible fuel types, Low Sulphur Gas Oil, 11LS fuel oil or LPG.

The three fuels are in compliance with the percentage sulphur content outlined in S.I. No. 119 of 2008 - *Sulphur Content of Heavy Fuel Oil, Gas Oil, and Marine Fuels Regulations 2008*.

## Screener system

After drying and heating, the hot aggregates are discharged from the dryer into a feed chute of the steel bucket elevator. The elevator is totally enclosed in a light steel casing to prevent the escape of dust and fumes. At this stage the aggregates are proportioned as originally fed to the dryer from the feed unit and having been through the dryer are now mixed. This material needs to be screened. The screening is performed by a vibrating screen onto which the elevator discharges its load.

## Hot Bins

The hot sized aggregate falls directly from the screen to their respective 4 no. compartments of the hot stone storage hoppers (of varying sizes).

Each compartment is fitted with an independently operated outlet door of radial type.

## Bitumen System

The bitumen system consists of four bitumen storage tanks, a circulating pump, piping to the plant and back to the tank with a diverter valve and a weigh hopper. These tanks are double skinned with 200mm insulation.

## Filler Tank System

There are three storage silos for filler material i.e. fine dust. One of these tanks will store the reclaim filler from the bag house filter and one will store imported filler. A proportion of filler will be conveyed to the mixer through an enclosed system, depending on the batch of asphalt being made.

## Weigh Hoppers

Prior to mixing, the constituents of the mixture are weighed into their respective weighing hoppers:

- aggregates, each size separately, into the aggregate weigh hopper
- bitumen into the bitumen weigh hopper
- filler into the filler weigh hopper.

## Mixer

The ingredients of the mixture are discharged from their hoppers into the paddle mixer, aggregate first, followed by bitumen and then filler. The length of time the mixture remains in the mixer is between 30 and 40 seconds.

## Discharge of Material

The finished product can be directly discharged to trucks for immediate delivery to site or alternatively stored in special hot storage bins, with a capacity of 210 tonnes for later use.

## Dust Collection System

The dust extraction system performs two major functions. Firstly, it introduces enough air into the dryer to allow the burner to operate efficiently and to extract the products of combustion at a rate that maintains a negative

pressure within the drum. Secondly, it extracts and collects dust particles entrained in the exhaust gas stream. The size and quantity of dust depends on factors including, gas stream velocity and aggregate type.

To minimise environmental impacts from dust emissions and comply with limit values, emission gases from the dryer are passed through a bag-filter abatement system. This filters the dust from the gas stream prior to discharge to the atmosphere. The baghouse filter is manufactured by Lydall Industrial Filtration EMEA.

This dust collection system complies with the best environmental management practice as set out in the EPA Environmental Management Guidelines – Environmental Management in the Extractive Industry (Non-Scheduled Minerals), 2006 which recommends using appropriate dust filter systems on Black-top plants.

Collected dust from the operation of the baghouse filter is transferred from the filter hopper to the reclaimed filler holding silo for reuse.

## 3.2 Step 1, Part 2: Information on Natura 2000 sites

### 3.2.1 Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC

#### Qualifying Interest Features

Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC has 26 qualifying interest features:

- Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*) [3110]
- Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or Isoeto-*Nanojuncetea* [3130]
- Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation [3260]
- Northern Atlantic wet heaths with *Erica tetralix* [4010]
- European dry heaths [4030]
- Alpine and Boreal heaths [4060]
- *Juniperus communis* formations on heaths or calcareous grasslands [5130]
- Calaminarian grasslands of the *Violetalia calaminariae* [6130]
- Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]
- Blanket bogs (\* if active bog) [7130]
- Depressions on peat substrates of the *Rhynchosporion* [7150]
- Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0]
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0]
- *Taxus baccata* woods of the British Isles [91J0]
- *Geomalacus maculosus* (Kerry Slug) [1024]
- *Margaritifera margaritifera* (Freshwater Pearl Mussel) [1029]
- *Euphydrys aurinia* (Marsh Fritillary) [1065]
- *Petromyzon marinus* (Sea Lamprey) [1095]
- *Lampetra planeri* (Brook Lamprey) [1096]
- *Lampetra fluviatilis* (River Lamprey) [1099]
- *Salmo salar* (Salmon) [1106]
- *Rhinolophus hipposideros* (Lesser Horseshoe Bat) [1303]
- *Lutra lutra* (Otter) [1355]

- *Trichomanes speciosum* (Killarney Fern) [1421]
- *Najas flexilis* (Slender Naiad) [1833]
- *Alosa fallax killarneyensis* (Killarney Shad) [5046]

### Conservation Objectives

The Qualifying Interest within the SAC most likely to be affected by air pollution impacts from the asphalt plant is the *Blanket bogs (\* if active bog)* [7130].

The published Conservation Objectives for Blanket bogs within the Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC read as follows and the unmitigated risk of undermining the Conservation Objectives are listed in Table 2.2:

- To restore the favourable conservation condition of Blanket bogs (\* if active bog) in Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC.

The site-specific conservation objectives for Blanket bogs have been prepared for Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC. In summary these are as follows:

- Habitat area stable or increasing, subject to natural processes.
- No decline, subject to natural processes affecting habitat distribution.
- Maintain soil nutrient status within natural range.
- At least 99% of the total Annex I blanket bog area is active.
- Natural hydrology unaffected by drains and erosion.
- Maintain variety of vegetation communities, subject to natural processes.
- Number of positive indicator species present at each monitoring stop is at least seven.
- Cover of bryophytes or lichens, excluding *Sphagnum fallax*, at least 10%.
- Cover of each of the potential dominant species less than 75%.
- Total cover of negative indicator species less than 1%.
- Cover of non-native species less than 1%.
- Cover of scattered native trees and shrubs less than 10%
- Less than 10% of the *Sphagnum* cover is crushed, broken and/or pulled up.
- Last complete growing season's shoots of *ericoids*, crowberry (*Empetrum nigrum*) and bog-myrtle (*Myrica gale*) showing signs of browsing collectively less than 33%.
- No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning.
- Cover of disturbed bare ground less than 10%.
- Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.
- Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas.
- No decline in distribution or population sizes of rare, threatened, or scarce species associated with the habitat.

### Conservation Condition Assessment

The National Conservation Assessment (NCA) for Annex I habitats (NPWS, 2013) was utilised to indicate condition of the Blanket bogs in the SAC, and it was determined that the NCA for Blanket bogs (\*if active bog) was Unfavourable – Bad for both area and structure and functions.



### 3.2.2 Sheheree (Ardagh) Bog SAC

#### Qualifying Interest Features

Sheheree (Ardagh) Bog SAC has two qualifying interest features:

- Active raised bogs [7110], and
- Degraded raised bogs still capable of natural regeneration [7120]

#### Conservation Objectives

The published Conservation Objectives for Sheheree (Ardagh) Bog SAC read as follows, and the unmitigated risk of undermining the Conservation Objectives for the site are listed in Table 2.3:

- To restore the favourable conservation condition of Active raised bogs in Sheheree(Ardagh) Bog SAC, and,
- The long-term aim for Degraded raised bogs still capable of natural regeneration is that its peat-forming capability is re-established; therefore, the conservation objective for this habitat is inherently linked to that of Active raised bogs (7110) and a separate conservation objective has not been set in Sheheree (Ardagh) Bog SAC.

Site-specific conservation objectives for Active raised bogs have been prepared for the Sheheree (Ardagh) Bog SAC. In summary these are as follows:

- Restore area of active raised bog to 4.9ha, subject to natural processes
- Restore the distribution and variability of active raised bog across the SAC
- No decline in extent of high bog necessary to support the development and maintenance of active raised bog
- Restore appropriate water levels throughout the site
- Restore, where possible, appropriate high bog topography, flow directions and slopes
- Restore adequate transitional areas to support/protect active raised bog and the services it provides
- Restore 2.5ha of central ecotope/active flush/soaks/bog woodland as appropriate
- Restore adequate cover of high quality micro-topographical features
- Restore adequate cover of bog moss (*Sphagnum*) species to ensure peat-forming capacity
- Restore, where appropriate, typical active raised bog flora
- Maintain features of local distinctiveness, subject to natural processes
- Negative physical features absent or insignificant
- Native negative indicator species at insignificant levels
- Non-native invasive species at insignificant levels and not more than 1% cover
- Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr.
- Water quality on the high bog and transitional areas close to natural reference conditions.

As mentioned above, the site-specific conservation objectives for Degraded raised bogs are inherently linked to those of Active raised bogs and achieving the conservation objectives for Active raised bogs will naturally lead to the restoration of the Degraded raised bogs and their regeneration to active raised bogs.

#### Conservation Condition Assessment

An assessment of the condition of the Sheheree (Ardagh) Bog SAC was conducted in 2012 as part of the national Raised Bog Monitoring and Assessment Survey conducted on behalf of NPWS (Fernandez et al. 2014). This survey was a follow-up to the assessment survey that was conducted in 2005 (Fernandez et al. 2005).

The 2013 survey gave the overall raised bog at Sheheree SAC an *Unfavourable Bad-Stable* assessment. The Active raised bog was given an overall *Unfavourable Bad-Stable* conservation status assessment although it was found that the Habitat Area and quality had remained unchanged during the reporting period 2005 – 2012. While the area value was found to be below favourable reference values, the Structure and Functions (the physical components of a habitat “*structure*”, and the ecological processes that drive it “*functions*”) were seen as being above reference value. Future prospects were considered *Unfavourable Bad-Stable* as the few identifiable negative impacts had yet to be directly addressed.

### 3.2.3 Killarney National Park SPA [004038]

#### Qualifying Interest Features

Killarney National Park SPA has two qualifying interest features:

- Merlin *Falco columbarius* [A098], and
- Greenland White-fronted Goose *Anser albifrons flavirostris* [A395]

#### Conservation Objectives

There are no detailed Conservation Objectives written for this site with specific attributes and targets, but the published Conservation Objectives for Killarney National Park SPA read as follows, and the unmitigated risk of undermining the Conservation Objectives for the site are listed in Table 2.4:

- To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA.

There are no site- or species-specific conservation objectives written for the site.

## 3.3 Step 3, Part 1: Effects on the Integrity of Natura 2000 Sites ‘Alone’

### 3.3.1 Air quality impacts resulting from the asphalt plant air emissions

Once the asphalt plant is operational, emissions comprising mainly of nitrogen oxide and sulphur dioxide will be emitted into the atmosphere. There are two main pathways by which the gases and aerosols are removed from the atmosphere; dry deposition and wet deposition. Dry deposition is associated with emissions from industrial or power generating installations with gravitational deposition of NO<sub>x</sub> and SO<sub>2</sub> from the plume as it travels downwind and wet deposition which is primarily associated with removal of the aerosols by precipitation (Envirocon 2021).

Peatlands are known to be highly sensitive to air pollution, particularly nitrogen deposition and reactive nitrogen can cause soil nutrient enrichment resulting in changes in both species composition and the functioning of peatlands. With long-term elevated nitrogen deposition, vegetation composition can show significant declines in bryophyte species-richness and productivity and shifts in composition toward vascular plants species adapted to higher nutrient levels, with an overall loss of diversity (NPWS 2015). Sulphide deposition can result in soil acidification, also leading to changes in vegetation composition, particularly within Sphagnum species which may alter the peat-forming ability within a bog.

As part the response to a Request for Further Information (RFI) from Kerry County Council (Ref. No. AP-20-01) in 2020 regarding the measure of nitrogen deposition levels and their cumulative effects, additional information was provided by Envirocon (February 2021) which assessed the spatial pattern of NO<sub>x</sub> and SO<sub>2</sub> annual average concentrations (µg/m<sup>3</sup>) and N deposition rates (kgN/ha/yr) due to maximum permitted emissions from the asphalt plant and the potential impact of NO<sub>x</sub> and SO<sub>2</sub> on Sheheree Bog SAC. The study concluded that the predicted impact of emissions from the asphalt plant will have an imperceptible contribution on existing air quality and nitrogen (N) deposition at the Sheheree Bog SAC. The full report is available in Appendix A.

Following the EPA updated determination on the 5<sup>th</sup> May 2022 confirming that an Appropriate Assessment (Stage 2 NIS) was required and that potential air quality effects on Killarney National Park, Macgillicuddy Reeks and Caragh River Catchment SAC, and Killarney National Park SPA should also be assessed, Envirocon repeated the air quality dispersion modelling exercise to predict the long-term impacts of NO<sub>x</sub>, SO<sub>2</sub> and N deposition on these three Natura 2000 sites. The full results of the modelling can be found in the addendum report in Appendix B.

The emission scenario used in the air quality modelling exercise at each of the SAC/SPA sites is conservative and a 'worst-case emission scenario' in that it is based on maximum continuous emissions of NO<sub>x</sub> and SO<sub>2</sub> during the day-time permitted hours, 6 days a week throughout the year. Furthermore, the hourly emission rates are based on maximum concentrations in the stack exhaust of 350 mg/Nm<sup>3</sup> for NO<sub>x</sub> and 250 mg/Nm<sup>3</sup> for SO<sub>2</sub>.

