

IN THE MATTER OF AN APPLICATION
TO

AN BORD PLEANÁLA

FOR APPROVAL OF (I) THE N6 GALWAY
CITY RING ROAD PURSUANT TO SECTION
51 OF THE ROADS ACT 1993 (AS
AMENDED); (II) THE N6 GALWAY CITY
RING ROAD MOTORWAY SCHEME 2018; and
(III) THE N6 GALWAY CITY RING ROAD
PROTECTED ROAD SCHEME 2018

ABP Ref. ABP-302848-18 and ABP-
302885-18

Response to Queries raised in Module 2 of
the N6 Galway City Ring Road in respect of
Lackagh Quarry Material Deposition Areas

Oral Hearing

by

Mike Evans, Eileen McCarthy, Mary Hurley
- Engineering
Marie Fleming, Cathal Mac an tSearaigh – Soils and Geology

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Appendices

Corrigenda to Appendix A.1.11

1 Introduction

- 1.1.1 The purpose of this document is to summarise the development of the Material Deposition Areas (MDA) throughout the project, and to record the final status of the MDAs in Lackagh Quarry in respect of Module 2 queries on the N6 Galway City Ring Road (GCRR). These MDAs were discussed in detail in Module 1 of the Oral Hearing in respect of their ecological value.
- 1.1.2 Such a summary is provided on the overall earthworks balance in this document with reference to the information contained within the Environmental Impact Assessment Report (EIAR) and the subsequent Request for Further Information (RFI) Response.
- 1.1.3 An appendix, Appendix A.1.11, was prepared as part of the RFI Response to address the specific query raised by An Bord Pleanála (ABP) relating to the permanent layout of Lackagh Quarry post construction of the proposed N6 GCRR.

2 Capacity of MDAs

- 2.1.1 Section 9.3.2.3 of the EIAR states that *'importation of material from outside the site will be minimised by ensuring that materials arising within the site area are used to the greatest extent possible. Any surplus material remaining which cannot be incorporated into the construction fill activities shall be placed in material deposition areas within the proposed road development. This will significantly reduce the deposition of material off-site.'*
- 2.1.2 Table 11.27 in Section 11.4.1.5 of the EIAR gives an estimate of potential material deposition areas and their approximate capacity. It also noted that these sites provide a storage capacity in excess of the anticipated 370,000m³ of potentially excess unacceptable material which may be encountered. As detailed in Section 2 of Appendix A.1.11 of the RFI Response, page 3, the maximum theoretical capacity available in the MDAs at the time of the assessment for the EIAR was 836,800m³ (98,800m³ of peat +738,000m³ of U1 Material).
- 2.1.3 Appendix A.1.11 of the RFI Response presented an overview of the deposition assessment for Lackagh Quarry and presented a modified solution for the MDA layouts and the respective quantity and material anticipated in the MDAs in Lackagh Quarry. A remodelling exercise was undertaken to estimate the capacity of the MDAs and Section 6.2.1 on Page 24 of Appendix A.1.11 quotes the theoretical capacity in all the MDAs as 824,000m³ (being 99,000m³ of Peat and 725,000m³ of U1 Non-Hazardous Material).