**The results of the updated modelling study demonstrate that both the additional loading on ambient concentrations of NO<sub>x</sub> and SO<sub>2</sub> and deposition of N at each of the sites due to emissions from the asphalt plant are determined as insignificant.**

A summary of the predicted impacts at the boundaries of the three Natura 2000 sites nearest to the asphalt plant are provided in Table 3.1.

**Table 3.1: Predicted annual air quality impact at nearest Natura 2000 Sites**

Natura 2000 Site	Distance/Direction from asphalt plant (km)	NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	N Deposition (kgN/ha/yr)
		Annual Average <sup>(i)</sup>	Annual Average <sup>(i)</sup>	Annual
Killarney National Park, Reeks & Caragh River SAC	0.63km to South	(1) 10	(<1) 4	0.3
Sheheree (Ardagh) Bog SAC	2.9km to west	(<0.1) <2	(0.05) <2	0.02
Killarney National Park SPA	3.5km to West	(<0.1) <2	(<0.1) <2	<0.02
NAQS/Critical Load		30	20 (10) <sup>(iii)</sup>	5

<sup>(i)</sup> Stack contribution (Process Contribution PC) in (), PEC = PC + background concentration

<sup>(iii)</sup> 10 µg/m<sup>3</sup> Critical level for protection of lichens, mosses, and other raised bog plant species

The predicted long-term NO<sub>x</sub> and SO<sub>2</sub> concentrations due to emissions from the asphalt plant are equivalent to <1% of the NAQS critical levels at the Sheheree Bog SAC and Killarney National Park SPA. At the nearest boundary of the Killarney National Park, Macgillicuddy Reeks and Caragh River SAC, which is only 0.63km from the plant and also adjacent to the N22, the predicted concentration is <3% of the NO<sub>x</sub> and <5% of the SO<sub>2</sub> NAQS.

The long-term effect of N deposition due to NO<sub>x</sub> emissions from the asphalt plant at the conservation sites are less than 1% of the Critical Load of 5 kgN/ha/yr at the Sheheree Bog SAC and Killarney Nation Park SPA. For the SAC boundary near the N22 the N deposition rate is predicted to be equivalent to 6% of the Critical load. However, along the River Flesk the potential additional N deposition decreases to below 2%.

**These results confirm the conclusions of the 2022 Envirocon report that impacts from the asphalt plant emissions will have an imperceptible effect on the existing air quality and N deposition at the three conservation sites.**

### 3.3.2 Effects on Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC

A Conservation Objective attribute to assess the soil nutrients within the blanket bogs has been set with a view to 'maintain the soil nutrient status within the natural range' suited to the habitat. However, relevant nutrients

and natural ranges have yet to be defined, although nitrogen deposition and associated acidification are noted as being relevant to the status of blanket bogs (NPWS 2013).

The air quality modelling study conducted by Envirocon (2022) to evaluate the potential impact of emissions on this SAC at the site boundary which is 0.6km from the asphalt plant. This study showed that the annual average levels for NO<sub>x</sub> and SO<sub>2</sub> levels at the SAC site were imperceptibly low (<2 µg/m<sup>3</sup> for NO<sub>x</sub> and <2µg/m<sup>3</sup> for SO<sub>2</sub>) at this distance from the asphalt plant. The blanket bogs found in Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC are located >3km from the asphalt plant and also in the highland areas of the site.

**These are therefore at a greater distance and at a higher altitude than the SAC boundary and therefore the effects of emissions from the asphalt plant will be lower again and they can be considered imperceptible and there will be no likely significant effects on the sensitive habitats site.**

### 3.3.3 Effects on Sheheree Bog SAC

The air quality modelling study using the Atmospheric Dispersion Modelling System (ADMS5) advanced model was undertaken by Envirocon (2021) to evaluate the potential impact of emissions on Sheheree Bog SAC, which lies approximately 2.8km to the west of the asphalt plant. The predicted and SO<sub>2</sub> annual **ambient ground-level concentrations** in the locality of Sheheree Bog SAC are 0.06 µg/m<sup>3</sup> NO<sub>x</sub> and 0.04 µg/m<sup>3</sup> SO<sub>2</sub> respectively (Appendix B). These values are the potential deposition rates due to maximum emissions from the asphalt plant exhaust stack on air quality at the SAC.

In order to confirm that predicted **annual nitrogen and sulphur deposition rates** in the locality of the SAC will also be very low, the ADMS5 model was run to predict annual Nitrogen deposition rates due to maximum NO<sub>x</sub> emissions from the plant exhaust stack. The NO<sub>x</sub> annual deposition rate was found to be 0.015 kgN/ha/yr at the SAC, and the SO<sub>2</sub> annual deposition rate was found to be 0.04 µg/m<sup>3</sup>. Therefore, the model would indicate that the emissions from the asphalt plant are adding an imperceptible amount of nitrogen and sulphur through deposition to the peatlands of Sheheree Bog.

The conservation objective for Sheheree (Ardagh) Bog SAC states that the annual nitrogen deposition target of 5 kgN/ha/yr should not be exceeded and this is at the lower limit of the critical load value of between 5-10 kgN/ha/yr considered appropriate for raised bogs.

The predicted rate of 0.015 kg N/ha/yr is 0.5% of the lower critical load conservation target of 5 kgN/ha/yr specified for Sheheree Bog, (Envirocon 2022), see Appendix B, and an increment of 1% or less of the relevant annual critical load alone is considered inconsequential (IAQM 2020).

**Therefore, it can be concluded that air emissions from the asphalt plant at the boundary of this site will be imperceptible and there will be no likely significant effects on the sensitive habitats site.**

### 3.3.4 Effects on Killarney National Park SPA

As mentioned the Greenland White-fronted Goose forage over peat bogs and any change in the soil pH or soil nutrient status could potentially have an effect on the birds' foraging grounds. However, in recent years it has been observed that these birds are increasing foraging in agricultural grasslands due their increased nutrient value and are focusing less on bog and upland habitats (BirdWatch Ireland 2022). Therefore, the Greenland White-fronted Goose is now less reliant on the blanket bogs within this SPA, and they are not likely to be significantly affected by any potential changes in vegetation within the foraging habitats within the SPA.

**Killarney National Park SPA is also the site furthest from the asphalt plant of the three Natura 2000 sites assessed. Therefore, it can be concluded that air emissions from the asphalt plant at the boundary of this site will be imperceptible and there will be no likely significant effects on the sensitive habitats site.**

### 3.4 Step 3, Part 2: Effects on the Integrity of Natura 2000 sites 'In Combination'

The following plan was considered together with the proposed asphalt plant for potential cumulative effects:

- Kerry County Development Plan 2015 – 2021
- Kerry County Development Plan 2022 – 2028 (in preparation)

In Section 8 (Natural Resources) the Council objective NR-5 sets out to *'Ensure all extractive development proposals comply with the objectives of this plan as they relate to development management standards, flood risk management requirements and the protection of landscape, biodiversity, infrastructure, water and air quality, built and cultural heritage and residential amenity'*

The Development Plan states that *'the main threat to air quality is emissions from road traffic and coal fires'*.

There are no strategies or objectives in the County Development Plan that are likely to result in significant effects when considered in-combination with the permitted asphalt plant.

This assessment of cumulative effects therefore focuses on future potential additional sources of emissions in the area, that have the potential to significantly increase the background concentrations of emissions. Kerry County Council planning portal was accessed to examine planning applications in the vicinity of the site for potential to act in-combination with the project (i.e. projects that could result in significant industrial emission sources).

Planning applications within the local area are mainly restricted to single or small numbers of dwellings or dwelling extensions, along with some larger residential developments and commercial development in Killarney, and some aggregate extraction operations in the surrounding areas. No applications which have the potential to significantly increase the background concentrations of emissions were identified, and as such there are no applications that are likely to result in significant effects when considered in-combination with the proposed asphalt plant.

While there are no plans or projects which could act in combination with the permitted asphalt plant there are other activities which can cumulatively add to the overall amount of nitrogen deposition in the area such as agricultural emissions and the burning of fossil fuels.

The Conservation Objectives for the Sheheree SAC gives a rate of N deposition above the upper critical load value of 11.4 kgN/ha/yr, with a reference to the Henry & Ahearne 2014 study. However, more recent results from modelling emissions and atmospheric chemistry using 2018 data are available (EMEP 2020). This report shows that the trend since the year 2000 in terms of annual oxidised N deposition is a reduction from 21,000 tonnes in the year 2000 by 38% to 13,000 tonnes in 2018. In comparison, the trend in NH<sub>3</sub> emissions shows a very small change in NH<sub>3</sub> emissions over these years, increasing by 2% from 42,000 tonnes in the year 2000 to 43,000 tonnes in 2018.

Since the primary source of NH<sub>3</sub> deposition in Ireland is attributed to agricultural emissions with insignificant levels from burning fossil fuels, it is evident that control of emissions from this sector is the main factor in reducing potential long-term total N deposition impacts at raised bogs in Ireland. Furthermore, the results from the 2020 EMEP report indicate that annual oxidised N deposition in the Kerry area is estimated at 1-2 kgN/ha/yr, with trans-boundary N wet deposition approximately 60-70% of the annual deposition. In terms of annual RedN deposition rates, the annual rate is estimated at about 2-3 kgN/ha/yr, with below 20% from trans-boundary sources. Therefore an estimate of 3 – 5 kgN/ha/yr for annual total N deposition is significantly lower than the 11.4 kgN/ha/y referenced in the NPWS conservation objectives for Sheheree bog SAC (Envirocon 2021). This being the case the baseline of less than 5kgN/ha/yr is currently being met the emissions from the plant will not change the levels when considered in combination with baseline and other developments.

**Cumulative effects on Killarney National Park, Reeks & Caragh River SAC, Sheheree Bog SAC and Killarney National Park SPA are therefore not predicted to occur as a result of the emissions to air from the asphalt plant at Clasheen Townland, Killarney, Co. Kerry.**

## 3.5 Step3, Part 3: Implications for the Conservation Objectives

### 3.5.1 Unmitigated risks on Natura 2000 sites

The unmitigated risks for the asphalt plant emissions to undermine the conservation objectives for Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC, and Sheheree (Ardagh) Bog SAC are set out in Tables 2.2 and 2.3 below.

There are no written conservation objectives for Killarney National Park SPA but as there will be no risk to the integrity of the blanket bog foraging areas within Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC, and the fact that these birds are frequently utilising agricultural grasslands as preferred foraging areas, there will be no likely significant effects on the Site's conservation objectives.

**Table 2.2: Unmitigated risk of undermining the Conservation Objectives for Blanket Bogs (\* if active bog) [7130] within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC**

Conservation Objective	Maintain or Restore	For the Project Alone	For the Project in combination with other Plans and Projects
Habitat area stable or increasing, subject to natural processes	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO <sub>2</sub> levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, and the main influence for the restoration of the blanket bog is the maintenance of the hydro-ecological conditions.	No risk
No decline, subject to natural processes affecting habitat distribution.	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO <sub>2</sub> levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, and the main influence for the restoration of the blanket bog is the maintenance of the hydro-ecological conditions.	No risk
Maintain soil nutrient status within natural range	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO <sub>2</sub> levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, the soil nutrient status will not be affected by the asphalt plant emissions.	No risk



Conservation Objective	Maintain or Restore	For the Project Alone	For the Project in combination with other Plans and Projects
At least 99% of the total Annex I blanket bog area is active	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO2 levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, and the main influence for the restoration of the blanket bog is the maintenance of the hydro-ecological conditions.	No risk
Natural hydrology unaffected by drains and erosion	R	No risk. The project will not affect the hydrological conditions within blanket bogs	No risk
Maintain variety of vegetation communities, subject to natural processes	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO2 levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, and the main influence for the restoration of the blanket bog is the maintenance of the hydro-ecological conditions.	No risk
Number of positive indicator species present at each monitoring stop is at least seven	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO2 levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, there will be no effect on the positive indicator species within the blanket bogs.	No risk

Conservation Objective	Maintain or Restore	For the Project Alone	For the Project in combination with other Plans and Projects
Cover of bryophytes or lichens, excluding <i>Sphagnum fallax</i> , at least 10%.	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO2 levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, there will be no effect on the bryophytes or lichens within the blanket bogs.	No risk
Cover of each of the potential dominant species less than 75%.	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO2 levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, there will be no effect on the dominant species within the blanket bogs.	No risk
Total cover of negative indicator species less than 1%.	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO2 levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, there will be no effect on the negative indicator species within the blanket bogs.	No risk
Cover of non-native species less than 1%.	R	No risk. The project will not affect non-native species within the site.	No risk
Cover of scattered native trees and shrubs less than 10%	R	No risk. The project will not affect scattered native trees and shrubs within the site.	No risk

Conservation Objective	Maintain or Restore	For the Project Alone	For the Project in combination with other Plans and Projects
Less than 10% of the <i>Sphagnum</i> cover is crushed, broken and/or pulled up	R	No risk. The project will not affect crushed <i>Sphagnum</i> cover within the site.	No risk
Last complete growing season's shoots of ericoids, crowberry ( <i>Empetrum nigrum</i> ) and bog-myrtle ( <i>Myrica gale</i> ) showing signs of browsing collectively less than 33%	R	No risk. The project will not affect the growing season of plant species within the site.	No risk
No signs of burning in sensitive areas, into the moss, liverwort or lichen layer or exposure of peat surface due to burning	R	No risk. The project will not affect burning practices within the site.	No risk
Cover of disturbed bare ground less than 10%.	R	No risk. The project will not affect areas of bare ground within the site.	No risk
Area showing signs of drainage from heavy trampling, tracking or ditches less than 10%.	R	No risk. The project will not affect drainage areas within the site.	No risk
Less than 5% of the greater bog mosaic comprises erosion gullies and eroded areas	R	No risk. The project will not affect erosion gullies and eroded areas within the site.	No risk
No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NO <sub>x</sub> and SO <sub>2</sub> levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, there will be no effect on the distribution or population sizes of rare, threatened or scarce species associated with the habitat.	No risk

**Table 2.3: Unmitigated risk of undermining the Conservation Objectives for Active Raised Bogs [7110] within Sheheree (Ardagh) Bog SAC**

Conservation Objective	Maintain or Restore	For the Project Alone	For the Project in combination with other Plans and Projects
Restore area of active raised bog to 4.9ha, subject to natural processes	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO2 levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, and the main influence for the restoration of the active raised bog is the maintenance of the hydro-ecological conditions.	No risk
Restore the distribution and variability of active raised bog across the SAC	R	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO2 levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, and the main influence for the restoration of the active raised bog is the maintenance of the hydro-ecological conditions.	No risk
No decline in extent of high bog necessary to support the development and maintenance of active raised bog	M	No risk: As this habitat is sufficiently distant from the asphalt plant, NOx and SO2 levels will be imperceptibly low, and the air quality has improved in recent years, and will continue to improve, and the main influence for the restoration of the active raised bog is the	No risk

Conservation Objective	Maintain or Restore	For the Project Alone	For the Project in combination with other Plans and Projects
		maintenance of the hydro-ecological conditions.	
Restore appropriate water levels throughout the site	R	No risk: water levels will not be affected by the asphalt plant emissions.	No risk
Restore, where possible, appropriate high bog topography, flow directions and slopes	R	No risk: the main influence for the restoration of the high bog is the hydro-ecological conditions and in particular the water levels around the bog, and this will not be affected by the project.	No risk
Restore adequate transitional areas to support/protect active raised bog and the services it provides	R	No risk: The restoration of adequate transitional areas to support/protect active raised bog and their services will not be affected by the asphalt plant emissions.	No risk
Restore 2.5ha of central ecotope/active flush/soaks/bog woodland as appropriate	R	No risk: The main influence for the restoration of the central ecotope/active flush/soaks/bog woodland is the hydro-ecological conditions which will not be affected by the asphalt plant	No risk
Restore adequate cover of high quality micro-topographical features	R	No risk: micro-topographical features will not be affected by the asphalt plant	No risk

Conservation Objective	Maintain or Restore	For the Project Alone	For the Project in combination with other Plans and Projects
Restore adequate cover of bog moss (Sphagnum) species to ensure peat-forming capacity	R	No risk: the main driver for the restoration of the bog moss is the hydro-ecological conditions.	No risk
Restore, where appropriate, typical active raised bog flora	R	No risk: the main driver for the restoration of the bog flora is the hydro-ecological conditions.	No risk
Restore, where appropriate, typical active raised bog fauna	R	No risk: the main driver for the restoration of the bog fauna is the over-all condition of the SAC.	No risk
Maintain features of local distinctiveness, subject to natural processes	M	No risk: the main driver for maintenance of features of distinctiveness is the hydro-ecological conditions and prevention of damage from peat cutting and drainage.	No risk
Negative physical features absent or insignificant	M	No risk: the main driver for preventing negative physical features is the maintenance of hydro-ecological conditions and prevention of damage from peat cutting and drainage.	No risk
Native negative indicator species at insignificant levels	M	No risk: Indicators of disturbance on a raised bog is the presence of species indicative of drying out conditions.	No risk

Conservation Objective	Maintain or Restore	For the Project Alone	For the Project in combination with other Plans and Projects
Non-native invasive species at insignificant levels and not more than 1% cover	R	No risk: Spread of non-native invasive species will not be affected by the asphalt plant emissions.	No risk
Air quality surrounding bog close to natural reference conditions. The total N deposition should not exceed 5kg N/ha/yr.	R	No risk: The predicted NO <sub>x</sub> and SO <sub>2</sub> annual ambient ground-level concentrations in the locality of Sheheree Bog SAC are 0.06 µg/m <sup>3</sup> and 0.04 µg/m <sup>3</sup> respectively. The predicted annual rate for nitrogen deposition at the Sheree Bog site is 0.5% of the lower critical load conservation target of 5 kgN/ha/yr specified for Sheheree Bog (Envirocon 2022) and is considered as having an inconsequential risk.	No risk: There is no risk from other plans or projects in the area and any additional nitrogen deposition will not result in excessive levels of nitrogen. Ambient levels are sufficiently low and will not have any significant effect on the SAC – see section 2.3.4 and Appendix B
Water quality on the high bog and transitional areas close to natural reference conditions.	R	No risk: the main drivers for the restoration of water quality is the local hydrochemistry conditions and impacts on ground water.	No risk



### 3.6 Step 4: Mitigation Measures

The following mitigation measures will be implemented to control and monitor the levels of emissions from the stack of the asphalt plant.

- Plant will be operated as per the conditions notified by KCC in the Notification of Grant of an Air Licence (AP 2001 2).
- The emissions limits proposed by Roadstone for NO<sub>x</sub> (350 mg/Nm<sup>3</sup>) and SO<sub>2</sub> (250 mg/Nm<sup>3</sup>) are significantly below the values stated in the air emissions licence as per the conditions notified by KCC in the Notification of Grant of an Air Licence (AP 2001 2) which were NO<sub>x</sub> (450 mg/Nm<sup>3</sup>) and SO<sub>2</sub> (350 mg/Nm<sup>3</sup>) respectively.
- Continuous Stack monitoring system with an alarm system for particulates with alerts and recording of results. The alerts will enable all operations to cease if an alert is recorded. Production will not operate until the issue is identified and resolved. Operating procedure in place for the operator to follow when notified by an alarm.
- Advanced Process Control System with the plant connected to an online 24/7 diagnostic maintenance system operated by Amman (plant manufacturer) to enable and identify any problems or issues with the plant.
- Bitumen in tanks is kept at operational temperature using electric heaters as an alternative to fuel-fired heaters which will further reduce NO<sub>x</sub> and SO<sub>2</sub> emissions
- Use of Low Sulphur Gas Oil, 11LS fuel oil or LPG.
- Inspection and service of burner at commissioning of the plant and every 6 months thereafter.
- Stack emissions to be monitored by independent party (Socotec or equivalent) each month for first 6 months and every quarter thereafter.
- The plant is audited and accredited by NSAI.
- Environment Management System will be updated with the requirements of an issued air licence.

With these mitigation measures in place, it has been shown that nitrogen and sulphur deposition levels at Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, Sheheree (Ardagh) Bog SAC and Killarney National Park SPA are imperceptible and will ensure that the conservation objectives for these sites are not undermined by the project, either alone or in combination with other plans and projects.

## 4.0 Conclusion

**With the further assessment and identified mitigation measures in place, it can be concluded, beyond all reasonable scientific doubt, that the Project, either alone or in combination with other plans and projects will not undermine the conservation objectives of any Natura 2000 sites and therefore would not have an adverse effect on the integrity of any Natura 2000 sites, in view of the sites' conservation objectives and best scientific knowledge with the further assessment and identified mitigation measures.**

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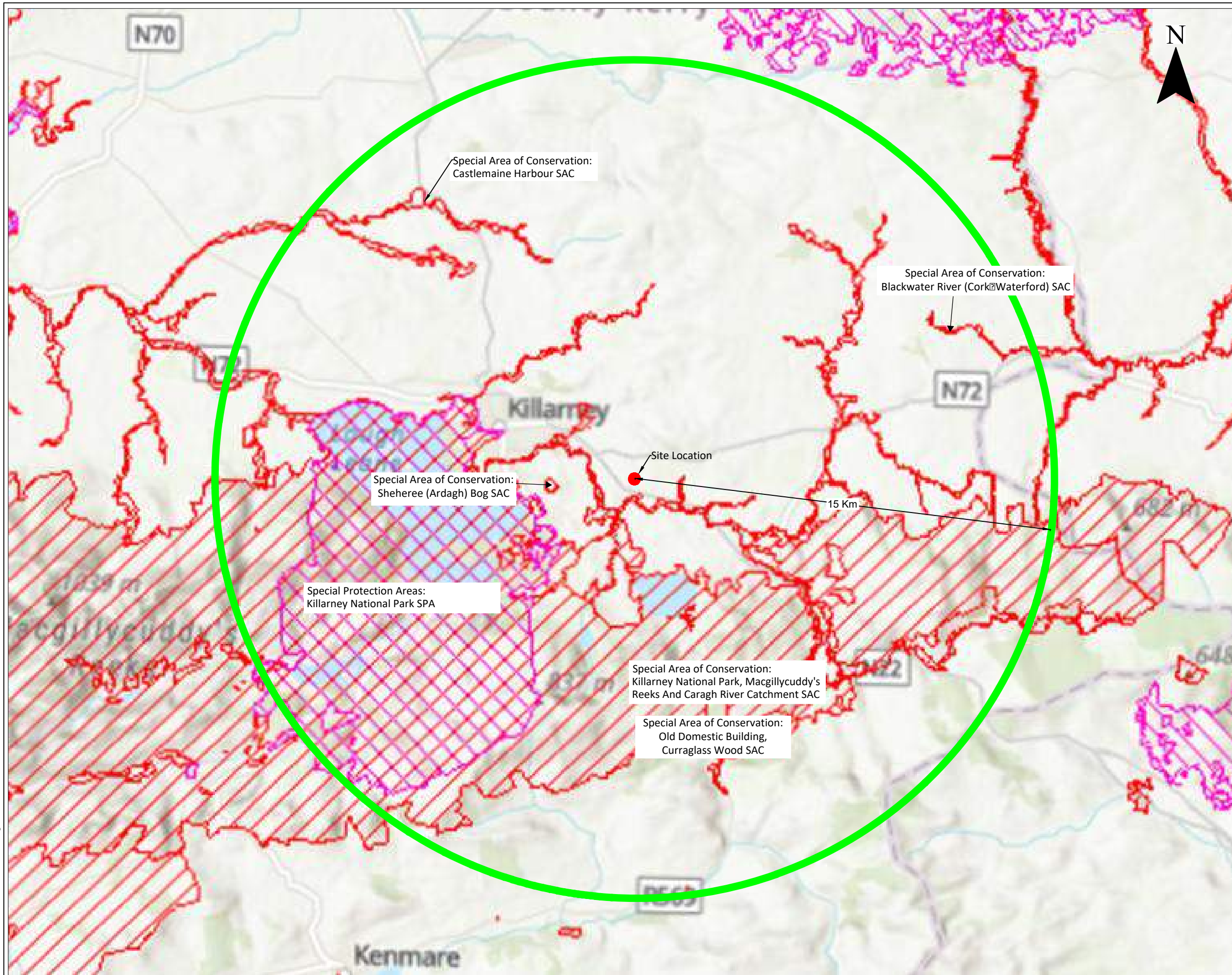
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## DRAWINGS

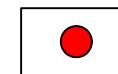
Figure 1: Natura 2000 Site Locations



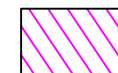
## NOTES

## 1. EXTRACT FROM NPWS ONLINE MAPPING

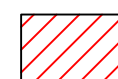
### LEGEND




## SITE LOCATION



SPECIAL PROTECTION AREA



SPECIAL AREA OF  
CONSERVATION

**SLR** 

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**ROADSTONE LIMITED**  
**NATURA IMPACT STATEMENT: STAGE II**

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**PROPOSED ASPHALT PLANT**  
**CLASHEEN TOWNLAND, KILLARNEY, CO. KERRY**

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**NATURA 2000 SITE LOCATIONS**