- 2.1.4 Annex 2 of this Appendix A.1.11 is the *Material Deposition Areas - Baseline Report* and set out the MDAs which are retained following the modified work that was carried out which involved the removal/creation/refinement of MDAs. Table 5.1 on Pages 17 and 18 of this Annex 2 presents the breakdown of the allowable capacity of the MDAs available after the remodelling exercise as 806,700m³. To explain, this figure of 806,700m³ is the addition of all of the Allowable Capacity for each of the 32 no. MDAs referred to in Table 5.1 on Pages 17 and 18 of Annex 2 of Appendix A.1.11.
- 2.1.5 Table 5.1 on Pages 17 and 18 of this Annex 2 to Appendix A.1.11 also presents the volume of material which could be placed in each area taking account of the design requirements of each MDA. The total volume to be placed in these MDAs is 597,200m³ which is referred to in Table 5.1 as the “Estimated placement volume” and is simply the addition of the various volumes in all of the 32 MDA listed in Table 5.1 (subject to two corrections, one in relation to DA 28 which is 231,000m³ and not 240,000m³ as referred to in Table 5.1 (which is detailed in Table 3.3 on page 13 and Table 3.5 on page 16 as being the estimated placement volume/capacity of material in DA 28 of namely 231,000m³ (217,000m³+14,000m³) and a correction in relation to DA 38 as explained in the corrigendum appended.
- 2.1.1 There is, therefore, spare capacity in the MDAs is of the order of 26%. This spare capacity is necessary to allow for variable ground conditions, bulking arising from the direct re-use of 2.6 million cubic meters of material across the full extents of the proposed road development as engineering fill, suitability of the material taken as 100% reuse, weather conditions during construction, etc. Given these considerations and our professional engineering experience, the spare capacity within the MDAs is in keeping with our experience from previous construction projects.

3 Material Arising

- 3.1.1 Section 7.4.9.2 of the EIAR presents a summary of the earthworks quantities. Table 7.3 of Chapter 7 of the EIAR quotes the volume of peat arising as 76,000m³ and the potential volume of material which is unsuitable for engineering reuse in road construction as 290,000m³ comprising of 191,000m³ (U1 material) +33,000m³ (topsoil surplus) + 66,000m³ (Marginal surplus), noting that it is all reused on site with some of this reuse being in the MDAs.
- 3.1.2 Section 2.1 on Page 2 of Annex 2 to Appendix A.1.11 provides detail on the volume of material to be accommodated in the MDAs. Section 2.1 states that approximately 366,000m³ of material will be generated for placement in the MDAs of which 76,000m³ is peat. This represents

the excavated material less the quantities of material estimated to be used in the road construction. Section 2.1.1 (and on Page 2 of Annex 2 to Appendix A.1.11) describes the bulking factors applied to this volume, which gives an **overall volume of 475,800m³** (being the addition of the various bulked figures in Section 2.1.1) **of which 98,800m³ is peat, to be placed in MDAs.**

- 3.1.3 The peat capacity outside of Lackagh Quarry (47,000m³) is utilised to the maximum extent possible in the MDAs where peat is permissible as detailed in Section 3 of Annex 2 of the Appendix A.1.11 of the RFI Response, page 4. Thereafter, the remaining peat volume to be placed in the MDAs within Lackagh Quarry is 51,800m³. This represents more than 50% of the total peat to be placed.

4 Review of MDAs at Lackagh Quarry

- 4.1.1 Following meaningful engagement with the owner of Lackagh Quarry in 2019, a 3D modelling exercise was undertaken on the MDAs in Lackagh Quarry to determine the full extent of material required to achieve the objectives of the MDAs proposed at this location. Section 3 on Page 3 of Appendix A.1.11 details the assessment of this 3D remodelling and reshaping of the MDAs in Lackagh Quarry to assess and ascertain if it were possible with such remodelling to reduce the permanent land acquisition in the quarry while still meeting the critical functional requirements of the MDAs at this location.
- 4.1.2 This review focused on combining the slope stabilisation requirements and material deposition requirements (also taking into account ecological habitat requirements) at this location which resulted in reshaping and recreating some MDAs.
- 4.1.3 Section 3.2 on Page 5 and onwards of Appendix A.1.11 identifies each of the Lackagh Quarry MDAs and provides the following information on each:
- Reassessment of the capacity following the remodelling in 3D of each MDA based on the EIAR plan layout.
 - Assessment of the capacity of the reshaped MDAs namely DA 24, DA 27 and DA 28.
 - Assessment of the capacity of the newly created DA 25.
- 4.1.4 Table 3.5 on Page 16 of Appendix A.1.11 presents the summary of this comparison. The figure of 63,000m³ for the estimate capacity of U1 material for DA 24 should read 67,000m³ (at Table 5.1 of Annex 2 to Appendix A.1.11 (pages 17 and 18), DA24 has an estimated replacement volume/capacity of 104,000m³ of which 37,000m³ is peat

leaving 67,000m³ of U1 material rather than 63,000m³). The total therefore of the estimated capacity in Table 3.5 on Page 16 of Appendix A.1.11 is 304,200m³ and not 301,000m³. This is the subject of a short corrigendum appended to this document.