**FIGURE 1**

Scale  
NOT TO SCALE

Date MAY 2022

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## APPENDIX A

Envirocon (2021): Application for an Air Emissions Licence (AP-20-01: Request for Clarification of Further Information) Proposed Asphalt Plant, Roadstone Ltd., Clasheen, Killarney, Co Kerry



**APPLICATION FOR AN AIR EMISSIONS  
LICENCE**

**(AP-20-01: REQUEST FOR CLARIFICATION OF FURTHER  
INFORMATION)**

**PROPOSED ASPHALT PLANT**

**ROADSTONE LTD.  
CLASHEEN  
KILLARNEY, CO. KERRY**



*Air Pollution  
and Environmental Consultancy*

**APPLICATION FOR AN AIR EMISSIONS LICENCE  
(AP-20-01: REQUEST FOR CLARIFICATION OF FURTHER  
INFORMATION)**

**PROPOSED ASHPALT PLANT**

**CLASHEEN, KILLARNEY  
CO. KERRY**

**ROADSTONE LTD.  
CLASHEEN  
KILLARNEY, CO. KERRY**

Client	SLR Consulting Ltd.
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Circulation	Peter Kinghan
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Date	22/03/2021



**ITEM 1:**

*You are requested to submit an amended Appropriate Assessment Screening Report (by way of an AA Screening addendum report or otherwise) clarifying the following:-*

- Please clarify how the Nitrogen Deposition target of 5kg N/ha/yr for Sheheree (Ardagh) Bog SAC, as outlined in the Conservation Objectives for that SAC, would be impacted by the proposal, if at all. As part of this, you are requested to note that the Conservation Objectives document outlines that the measure for Nitrogen Deposition assessment as it relates to the Sheheree (Ardagh) Bog SAC is kg N/ha/year and accordingly this is the measure which should be used in the Appropriate Assessment Screening report.*
- Address within the cumulative effects considerations, that Nitrogen deposition rates within Sheheree (Ardagh) Bog SAC may currently exceed the 5kg N/ha/yr target as outlined in the notes accompanying 'Air Quality Nitrogen Deposition,' in the Conservation Objective report for the SAC. Additional cumulative sources of nitrogen deposition on the Bog should also be taken into consideration such as those possibly arising from transport and agriculture.*
- Confirm that no measures are proposed which are intended to reduce or avoid impact on Sheheree (Ardagh) Bog SAC or any other Natura 2000 sites.*

**Response**

This AA Screening addendum report has been prepared by Envirocon, with input from SLR Consulting.

**1.0 Pollutant deposition processes**

There are 2 main pathways by which gases and aerosols are removed from the atmosphere; dry deposition close to the emission source and wet deposition which is primarily associated with removal by precipitation. Dry deposition is associated with emissions from industrial or power generating installations with removal of NO<sub>x</sub> and SO<sub>2</sub> from the plume as it travels downwind with the gases removed by gravity and the aerosols land on vegetation where the exposed leaves adsorb the air pollutants. The process is caused by turbulent diffusion within the lower air layers above the ground and is related to the concentration of the gas and the deposition velocity. The removal process is especially important for ammonia emissions emitted from farming livestock, especially from dairy cattle herds, and to a lesser extent from slurry spreading.

Wet deposition removal is associated with trans-boundary emissions, originating from emissions at power stations and large industries with the emission plume being incorporated and converted into secondary pollutant aerosols of nitrate and sulphate, within cloud-water. These aerosols are transported many 100's or even 1000's of kilometres as trans-boundary emissions before falling from clouds as acid deposition. This process is known as rain-out of secondary pollutant aerosols. A second process may also occur with wet deposition of NO<sub>x</sub> emissions from below the cloud base by precipitation, a process known as wash-out. This is only significant downwind of major emission sources such as large industrial areas or power stations. Wet deposition is the principal deposition pathway in upland areas due to high rates of rainfall and direct transfer of cloud-water droplets to vegetation when low cloud persists over high ground.

The total deposition load of Nitrogen and Sulphur at ecologically sensitive sites is the sum of dry and wet deposition. Deposition of total nitrogen (N) can be as oxidised nitrogen (NO, NO<sub>2</sub>, N<sub>2</sub>O and as NO<sub>3</sub> nitrate aerosol) and as reduced N (RedN) (NH<sub>3</sub> and NH<sub>4</sub>). Sulphur deposition occurs as gaseous SO<sub>2</sub> and also as secondary SO<sub>4</sub> sulphate aerosol.

In County Kerry, the principal deposition pathway for oxidised N and S is by dry deposition compared to wet deposition, especially where the emission source is close to the ecologically sensitive area. In the case of RedN, over 90% of NH<sub>3</sub> is deposited as dry deposition within a few kilometres of where emissions from farming activities occur.

## **2.0 Air Quality Model Impact Evaluation**

An air quality modelling study using the ADMS5<sup>(1)</sup> advanced model was undertaken to evaluate the potential impact of emissions in the area from the proposed asphalt plant at Clasheen as part of the Air Emissions Licence application. This report by Envirocon<sup>(2)</sup> detailed the methodology and input and output parameters of the ADMS5, including a section on potential air concentration impacts at ecological sensitive sites (Section 5.4), including Sheheree Bog SAC.

The Environmental Protection Agency in Ireland (Environmental Management in the Extractive Industry (non-scheduled minerals): Environmental Management Guidelines (2006)) recommend the following Emission Limit Values for emissions to air arising from asphalt plants regulated under the Air Pollution Act, 1987: • Sulphur dioxide 500 mg/Nm<sup>3</sup> • Nitrogen oxide 450 mg/Nm<sup>3</sup> • Dust 50 mg/Nm<sup>3</sup>.

The predicted NO<sub>x</sub> and SO<sub>2</sub> annual ambient concentrations in the locality of Sheheree Bog SAC, approximately 2.8km to the west of the asphalt plant are shown in Figure 1 and 2, as ground level concentration contour plots. These values are the potential effects due to maximum emissions from the asphalt plant exhaust stack on air quality at the SAC, ie. the Process Contribution (PC). The results demonstrate that compared to the ambient critical level for NO<sub>x</sub> specified in the National Air Quality Standards (NAQS)<sup>(3)</sup> of 30 µg/m<sup>3</sup> for the protection of vegetation, the maximum long-term impact near the SAC is <0.5% of the limit value specified in the NAQS. The corresponding maximum predicted annual SO<sub>2</sub> concentration is also <1% of the annual critical level of 10 µg/m<sup>3</sup> applied to lichens, mosses and other raised bog plant species (IAQM)<sup>(4)</sup>.

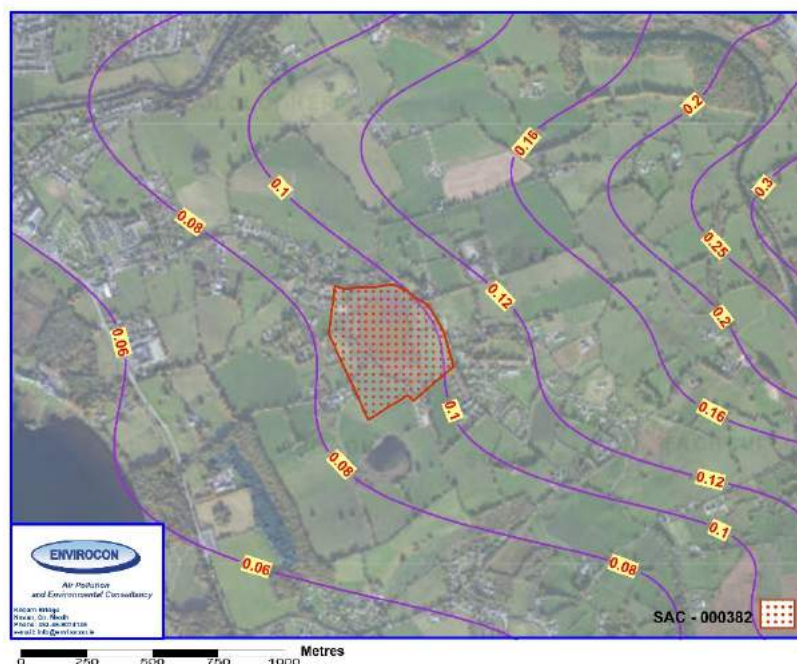


Figure 1: Predicted annual average NO<sub>x</sub> concentrations in the locality of Sheheree Bog due to maximum emissions from the asphalt plant. ( $\mu\text{g}/\text{m}^3$ )

In order to confirm that predicted annual nitrogen deposition rates in the locality of the SAC will also be very low, the ADMS5 model was run to predict annual Nitrogen deposition rates due to maximum NO<sub>x</sub> emissions from the plant exhaust stack. The NO<sub>x</sub> annual deposition rate is given as kg of Nitrogen (N) per hectare (kgN/ha/yr) (Figure 3). The rate of deposition is related to the concentration in the plume and dry deposition velocity of NO<sub>2</sub>, since deposition of NO will be negligible within this distance downwind.

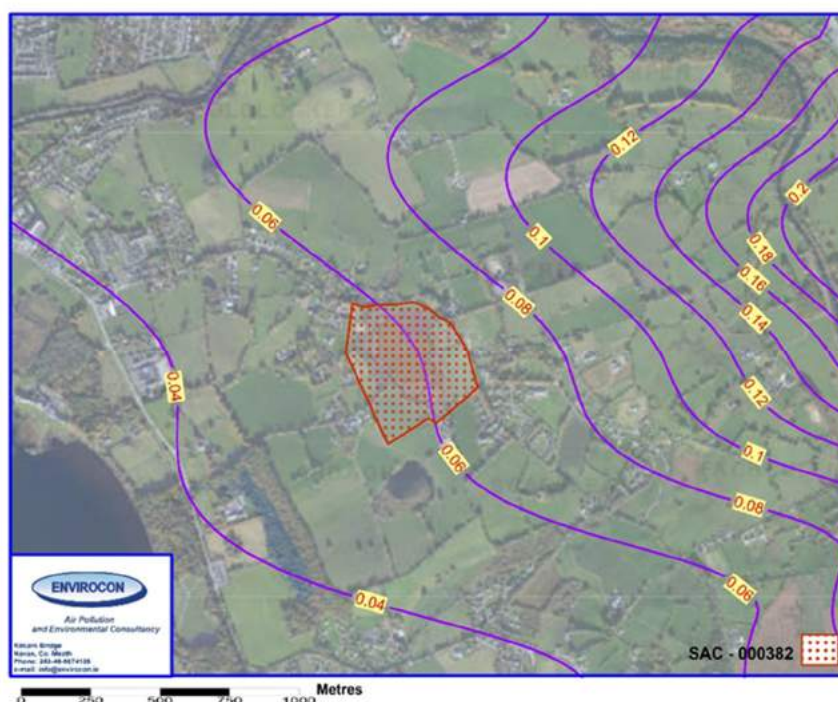
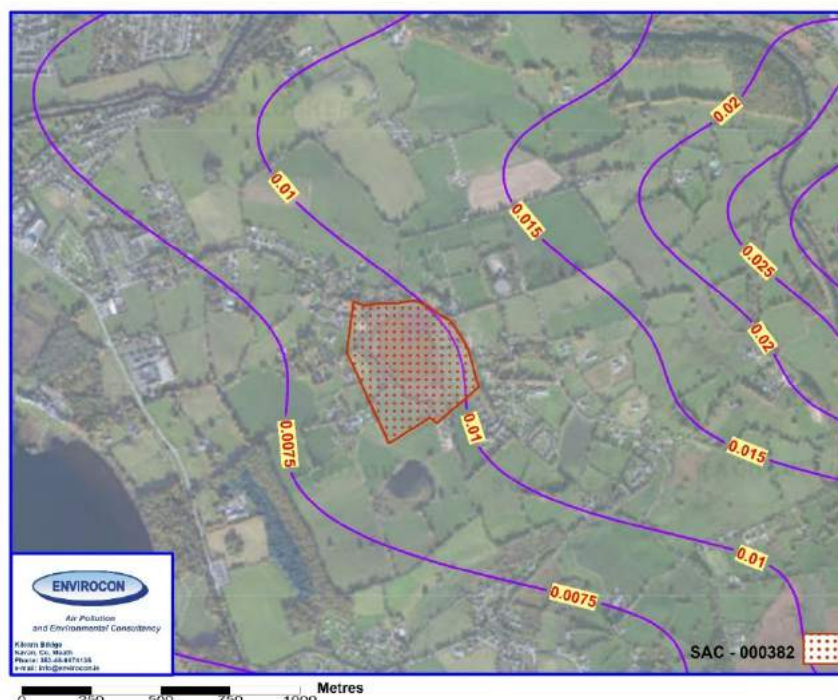


Figure 2: Predicted annual average SO<sub>2</sub> concentrations in the locality of Sheheree Bog due to maximum emissions from the asphalt plant. ( $\mu\text{g}/\text{m}^3$ )



**Figure 3: Predicted annual N deposition rates in the locality of Sheheree Bog due to emissions from the asphalt plant. (kgN/ha/yr)**

The predicted rate of 0.01 kg N/ha/yr is 0.2% of the lower critical load conservation target of 5 kg N/ha/yr specified for Sheheree Bog by the National Parks and Wildlife Service (NPWS). The critical load relates to the long-term potential effects of pollutant deposition and is defined as “*a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge*”. An increment of 1% or less of the relevant annual critical load alone is considered inconsequential (IAQM 2019).

The European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL)<sup>(5)</sup> set the *de minimis* value for contributions to dry deposition of nitrogen at 0.3 kg/ha/yr. The IMPEL guidance states, below this deposition rate contributions “*cannot be realistically attributed to a particular project they should rather be described as diffuse part of the background deposition*”. Both thresholds above are very low and thus in line with the precautionary approach prescribed by the Habitats Directive.

As such the level of ambient change in annual N deposition associated with the proposed asphalt plant is not likely to be discernible from ambient measurements or fluctuations in the background annual rate.

### 3.0 Critical Load Objective

#### 3.1 Conservation Objective for Sheheree SAC (NPWS)

The range in the annual Nitrogen deposition target of 5 kgN/ha/yr is the lower limit of the critical load value appropriate for raised bogs that is given in the conservation objectives (CObj) of between 5-10 kgN/ha/yr for Sheheree SAC. This range, as a target objective, was developed in



2011 and was standard throughout Europe irrespective of differences of climatic zone. However, the appropriate target value for annual rate of N deposition for ecologically sensitive areas is also associated with whether the site is within a region of high or low rainfall. In the COBj support document available on the NPWS web-site the approach in selecting an appropriate critical load value relevant to annual rainfall occurring at the SAC site is mentioned. The COBj support document states that the critical load at the high end of the range of 5-10 kgN/ha/yr should be applied to the Sheheree Bog SAC. However, the precautionary approach in the air quality (N deposition) objective adopted the site-specific target of the air quality surrounding the bog close to natural reference conditions with total annual N deposition rate of 5 kgN/ha/yr.

### **3.2 Interpretation of Conservation Objective values**

The Conservation Objectives for the Sheheree SAC gives a rate of N deposition above the upper critical load value of 11.4 kgN/ha/yr, with a reference to the Henry & Aherne <sup>(6)</sup> study. This study derived spatial estimates of total N deposition in Ireland to determine the extent and magnitude of exceedance of critical loads and Natura 2000 protected grasslands. The approach was to disaggregate estimates of annual oxidised nitrogen (as N) and reduced N (ammonia (NH<sub>3</sub>) deposition based on the European EMEP<sup>(7)</sup> data for Ireland. Prior to 2016, the EMEP programme modelled total annual N deposition rates using a spatial grid size of 50km x 50km and H&A2014 disaggregated these to 5km x 5km grid squares to estimate the local N impacts. In addition, they used long-term annual precipitation data from Valentia and applied the rates and precipitation chemistry within these grid squares. Annual N deposition rates across the whole of Ireland were then calculated.

Their approach used macro-scale atmospheric chemistry modelling to calculate micro-scale N deposition impacts. Such an approach should be viewed with caution in using specific N deposition values for small areas. This is especially the case where the total area of interest, such as the Sheheree bog locality is substantially less than 25km<sup>2</sup>.

Furthermore, from a review of the Henry & Aherne 2014 publication, there is no detail on how the critical load of 11.4 kg/h/y value for Sheheree Bog was calculated. Other SAC data for bogs available on the NWPS web-site give a wide variation in values, such as Ardriague Bog SAC (SAC002356)<sup>(8)</sup> near Banagher gives a value in the Conservation Objectives for this raised bog of 12.3 kgN/ha/yr and Tullaghanrock Bog SAC (SAC002354)<sup>(9)</sup> near Ballinhadereen gives a corresponding COBj value of 8.4 kgN/ha/yr. The calculations of annual N deposition at various sites in Ireland are given in the Conservation Objectives that references the Henry & Aherne 2014 study. These data-sets with this degree of accuracy in deposition rates are not available and so it is not possible to confirm how such rates were calculated from the study.

However, such accuracy is not possible based on the limitations of the EMEP model, limited spatial accuracy of land-use, emissions, atmospheric chemistry and in the case of ammonia emission impacts, live-stock densities and farming practices. It should be noted that even the latest EMEP modelling reports of annual N deposition rates give ranges in mapping results of annual deposition rates equivalent to 5-10 KgN/ha for the lower deposition categories with a range width of >50 KgN/ha for higher deposition categories.

The Conservation Objectives supporting documents for SACs for bogs that were reviewed on the NWPS web-site included the following paragraphs:-

*The critical load applied to peatland ecosystems by Aherne & Farrell (2000) was 10kg N/ha/yr. This is in line with the recommendation by Bobbink & Hettelingh (2011) that the critical load should be set at the high end of the range in areas of high precipitation and at the low end of the range in areas of low precipitation assuming that Ireland represents a high precipitation area.*

*It is recommended in the case of Sheheree Bog that the level of N deposition should not exceed the low end of the range i.e. 5kg N/ha/yr. This recommendation is based on a precautionary approach, as the evidential basis for setting a higher level is not particularly strong as alluded to by Payne (2014). Total N deposition in the vicinity of Sheheree Bog as reported by Henry & Aherne (2014) is 11.4kg N/ha/yr.*

The first paragraph mentions setting the critical load at the high end of the range as the Killarney area is within a high precipitation area. However, it is the final paragraph that dismisses this approach in recommending the lower end of the range, ie. 5 kgN/ha/yr should be used in Ireland for raised bogs. The adoption of a precautionary approach references a UK based report by Payne (2014)<sup>(10)</sup>. This was a study of the exposure of British peatlands to nitrogen deposition based on atmospheric chemistry studies undertaken during the 1990s-mid 2000s. These studies were related to conditions where significant deposition of both S and N were occurring in upland areas of England, with much of the deposition taking place as acid rain from sulphate aerosol. Wet N deposition was due to emissions from both the major power stations and other large industries as well as trans-boundary sources in the major industrial areas of Europe. This resulted in N deposition at a number of peat bogs well above the upper critical load of 10 kgN/ha/yr with rates of 15 kgN/ha/y in many locations where sensitive bog species were present.

This serious deposition scenario for the UK in the Payne report is not representative of patterns occurring in Ireland, especially in western counties, where the prevailing weather is due to westerly Atlantic cyclonic systems with associated high rates of precipitation. This synoptic weather pattern results in much lower rates of N wet deposition rates and therefore deposition loading in ecologically sensitive areas compared to the situation prevailing 10-20 years ago in the UK. The impact of emissions from power stations and large industries was of an order of magnitude greater compared to the major emission sources in Ireland. For example, emissions during the 1990's from just one power station in the UK Midlands was greater than the total NO<sub>x</sub> emitted from all sources in Ireland.

### **3.3 Annual N deposition update**

The Conservation Objectives for the Sheheree SAC gives a rate of N deposition above the upper critical load value of 11.4 kgN/ha/yr, with a reference to the Henry & Ahearne 2014 study. However, more recent results from modelling emissions and atmospheric chemistry using 2018 data are available. The 2020 report available from EMEP<sup>(11)</sup> provide statistics on emission and deposition rates for annual oxidised N, RedN and S in Ireland for 2018. These are presented as maps of annual deposition rates based on a fine-scale gridding for modelling the contribution of emissions from Ireland to N deposition and also trans-boundary contributions to the total annual deposition. These maps include results for N and reduced N (NH<sub>3</sub>) deposition. The trend since

2000 in terms of annual oxidised N deposition is a reduction from 21,000 tonnes in 2000 by 38% to 13,000 tonnes in 2018. In comparison, the trend in NH<sub>3</sub> emissions shows a very small change in NH<sub>3</sub> emissions over these years, increasing by 2% from 42,000 tonnes in 2000 to 43,000 tonnes in 2018.

Since the primary source of NH<sub>3</sub> deposition in Ireland is attributed to agricultural emissions with insignificant levels from burning fossil fuels it is evident that control of emissions from this sector is the main factor in reducing potential long-term total N deposition impacts at raised bogs in Ireland. Furthermore, the results from the 2020 EMEP report indicate that annual oxidised N deposition in the Kerry area is estimated at 1-2 kgN/ha/yr, with trans-boundary N wet deposition approximately 60-70% of the annual deposition. In terms of annual RedN deposition rates, the annual rate is estimated at about 2-3 kgN/ha/yr, with below 20% from trans-boundary sources.

This estimate for annual total N deposition is significantly lower than the 11.4 kgN/ha/yr referenced in the NPWS conservation objectives for Sheheree bog SAC.

### **3.4 Cumulative Impact**

The main pollutants from traffic emissions which are of concern for ecology are nitrogen oxides (NO<sub>x</sub>), together with the acidification and eutrophication associated with acid and nitrogen deposition on sensitive ecosystems that can occur when these substances are deposited to land at high rates. Although environmental standards for the protection of vegetation and ecosystems include sulphur dioxide (SO<sub>2</sub>), this parameter from traffic emissions is negligible and is not of concern near roads.

High rates of nitrogen deposition upon sensitive ecosystems can increase the eutrophication of soils and water and have a detrimental effect on species-rich plant communities and semi-natural habitats that are often associated with a low nutrient status. Eutrophication can decrease species diversity and the dominant plant species can change to those better to respond to increased nitrogen levels.

Transport Infrastructure Ireland guidance<sup>(12)</sup> indicates that detailed consideration need only be given to emissions to air where there is a significant change to traffic flows (>5%) and a designated site lies within 200m of the road centre line. In relation to the proposed asphalt plant development the following is noted (refer to Plan File Ref. No. 10/1163):

- The proposed development will result in an additional 37 trips daily of which 90% will be HGVs. The increase in traffic as a percentage of the current flows on the N22 is 2.2% northbound and 0.73% southbound.
- Sheheree Bog SAC lies 1.7 km to the west of the N22 national secondary road.

It is considered therefore that any changes in air quality from traffic emissions will have no measurable effects on any habitats and vegetation within Sheheree Bog SAC, or on the integrity of this designated site. As such potential cumulative impacts from traffic associated with the development can be screened out.

Agricultural emissions of NH<sub>3</sub> emissions from live-stock, especially from cattle herds, are recognised as a major contributor to overall N deposition rates in Ireland. The 2020 State of the Environment report by the EPA<sup>(13)</sup> estimates that emission from farming account for 99% of National NH<sub>3</sub> emissions with an annual rate of 119,000 tonnes in 2018. The majority of NH<sub>3</sub>

emissions are deposited as dry deposition within the surrounding area where live-stock farming is taking place. There are negligible NH<sub>3</sub> emissions from burning oil and other fossil fuels.

The results of the modelling study undertaken for the proposed asphalt plant emissions demonstrate that the contribution of such emissions to total annual N deposition rates within the locality of the Sheheree Bog SAC is predicted as imperceptible and well below 1% of the lower critical load value of 5 kgN/ha/y.

### **3.5 Likelihood of Significant Effects on Natura 2000 Sites**

NPWS (2010) <sup>(13)</sup> guidance for planning authorities states *“If the effects are deemed to be significant, potentially significant, or uncertain, or if the screening process becomes overly complicated, then the process must proceed to Stage 2 (AA). Screening should be undertaken without the inclusion of mitigation, unless potential impacts clearly can be avoided through the modification or redesign of the plan or project, in which case the screening process is repeated on the altered plan. The greatest level of evidence and justification will be needed in circumstances when the process ends at screening stage on grounds of no impact.”* This approach is adopted in this report to appraising likely significant effects of the proposed project.

A significant effect is defined in paragraph 49 of the Waddenzee Case C-127/02 (<https://curia.europa.eu/juris/showPdf.jsf?text=&docid=49452&doclang=EN>) as follows *“..... pursuant to the first sentence of Article 6(3) of the Habitats Directive, 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 inter alia of the characteristics and specific environmental conditions of the site concerned by such a plan or project.”*

In the Judgement of Ms. Justice Niamh Hyland delivered on 15 January 2021 IEHC 16 Record Number 2018 740 JR; Justice Hyland refers to the findings of Advocate General Sharpston in *Case C-258/11 Sweetman v. An Bord Pleanala* ECLI:EU:C:2012:743 at paragraph 47 to 49 are of relevance, and state as follows:

*“47. It follows that the possibility of there being significant effect on the site will generate the need for an appropriate assessment for the purposes of Article 6 (3). The requirement at this stage that the plan or project be likely to have a significant effect is thus a trigger for the obligation to carry out an appropriate assessment. There is no need to establish such an effect; it is as Ireland observes, merely necessary to determine that there may be such an effect.*

*48. The requirement that the effects in question will be “significant” exists in order to lay down the de minimus threshold. Plans or projects that have no appreciable effect on the site are thereby excluded. If all plans or projects capable of having any effect whatsoever on the site were to be caught by Article 6 (3), activities on or near the site would risk being a possible by reason of legislative overkill.’*

As demonstrated above, the proposed project is not likely to result in any significant effects on Sheheree Bog SAC and as a result there is no risk of undermining the conservation objectives of the SAC. There are no uncertainties or gaps in information to reach this conclusion.