- 4.1.5 The final capacities and plan areas of each of the MDAs in Lackagh Quarry following the reshaping of DA 24, DA 27 and DA 28, the creation of DA 25 and the deletion of DA 23 is reproduced in Table 1 below for ease of reference and clarity. It is confirmed that the figures in Table 1 below are contained in Appendix A.1.11 with the only amendments made in relation to correcting the volume arithmetical value for DA 24 and a follow on change of the total estimated capacity of U1 material.
- 4.1.6 It is material arising from the construction of the proposed N6 GCRR that is utilised in the creation of the MDAs referenced in Table 1 below. Therefore, the makeup of that material arising is of critical importance as it influences the shape, height and plan area of the MDAs.
- 4.1.7 Section 5 on Page 21 of Appendix A.11.1 presents the revised areas for habitat creation on the newly remodelled MDAs in Lackagh Quarry. These areas are included in Table 1 below for convenience. The total area of habitat recreation following the reconfiguration and remodelling of the MDAs is the same as that presented in the EIAR, i.e., 4.85Ha.

Table 1: Lackagh Quarry Capacity Summary

Material Deposition Area	Quantities as presented in RFI Response 2019			
	Estimated Capacity of U1 m ³	Estimated Capacity of Peat m ³	Estimated Capacity of Drainage Layer m ³	Plan Area for Habitat Compensation Ha
DA 23	33,000	12,000	0	0
DA 24	<u>67,000*</u>	37,000	0	2.03
DA 25	3,500	3,000	0	0.37
DA 27	16,700	0	2,800	0
DA 28	217,000	14,000	77,000	2.45
Total	304,200	54,000	79,800	4.85

* This is incorrectly quoted as 63,000 in Table 3.5 of Appendix A.1.11

4.1.8 **The removal of DA 23 as an MDA from Lackagh Quarry enabled the return of approximately 3.01 Ha of land post completion of construction to the property owner.**

4.1.9 However, the removal of DA 23 and the reshaping of DA 24 resulted in an increased volume of peat and U1 which had to be accommodated in the other MDAs throughout the site. Section 6 on Page 24 and onwards of Appendix A.1.11 presents a summary of the various quantities for the MDAs in Lackagh Quarry. Table 1 above includes all the relevant numbers and should be read in conjunction with Table 6.2 on Page 28 of Appendix A.1.11 to understand the full extents of material required to achieve the objectives of the MDAs proposed at this location. Please also note that Table 6.2 on Page 28 of Appendix A.1.11 refers to DA 24 as having 63,000m³ of U1 material instead of 67,000m³ and also then as a consequence the total Placement Volume of U1 Material in Table 6.2 on Page 28 should read 496,200m³ not 492,200m³. Again this is dealt with in a short corrigendum appended.

5 Conclusion

5.1.1 DA 24 and DA 25 are critical MDAs for the purposes of the safe and sustainable deposition of materials arising and, in particular, the sustainable deposition of peat extracted as a result of the construction of the proposed road development. As demonstrated in the RFI Response, 3 no. of the MDAs in Lackagh Quarry have the capacity to

cater for 54,000m³ of peat. The core issue is that 51,800m³ of peat has to be deposited within 3 no. MDAs in Lackagh Quarry. Of these 3 no. MDAs containing peat, the largest is DA 24 with 37,000m³ proposed to be deposited. In order to deposit that quantity of peat safely within DA 24, 67,000m³ of U1 material is required to be placed in DA 24, so as to (i) ensure upper shelf stability/stabilise the quarry face; and (ii) mixing/bunding peat within DA 24.