#### **4.0 Proposed Mitigation measures**

As the proposed project is not likely to result in any significant effects on Sheheree Bog SAC no specific additional mitigation measures are proposed or required to reduce or avoid impact at the Sheheree Bog SAC, or any other Natura 2000 Site within the area.

#### **5.0 Conclusion**

In the long-term, the EU's objective in relation to Article 6 of the Habitats Directive is to have non-exceedance of the critical load for Nitrogen deposition in all European ecosystem areas. However, the sum of the annual N deposition load within a specific country and within areas of that country are the cumulative loading from dry deposition and wet deposition rates of oxidised N and Reduced N ( $\text{NH}_3$  &  $\text{NH}_4$ ). These 2 fundamental atmospheric process pathways have distinct characteristics. Dry deposition is a local pathway, whereas wet deposition is predominantly a long-range pathway process. Total nitrogen dry deposition loading in an area comprises  $\text{NO}_x$  from local sources burning fossil fuels and  $\text{NH}_3$  from agricultural sources deposited from the emission plume as it travels downwind. Wet deposition is the large-scale pathway where emissions from an exhaust stack are mixed within the cloud layer as it travels hundreds of kilometres from the emission source. As the trans-boundary emissions are mixed in the cloud the  $\text{NO}_x/\text{NO}_2$  is converted into secondary pollutants to form nitrate aerosols within the cloud water droplets before falling as precipitation to the ground.

In the eastern region of Co. Kerry, the annual rate of N deposition (oxidised N and Reduced N) is estimated to be 3-5 kgN/ha/yr. Dry deposition of  $\text{NO}_x$  contributes only a small percentage of total annual oxidised N, with wet deposition originating from trans-boundary sources including from the Atlantic, estimated to account for 60-70% of the annual total. In contrast, over 80% of the total Reduced N deposition, is estimated to be as  $\text{NH}_3$  dry deposition from agricultural sources within the area.

The Conservation Objectives in relation to potential impacts of atmospheric emissions at Sheheree SAC specify a current annual nitrogen deposition of 11.4 kgN/ha/yr and that the target value is 5 kgN/ha/yr.

It has been demonstrated in this response that the predicted long-term impact of emissions from the asphalt plant will have a negligible impact at this SAC. However, there is a predicted addition of 0.01 kgN/ha/y based on the dry N deposition modelling study of the potential effects of the emissions from the asphalt plant exhaust stack. The quoted 11.4 kgN/ha/yr is an estimate based on a research publication published in 2014 that applied the disaggregation of atmospheric chemistry modelling results based on a 50km x 50km grid to a microscale of 5km x 5km grid in interpreting the spatial pattern of N deposition in County Kerry. Furthermore, the 11.4 kgN/ha/y is derived from historical emission and atmospheric chemistry data that does not reflect current N deposition rates in the county. The results based on the latest atmospheric chemistry models demonstrate that there has been a substantial reduction in the annual dry and wet deposition of N since this value was calculated, both in terms of the estimated contribution from emission sources within Ireland and also contribution from trans-boundary sources.

Within the locality of Sheheree Bog SAC, NH<sub>3</sub> emissions are estimated to be the primary source of total annual N deposition rates at the SAC and this should be recognised in determining whether the Conservation Objective regarding air quality impacts for the SAC are achievable.

The predicted annual concentration level and deposition load at Sheheree Bog SAC due to emissions from the proposed asphalt plant is less than 1% of the annual NO<sub>x</sub> NAQS and the critical load conservation target of 5 kg N/ha/yr specified for raised bog ecological areas. As such, oxidised N concentration or deposition rates due to emissions from the proposed development will have no perceptible effect within the SAC. Emissions of NH<sub>3</sub> are negligible from the operation of the asphalt plant. Therefore, based on the evaluation of the additional concentration level and deposition loading from the plant emissions, this demonstrates that the proposed project does not pose a risk of likely significant effects on the SAC.

The results of this detailed assessment of potential ambient and deposition effects likely at the Sheheree Bog SAC determine that appropriate assessment of the proposed asphalt plant is not required, as the proposed project, individually or in combination with other plans or projects, will not have a significant effect on any Natura 2000 sites.

ITEM 2:

The applicant should confirm that the information and conclusions provided on the use of terrain data in the air quality modelling exercise are also applicable to the odour modelling exercise undertaken in this instance.

*Response*

The results of the odour impact modelling exercise without and with terrain are given below:-

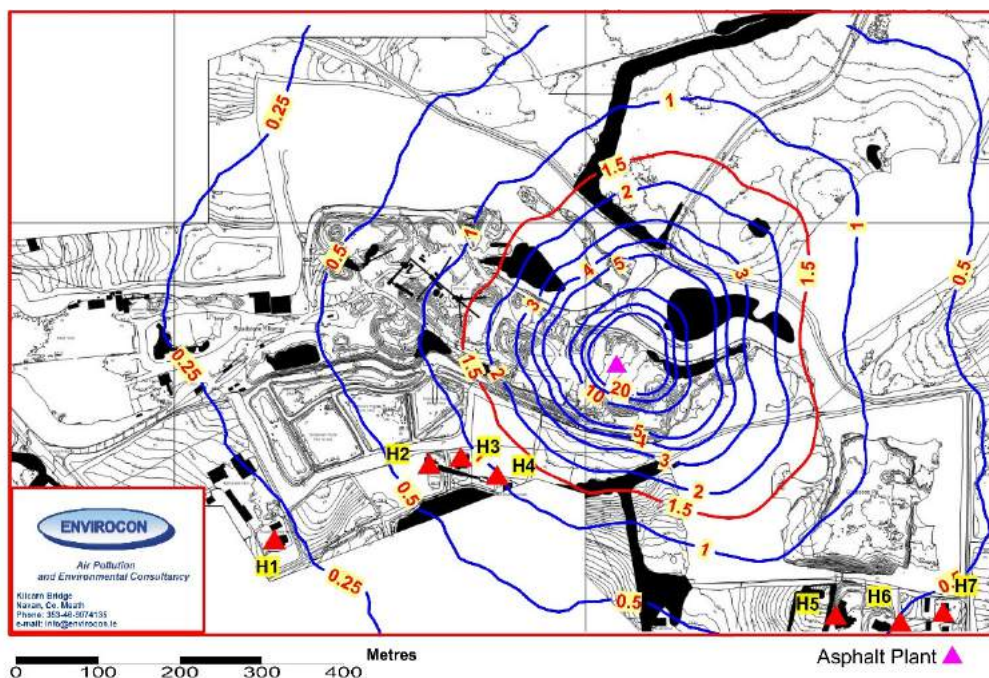


Figure 4: Predicted 98% odour concentrations – without terrain

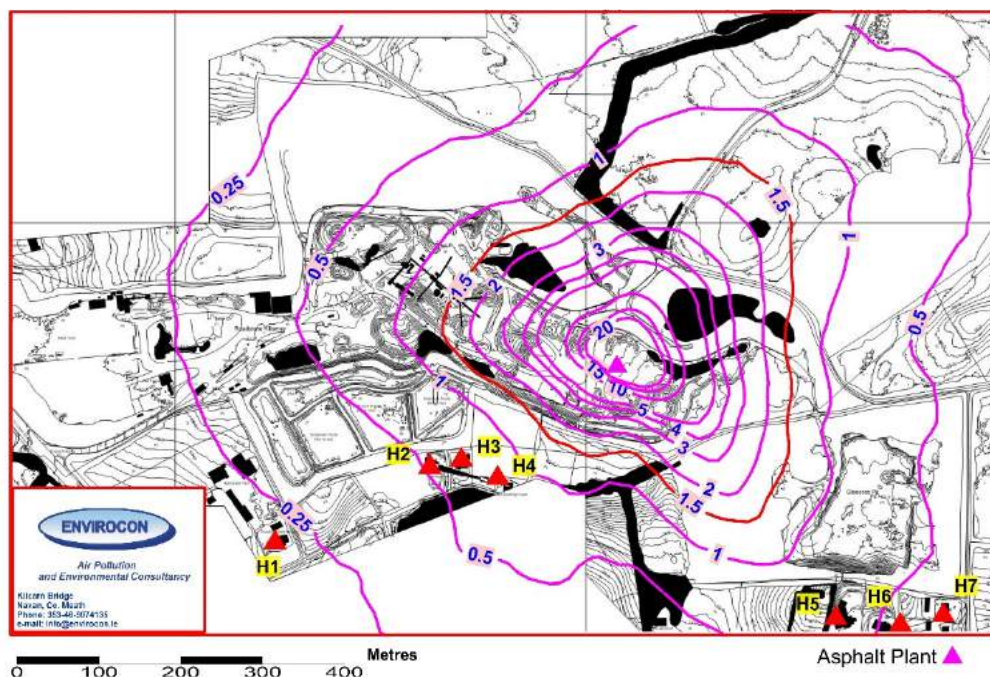


Figure 5: Predicted 98% odour concentrations – with terrain

Comparison of the predicted 98% odour concentrations between the 2 terrain modelling options, demonstrate that there is no significant difference in the magnitude or spatial extent in the predicted odour concentration contours. In addition, there is no significant change in predicted odour levels at the nearest houses to the quarry site between the 2 options.

This evaluation exercise confirms that the local topography is not a significant air dispersion modelling parameter in determining the predicted potential extent of odours from the operation of the asphalt plant. Therefore, the results submitted in the February report are an appropriate assessment of likely air quality impacts beyond the quarry boundary.

It is confirmed that the information provided on the use of terrain data in the air quality modelling exercise (FI Item 6 of February submission) are also applicable to the odour modelling study submitted in the Envirocon report of 4<sup>th</sup> February 2021.

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- (3) Government Publications, 2011, Air Quality Standards, Air Quality Standards Regulations, Stationary Office, Dublin
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- (10) Payne, 2014, The exposure of British Peatlands to nitrogen deposition, 1900-2030, Mires and Peat, Vol 14.
- (11) Klein, Gauss et Al, 2020, Transboundary air pollution by sulphur, nitrogen, ozone and particulate matter in 2018- Ireland
- (12) National Roads Authority, 2011, Guidelines for the treatment of air quality during Planning and Construction of National Road Schemes, Appendix 9, NRA
- (13) EPA, 2020, Ireland's Environment - An Integrated Assessment, Wexford

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## APPENDIX B

Envirocon (2022): EPA Air Emissions Licence Appeal (AP-20-01): Addendum Report Relating to Appropriate Assessment Notice for Operation of Asphalt Plant Roadstone Ltd. Clasheen, Killarney, Co. Kerry

**EPA AIR EMISSIONS LICENCE APPEAL**  
**(AP-20-01)**  
**ADDENDUM REPORT RELATING TO**  
**APPROPRIATE ASSESSMENT NOTICE**  
**FOR**  
**OPERATION OF ASPHALT PLANT**  
**ROADSTONE LTD.**  
**CLASHEEN**  
**KILLARNEY, CO. KERRY**

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Date	02/06/2022



## 1.0 Introduction

Kerry County Council received an application for an air emissions licence in 2020 for the planned asphalt plant at the Roadstone quarry in Clasheen. As part of the evaluation process a request for clarification was issued in February 2021 to Roadstone Ltd. relating to assessing the potential effect of emissions at Natura 2000 sites in the area. A detailed report was prepared by Envirocon<sup>(1)</sup> and submitted to Kerry County Council in March 2021. This report examined the significance of potential effects at Sheheree (Ardagh) Bog SAC both in terms of long-term environmental loading on critical levels of NO<sub>x</sub> and SO<sub>2</sub> concentrations and nitrogen deposition rates.

The assessment screening study included air quality modelling of the plant emissions to evaluate the spatial pattern of NO<sub>x</sub> and SO<sub>2</sub> annual average concentrations (µg/m<sup>3</sup>) and N deposition rates (kgN/ha/yr) due to maximum permitted emissions from the asphalt plant. The lower limit of the critical load value appropriate for raised bogs specified in the Conservation Objectives (CO<sub>bj</sub>) is 5 kgN/ha/yr<sup>(2)</sup> and this was used in the assessment. The study concluded that the predicted impact of emissions from the asphalt plant will have an imperceptible contribution on existing air quality and nitrogen (N) deposition at the Sheheree Bog SAC. The additional loading was calculated to be equivalent to less than 1% of the annual NO<sub>x</sub> and SO<sub>2</sub> National Air Quality Standards (NAQS)<sup>(3)</sup> and the CO<sub>bj</sub> specified for raised bog ecological areas. Therefore, It was determined that an Appropriate Assessment (AA) was not required.

An air emissions licence (AP-20-01) was granted by Kerry Co. Council in May 2021 that was subsequently appealed by local residents to the EPA. Following a review in April 2022 by the EPA as part of the appeal determination, a Public Notice for a full Appropriate Assessment of potential air quality effects at 3 SAC/SPA's was published on 5<sup>th</sup> May. The 3 European sites near Clasheen listed in the Notice are the Sheheree Bog SAC, Killarney National Park, Macgillycuddy Reeks and Caragh River Catchment SAC, and Killarney National Park SPA.

The following report is an Addendum to the 2021 appropriate assessment screening study of the Sheheree Bog SAC and includes a similar approach to assessment of potential emission effects at the other 2 European sites.

## 2.0 Professional Experience

The 2021 study and this response has been undertaken by Michael Bailey, Managing Director of Envirocon, who has over 30 years' experience as an air quality consultant. This includes licencing of asphalt plants throughout Ireland and has carried out modelling studies for many of the plants installed in quarries and for motorway and other major infrastructural projects over the past 20 years. He has carried out ecological assessments of air emissions and community effects of a wide range of industrial activities including power plants, pharmaceutical, food and dairy plants. He is an expert in atmospheric emissions and during the 1980's carried out the first major investigation of acid deposition and long-range air pollution effects in Ireland.



### 3.0 Asphalt Emission Characteristics

#### 3.1 Exhaust Stack Parameters

The characteristics for the exhaust stack of the asphalt plant that were submitted in the 2020 licence application and used to model potential long-term effects at the Sheheree Bog SAC are presented in Table 1. The exhaust flow rate at maximum plant output is 56,000 Nm<sup>3</sup>/h, which equates to an exit velocity of 22.4m/s based on a 1.1m diameter stack.

**Table 1: Characteristics of the exhaust stack**

Parameter	Stack Ht (m)	Diameter (m)	Exhaust vol (Nm <sup>3</sup> /h) <sup>(i)</sup>	Actual vol (m <sup>3</sup> /h) <sup>(ii)</sup>	Exit T. (°C)	Exit Vel (m/s)
Exhaust Stack	15.0	1.1	56,000	76,520	100	22.4

Note: (i) Wet as discharged at STP Reference T=0°C) (Nm<sup>3</sup>/h); (ii) Actual exhaust volume (m<sup>3</sup>/h).

#### 3.2 Licence Application Emission Limit Values

The emission limit values and corresponding emission rates for Nitrogen Oxides (NO<sub>x</sub> as NO<sub>2</sub>) and Sulphur Dioxide (SO<sub>2</sub>) provided in Table 2 were used in calculating annual emission rates for the 2021 Appropriate Assessment. These rates represent a maximum hourly emission scenario with the NO<sub>x</sub> and SO<sub>2</sub> emissions modelled at 6.1 g/s and 4.8 g/s.

**Table 2: Emission Limits and Maximum Rates**

Parameter	Emission Limit Value (mg/Nm <sup>3</sup> )	Emission (kg/h)	Emission (g/s)
Nitrogen Oxides (as NO <sub>2</sub> )	450	22.1	6.1
Sulphur Dioxide (SO <sub>2</sub> )	350	17.2	4.8

#### 3.3 Revised Emission Limit Values

Licence AP-20-01 specifies identical emission limit value concentrations in the Appendix that relate to permitting combustion of gas oil and 11LS re-processed fuel oil in the rotary dryer burner unit. However, emission measurements obtained from numerous asphalt plants in Ireland in recent years demonstrate that the NO<sub>x</sub> and SO<sub>2</sub> emission concentrations in the stack exhaust are generally well below 350 and 250 mg/Nm<sup>3</sup> respectively.

In order that representative maximum emission rates are applied to the Appropriate Assessment for the 3 European sites the maximum concentrations present in the exhaust air can be reduced significantly below the limit values used in the 2021 study. The amended maximum or worst-case emissions used in the updated modelling exercise in Section 4 below are based on emission rates given in Table 3.

**Table 3: Emission Limits and Maximum Rates**

Parameter	Emission Limit Value (mg/Nm <sup>3</sup> )	Emission (kg/h)	Emission (g/s)
Nitrogen Oxides (as NO <sub>2</sub> )	350	19.6	5.4
Sulphur Dioxide (SO <sub>2</sub> )	250	14.0	3.9

## **4.0 ASSESSMENT OF AIR IMPACTS AT SAC/SPAS**

### **4.1 Model Overview**

The ADMS5<sup>(4)</sup> air quality dispersion model was used to predict long-term impacts of NO<sub>x</sub>, SO<sub>2</sub> and N deposition using an extensive receptor grid (75x75 points) extending over an area of 7.5km west-east and 6.0km south-north. This receptor grid provided predicted values at a spacing of 95m x 45m westwards from the quarry to Lough Leane and so includes the eastern boundary of the Killarney National Park SPA.

The approach used in the deriving emission rates was identical to that used for the 2021 study, with the stack emission characteristics and weekly emission pattern used to represent a worst-case emission scenario. The plant was modelled with full production during the hours of 07:00-19:00 hours Monday- Saturday. For the remaining hours the emission rate was set at zero.

Climatological data from the meteorological station at Cork Airport (68km to SE) of Clasheen were used in predicting the ground level pollutant concentrations in the locality of the quarry. Hourly climatological datasets for the years, 2018-2021<sup>(5)</sup>, for wind speed, wind direction, air temperature and cloud cover, were processed to generate wind field data and hourly atmospheric stability conditions.

### **4.2 Predicted Air Quality Impacts**

#### **4.2.1 Ambient concentration load**

Annual average NO<sub>x</sub> and SO<sub>2</sub> ground level concentrations were predicted with the ADMS5 dispersion model at the 3 conservation sites and compared with the annual NAQS or critical level for the protection of the ecosystems, which are 30 µg/m<sup>3</sup> and 20 µg/m<sup>3</sup>, respectively for these 2 air pollutants. This provides an indication of potential air quality impacts on the ecology within the areas. The IAQM guidance document<sup>(6)</sup> recommends a lower annual critical level for SO<sub>2</sub> of 10 µg/m<sup>3</sup> to be used as a critical level for lichens, mosses and other raised bog species.

The total environmental loading in terms of air quality impact is referred to as the Predicted Environmental Concentration (PEC). This parameter is the total impact of emissions from the asphalt plant exhaust stack, (Process Contribution or PC) combined with the long-term background concentrations, so that the cumulative impact can be compared with the NAQS values.

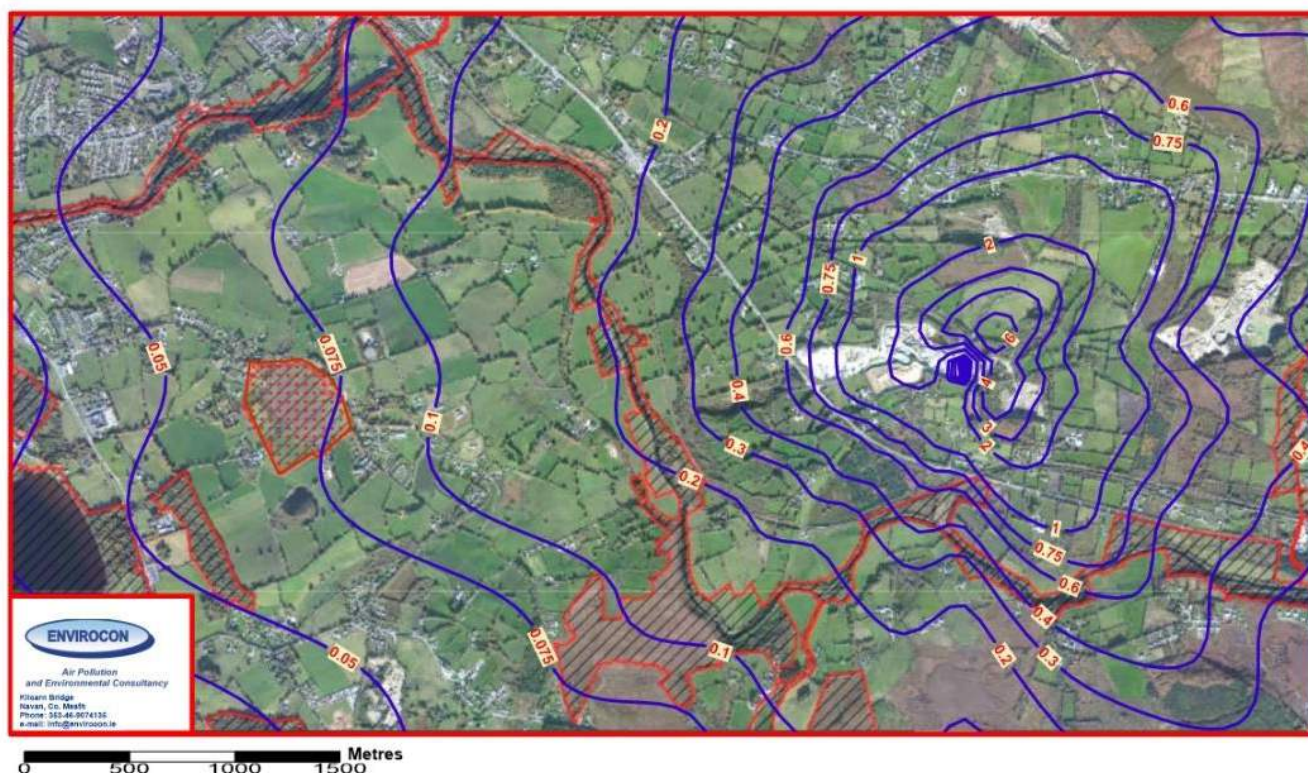
There are no other significant industrial emission sources nearby, and so background levels in the surrounding area are well below the NAQS values. Annual concentrations at the conservation sites will be comparable to background locations measured elsewhere in Ireland. Results published by the EPA for annual ambient air quality during 2018-20<sup>(7)</sup> at rural monitoring locations in Ireland give annual average NO<sub>x</sub> concentrations of 2-8 µg/m<sup>3</sup>. Rural background concentrations of SO<sub>2</sub> during the same period were <1-2 µg/m<sup>3</sup>. At the Sheheree Bog SAC and the Killarney National Park SAC/SPA sites the background annual concentrations for NO<sub>x</sub> and SO<sub>2</sub> will typically be <2 µg/m<sup>3</sup> at locations well-removed from National or County Roads.

Predicted annual concentrations for NO<sub>x</sub> and SO<sub>2</sub> due to maximum emissions from the exhaust stack at the asphalt plant within the surrounding area of the quarry site are shown as contour plots in Figures 1 and 2. The extent of the 3 SAC/SPA sites that are to the west of the quarry are included on the base-map.

**Table 5: Predicted annual air quality impact at SAC/SPA sites**

	Distance/Direction from asphalt plant (km)	Map Coordinates		NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )
SAC/SPA		X	Y	Annual Average <sup>(i)</sup>	Annual Average <sup>(i)</sup>
Sheheree (Ardagh) Bog SAC	2.9km to West	498525	588711	(<0.1) <2	(0.05) <2
Killarney National Park, McGillycuddy Reeks, Caragh River SAC	0.63km to South	501270	588105	(1) 10	(<1) 4
Killarney National Park SPA	3.5km to West	498025	588050	(<0.1) <2	(<0.1) <2
NAQS				30	20(10) <sup>(ii)</sup>

Note(i) Stack contribution (Process Contribution PC) in ( ), PEC = PC + background concentration (ii) 10 µg/m<sup>3</sup> Critical level for protection of lichens, mosses and other raised bog plant species