- 5.1.2 It is always recommended to deposit excess material arising as close as possible to the point of extraction as doing so results in most sustainable deposition of such excess materials.
- 5.1.3 Since the adjournment of the hearing in March 2020, due to the Covid 19 restrictions, “The Waste Action Plan for a Circular Economy” has been published. The report highlights that improvements in waste management practices can offer many opportunities in terms of reduced environmental and financial costs to the industry and society. The deposition of peat in Lackagh Quarry is consistent with the objectives of the “The Waste Action Plan for a Circular Economy”.

Appendix A

A1 RFI Response Appendix A.1.11 Corrigenda 19 October 2020

As presented in Table 3.5 on page 16 and Table 6.2 on page 28 of Appendix A.1.11, allowable capacity of material at DA24 is 230,000m³ (190,000m³+40,000m³). This number was misquoted in a paragraph on page 7 of Section 3.2.2.1 which is now amended below **with changes tracked in red**.

*“The earthworks assessment completed in Civil 3D concluded that ~~190,000~~230,000m³ of material can be placed in this area, of which 40,000m³ is peat. A plan and cross sections of area DA24 is presented in **Figure 3.3**.”*

As presented in Table 5.1 on page 18 of Annex 2 of Appendix A.1.11, the estimated placement of material at DA24 is 104,000m³. This number was misquoted in a paragraph on page 8 of Section 3.2.2.2 of Appendix A.1.11 which is now amended below **with changes tracked in red**.

*“The earthworks assessment completed of the modified layout in Civil 3D concluded that ~~67,000~~104,000m³ of material can be placed in this area, of which 37,000m³ is peat. This layout is attainable with the addition of an alternative location for ecological habitat compensation and peat material. This area has been identified as DA25, refer to **Section 3.2.2.3**.”*

A typographical error in a paragraph on page 10 of Section 3.2.3.2 of Appendix A.1.11 has been amended and is presented below **with changes tracked in red**.

*“An alternative solution for DA27 takes into consideration the drainage pond located to the north ~~east-west~~ of DA27. This includes a reduced footprint with deeper volumes of deposition (including stabilisation layers) on the surfaces. Plan and cross section of the proposed solution is presented in the **Figure 3.7** below.”*

A paragraph in page 16 of Section 3.3 of Appendix A.1.11 has been amended and is presented below **with changes tracked in red**. This is a calculation error of a total arising from the change to Table 3.5 below.

“As observed in the table below, the capacity of the allowable material placement in the Modified MDAs within Lackagh Quarry exceeds the capacity requirement as set out in Section 2.2 as follows:

- Peat: 54,000m³ (required 51,800m³ as per **Section 2.2**)
- U1 Non-Hazardous Material: ~~301,000~~304,200m³ (required 185,500 m³ as per **Section 2.2**)”

Table 3.5 on page 16 of Section 3.3 of Appendix A.1.11 has been amended and an extract of the relevant two rows of this table is presented below **with changes tracked in red**. At Table 5.1 of Annex 2 to Appendix A.1.11 (pages 17 and 18), DA24 has an estimated replacement volume/capacity of 104,000m³ of which 37,000m³ is peat leaving 67,000m³ of U1 material rather than 63,000m³ included in error in Table 3.5 below.

Amended Table 3.5: Lackagh Quarry Capacity Summary

Material Deposition Area	EIAR Area Details (2018)		Proposed Modification (2019)	
	Allowable Capacity of U1 m ³	Estimated Capacity of Peat m ³	Estimated Capacity of U1 m ³	Estimated Capacity of Peat m ³
DA24	190,000	40,000	63,000 67,000	37,000
...				
Total (drainage layer volume excluded)	533,000	52,000	301,000 304,200	54,000

Table 6.1 was amended as part of a 'Corrigendum' document that was handed in to the Oral Hearing and uploaded to the project website (<http://www.n6galwaycityringroad.ie/>) on 21 February 2020.

As noted above and included in Table 5.1 on page 18 of Annex 2 of Appendix A.1.11 the estimated placement volume/capacity of material in DA 24 is 104,000m³. Also, as detailed in Table 3.3 on page 13 and Table 3.5 on page 16 the estimated placement volume/capacity of material in DA 28 is 231,000m³ (217,000m³+14,000m³).

The below extract of the two relevant rows from Table 6.1 shows these correct values, and is presented **with the changes tracked in green**.

Amended Table 6.1: Summary of proposed Lackagh Quarry material deposition area details and requirements

Number	Approx. Chainage	Area (ha)	Approx. Capacity (m ³)	Material designation	Construction / Design Specific Requirement
DA24	11+350	2.52	200,000 100,000 104,000	U1 with Peat placed in U1 bunds at higher levels	Contractor to update drainage design to include for their proposed Material Deposition Area in accordance with the requirements set out in the EIAR
...					
DA28	11+650	2.8	250,000 241,000 231,000	U1 with Peat placement on the flat areas and granular drainage layers (vertical and horizontal) and stability layers throughout.	Drainage layer to +17.7mOD required, a filter separator (e.g. geotextile is required between the horizontal interface between the drainage layer and general fill to prevent migration of fines sediment. Vertical and horizontal drainage layers are required between the existing rock face and material placement. Contractor to update drainage

Number	Approx. Chainage	Area (ha)	Approx. Capacity (m ³)	Material designation	Construction / Design Specific Requirement
					design to include for their proposed Material Deposition Area in accordance with the requirements set out in the EIAR

Table 6.2 on Page 28 of Section 6.3 of Appendix A.1.11 summarises the proposed deposition volumes in Lackagh Quarry.

As explained above the 63,000m³ of U1 material relating to DA24 should be noted as 67,000m³ in Table 6.2, resulting in consequential calculation changes to the ‘placement volume’ and ‘surplus/deficit of what is required’. The relevant extract from Table 6.2 is presented below **with the changes tracked in red.**

Amended Table 6.2: Summary Volumes

Location	EIAR		Proposed Estimated Capacity following review	
	Peat m ³	U1 Material m ³	Peat m ³	U1 Material m ³
<i>Placement Volumes -</i>	<i>Allowable Capacity</i>		<i>Estimated Capacity</i>	
...				
DA 24	40,000	190,000	37,000	63,000 67,000
...				
<i>Totals</i>				
Placement Volume	99,000	725,000	101,000	492,200 496,200
Surplus / Deficit of what is required	Nil	+348,000	+2,200	+115,200 +119,200

Table 6.3 on Page 28 to 29 of Section 6.4 of Appendix A.1.11 summarises the requirements for the MDAs in Lackagh Quarry.

As explained above, the estimated capacity for DA24 on page 29 should read 67,000m³ for U1 material and not 63,000m³. In relation to DA28, Table 3.5 of Appendix A.1.11 (page 16) correctly recorded the estimated capacity of U1 material at 217,000m³ and for peat at 14,000m³, and are corrected below.

Table 6.3 has been amended and an extract of it is presented below **with the changes tracked in red.**

Number	Particular Requirement
DA24	... Estimated Capacity: 1. U1 material: 63,000 67,000m ³ ...

Number	Particular Requirement
...	
DA28	...Estimated Capacity: <ol style="list-style-type: none"> 1. U1 material: 227,000217,000m³ 2. Peat: 414,000m³

The estimated place volume/capacity for DA28 (discussed above) and a typographical error with respect to DA38 is amended in Table 5.1 of Annex 2 (*Material Deposition Areas - Baseline Report*) of Appendix A.1.11 (page 17) and the amendment is presented below **with the changes tracked in red.**

Amended Table 5.1: Material Deposition Area allowable placement material, estimated placement volume and material type

Number	Location	Allowable Capacity (m ³)	Estimated placement volume (m ³)	Material Type
...				
DA28	Lackagh Quarry	283,000	242,000 231,000	U1 with contained peat placement in flat areas
...				
DA38	Coolagh	63,000	41,500 41,800	U1