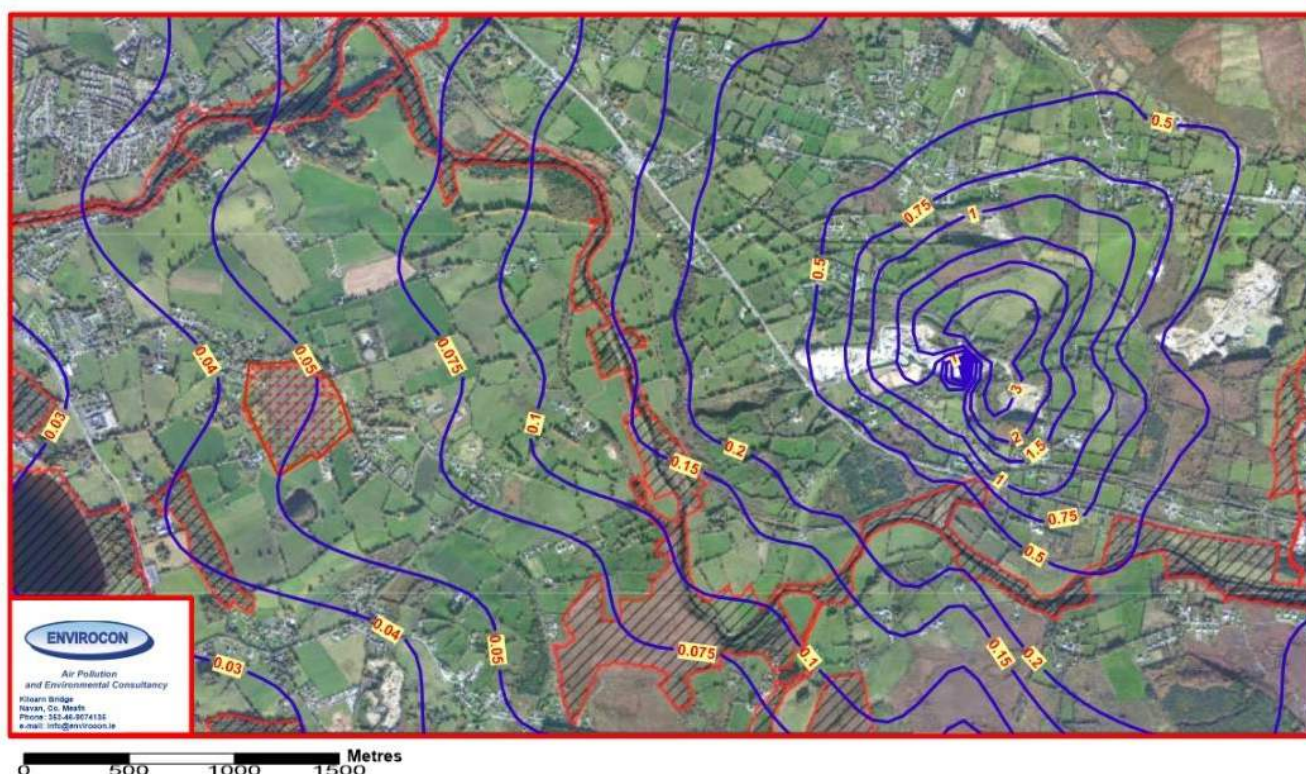


**Figure 1: Predicted annual average NO<sub>x</sub> concentrations due to maximum emissions from the asphalt plant. (µg/m<sup>3</sup>)**

The annual average NO<sub>x</sub> and SO<sub>2</sub> concentrations were predicted at the nearest boundary of each SAC/SPA with the distance and direction along with the ITM map coordinates of the modelled receptor given in Table 5. The contribution of the asphalt plant emissions to NO<sub>x</sub> and SO<sub>2</sub> long-term PEC values are very low and <0.1 µg/m<sup>3</sup> or <1% of the annual NAQS at the



Sheheree Bog SAC and Killarney National Park SPA. The NO<sub>x</sub> PEC and SO<sub>2</sub> PEC are less than 7% and 10% of the NAQS at locations distant from roads.



**Figure 2: Predicted annual average SO<sub>2</sub> concentrations due to maximum emissions from the asphalt plant. (µg/m<sup>3</sup>)**

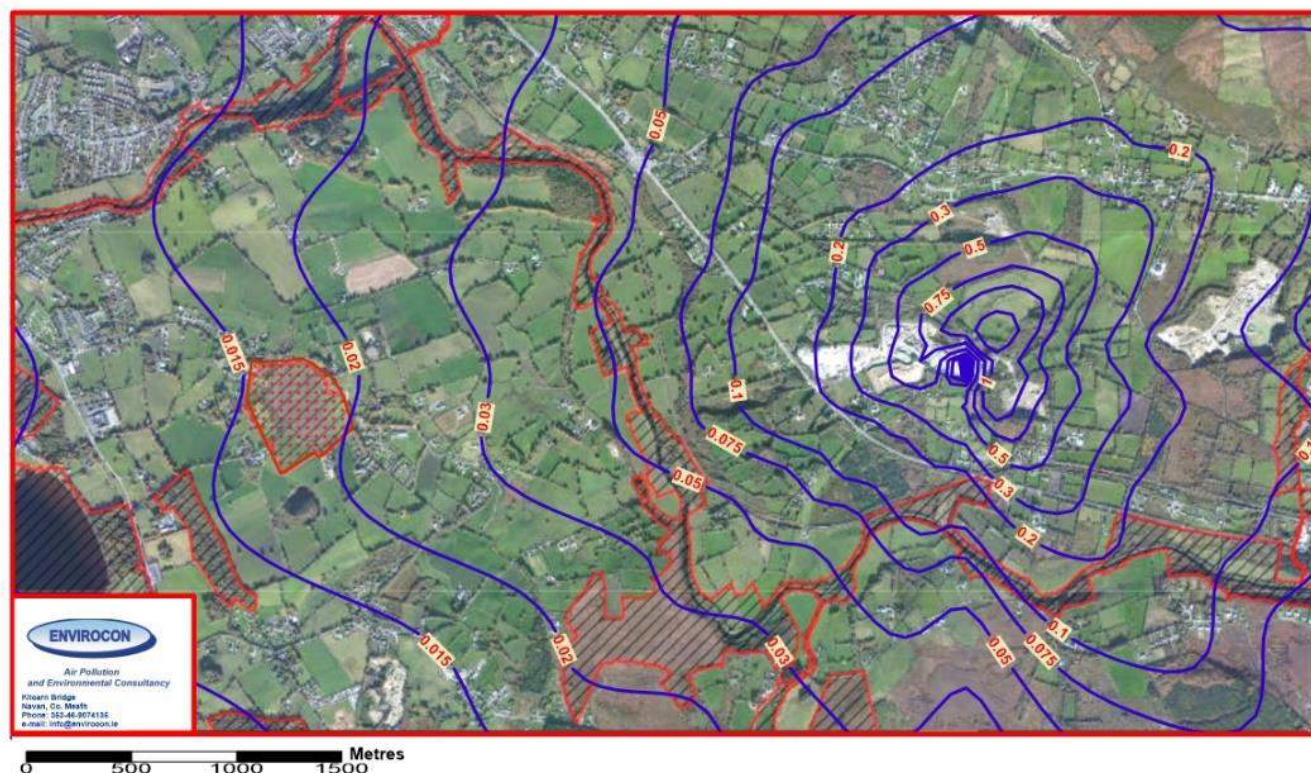
The nearest boundary of the Killarney National Park, Macgillycuddy Reeks and Caragh River Catchment SAC is 0.63km to the south of the asphalt plant site north of the River Flesk and runs along the boundary of the N22. The predicted contribution of NO<sub>x</sub> to annual concentrations near this boundary is 1 µg/m<sup>3</sup>, equivalent to 3% of the NAQS critical level. NO<sub>x</sub> emissions from traffic travelling along this roadway are the principal source within this section of the SAC. The predicted impact of SO<sub>2</sub> emissions from the plant at the SAC boundary is <1 µg/m<sup>3</sup>, equivalent to <5% of the annual NAQS. The corresponding annual SO<sub>2</sub> PEC is estimated at <4 µg/m<sup>3</sup> since emissions from traffic are very small, due to the negligible sulphur content of diesel and petrol with SO<sub>2</sub> from vehicle exhausts having no significant effect on road-side air quality outside major urban centres.

#### 4.2.2 Nitrogen Annual Deposition

The predicted annual nitrogen (N) deposition rate based on maximum NO<sub>x</sub> emissions from the asphalt plant at the revised hourly rate given in Table 2 are shown in Figure 3. The rate of deposition is related to the concentration in the plume and dry deposition velocity of NO<sub>2</sub>, since deposition of NO will be negligible within the locality of the asphalt plant.

There is a substantial rate of decrease in predicted rates from 0.3 kgN/ha/yr near the N22 westwards to the Sheheree Bog SAC where the predicted N deposition rate is <0.02

kgN/ha/yr. At the River Flesk the predicted N deposition rate is 0.1-0.2 kgN/ha/yr to the south and south-east of the quarry site and <0.1 kgN/ha/yr to the west and north-west of the quarry.



**Figure 3: Predicted annual N deposition rates due to maximum NO<sub>x</sub> emissions from the asphalt plant. (kgN/ha/yr)**

The results demonstrate that predicted long-term N deposition at the Sheheree Bog SAC and Killarney National Park SPA is 0.02 kgN/ha/yr or 0.4% of the lower limit for the CO<sub>bj</sub> of 5 kgN/ha/yr. Furthermore, apart from a small part of the boundary of the Killarney National Park, Macgillicuddy Reeks and Caragh River SAC bordering the N22 0.6km to the south of the asphalt plant site, the predicted N deposition along the River Flesk and further westwards is well below 0.1 kgN/ha/yr, equivalent to 2% of the conservation objective for these sites.

The impact of NO<sub>x</sub> emissions at all 3 sites is predicted to be imperceptible in relation to the additional loading of N deposition rates from the asphalt plant emissions. Even where the Killarney National Park, Macgillicuddy Reeks and Caragh River SAC borders a small section of the N22 within about 0.6km of the asphalt plant site, the impact of the asphalt plant emissions will be imperceptible compared to air quality impacts from traffic NO<sub>x</sub> emissions at this location.



## 5.0 CONCLUSION

An air quality impact assessment study was undertaken in March 2021 in response to a clarification request relating to Appropriate Screening Assessment at Sheheree Bog SAC as part of the licence submission to Kerry County Council. This study has been repeated taking into account the reduction in maximum hourly NO<sub>x</sub> and SO<sub>2</sub> emissions from the asphalt plant. Two other conservation sites to the west of Clasheen were also included as part of the screening determination. These are the Killarney National Park, Macgillycuddy Reeks and Caragh River Catchment SAC and the Killarney National Park SPA as listed in the EPA Screening Determination Notice.

The emission scenario used in the air quality modelling exercise at each of the SAC/SPA sites is conservative and a 'worst-case emission scenario' in that it is based on maximum continuous emissions of NO<sub>x</sub> and SO<sub>2</sub> during the day-time permitted hours, 6 days a week throughout the year. Furthermore, the hourly emission rates are based on maximum concentrations in the stack exhaust of 350 mg/Nm<sup>3</sup> for NO<sub>x</sub> and 250 mg/Nm<sup>3</sup> for SO<sub>2</sub>. These emission limit values are substantially higher than normally measured at modern plants.

The results of the updated modelling study demonstrate that both the additional loading on ambient concentrations of NO<sub>x</sub> and SO<sub>2</sub> and deposition of N at each of the sites due to emissions from the asphalt plant are determined as insignificant. A summary of the predicted impacts at the boundary of the 3 sites nearest to the asphalt plant are provided in Table 7.

**Table 7: Predicted annual air quality impact at SAC/SPA sites**

	Distance/Direction from asphalt plant (km)	NO <sub>x</sub> (µg/m <sup>3</sup> )	SO <sub>2</sub> (µg/m <sup>3</sup> )	N Deposition (kgN/ha/yr)
SAC/SPA		Annual Average <sup>(i)</sup>	Annual Average <sup>(i)</sup>	Annual
Sheheree (Ardagh) Bog SAC	2.9km to West	(<0.1) <2	(0.05) <2	0.02
Killarney National Park, Reeks & Caragh River SAC	0.63km to South	(1) 10	(<1) 4	0.3
Killarney National Park SPA	3.5km to West	(<0.1) <2	(<0.1) <2	<0.02
NAQS/Critical Load		30	20 (10) <sup>(ii)</sup>	5

Note <sup>(i)</sup>Stack contribution (Process Contribution PC) in ( ), PEC = PC + background concentration : <sup>(ii)</sup>10 µg/m<sup>3</sup> Critical level for protection of lichens, mosses and other raised bog plant species

The predicted long-term NO<sub>x</sub> and SO<sub>2</sub> concentrations due to emissions from the asphalt plant are equivalent to <1% of the NAQS critical levels at the Sheheree Bog SAC and Killarney National Park SPA. At the nearest boundary of the Killarney National Park, Macgillycuddy Reeks and Caragh River SAC, which is only 0.63km from the plant and also adjacent to the N22, the predicted concentration is <3% of the NO<sub>x</sub> and <5% of the SO<sub>2</sub> NAQS.

The long-term effect of N deposition due to NO<sub>x</sub> emissions from the asphalt plant at the conservation sites are less than 1% of the Critical Load of 5 kgN/ha/yr at the Sheheree Bog SAC and Killarney National Park SPA. For the SAC boundary near the N22 the N deposition rate is predicted to be equivalent to 6% of the Critical load. However, along the River Flesk the potential additional N deposition decreases to below 2%.

These results confirm the conclusions of the 2021 Envirocon report that impacts from the asphalt plant emissions will have an imperceptible effect on the existing air quality and N deposition at the 3 conservation sites.

## References

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- (7) *EPA, Air Quality in Ireland – 2018, 2019 and 2020, Summary Data Tables, [www.epa.ie](http://www.epa.ie)*

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