

**Environmental Impact Assessment Report**  
**for**  
**Diversion of 110 kV Overhead Line**  
**at**  
**Intel, Leixlip Co. Kildare**

**prepared for**



**by**  
**Environmental Impact Services**

1<sup>st</sup> Floor

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# Table of Contents

|                                                                            |           |
|----------------------------------------------------------------------------|-----------|
| <b>GLOSSARY OF TERMS .....</b>                                             | <b>IX</b> |
| <b>1 INTRODUCTION .....</b>                                                | <b>1</b>  |
| 1.1 INTRODUCTION AND TERMS OF REFERENCE .....                              | 1         |
| 1.2 FORMAT .....                                                           | 2         |
| 1.3 STUDY TEAM .....                                                       | 3         |
| 1.4 IMPACT PREDICTIONS .....                                               | 5         |
| 1.5 DIFFICULTIES ENCOUNTERED .....                                         | 6         |
| 1.6 LEVEL OF DETAIL IN PROJECT DESCRIPTION .....                           | 7         |
| 1.7 A NOTE ON QUOTATIONS .....                                             | 7         |
| <b>2 SCREENING &amp; SCOPING .....</b>                                     | <b>8</b>  |
| 2.1 LEGISLATION AND GUIDANCE .....                                         | 8         |
| 2.2 SCREENING .....                                                        | 9         |
| 2.3 SCOPING .....                                                          | 9         |
| 2.4 APPROACH TO EIAR REQUIREMENTS INTRODUCED BY DIRECTIVE 2014/52/EU ..... | 11        |
| <b>3 ALTERNATIVES .....</b>                                                | <b>13</b> |
| 3.1 INTRODUCTION .....                                                     | 13        |
| 3.2 ALTERNATIVE LOCATION .....                                             | 14        |
| 3.3 ALTERNATIVE ROUTES .....                                               | 15        |
| 3.4 EVALUATION OF ALTERNATIVE ROUTES .....                                 | 16        |
| 3.5 EVALUATION CRITERIA APPLIED TO ALL UGG AND OHL OPTIONS .....           | 19        |
| 3.6 EMERGING BEST PERFORMING OPTION .....                                  | 20        |
| <b>4 PROJECT DESCRIPTION .....</b>                                         | <b>22</b> |
| 4.1 INTRODUCTION .....                                                     | 22        |
| 4.2 DESCRIPTION OF SITE AND SURROUNDINGS .....                             | 22        |
| 4.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT .....                          | 22        |
| 4.4 CONSTRUCTION .....                                                     | 27        |
| 4.5 PROTECTION OF THE ENVIRONMENT DURING OPERATION .....                   | 27        |
| <b>5 POPULATION &amp; HUMAN HEALTH .....</b>                               | <b>28</b> |
| 5.1 INTRODUCTION .....                                                     | 28        |
| 5.2 THE PROPOSED DEVELOPMENT .....                                         | 28        |
| 5.3 THE EXISTING ENVIRONMENT .....                                         | 28        |
| 5.4 PREDICTED IMPACTS .....                                                | 30        |
| 5.5 MITIGATION MEASURES .....                                              | 32        |
| 5.6 RESIDUAL IMPACTS .....                                                 | 32        |
| <b>6 BIODIVERSITY .....</b>                                                | <b>33</b> |
| 6.1 INTRODUCTION/METHODOLOGY .....                                         | 33        |
| 6.2 THE PROPOSED DEVELOPMENT .....                                         | 50        |
| 6.3 THE RECEIVING ENVIRONMENT .....                                        | 52        |
| 6.4 PREDICTED EFFECTS .....                                                | 73        |
| 6.5 MITIGATION AND MONITORING MEASURES .....                               | 81        |
| 6.6 RESIDUAL IMPACTS .....                                                 | 88        |
| 6.7 CUMULATIVE IMPACT .....                                                | 89        |
| 6.8 INTERACTIONS .....                                                     | 90        |
| <b>7 LAND, SOILS, GEOLOGY &amp; HYDROGEOLOGY .....</b>                     | <b>92</b> |
| 7.1 INTRODUCTION /METHODOLOGY .....                                        | 92        |

|           |                                            |            |
|-----------|--------------------------------------------|------------|
| 7.2       | THE PROPOSED DEVELOPMENT.....              | 93         |
| 7.3       | THE RECEIVING ENVIRONMENT.....             | 96         |
| 7.4       | PREDICTED EFFECTS.....                     | 121        |
| 7.5       | MITIGATION AND MONITORING MEASURES.....    | 123        |
| 7.6       | RESIDUAL IMPACTS.....                      | 126        |
| 7.7       | CUMULATIVE IMPACT.....                     | 127        |
| 7.8       | INTERACTIONS.....                          | 127        |
| <b>8</b>  | <b>WATER &amp; HYDROLOGY .....</b>         | <b>128</b> |
| 8.1       | INTRODUCTION/METHODOLOGY.....              | 128        |
| 8.2       | THE PROPOSED DEVELOPMENT.....              | 129        |
| 8.3       | THE RECEIVING ENVIRONMENT.....             | 130        |
| 8.4       | PREDICTED EFFECTS.....                     | 135        |
| 8.5       | MITIGATION AND MONITORING MEASURES.....    | 137        |
| 8.6       | RESIDUAL IMPACTS.....                      | 141        |
| 8.7       | CUMULATIVE IMPACT.....                     | 141        |
| 8.8       | INTERACTIONS.....                          | 141        |
| <b>9</b>  | <b>AIR QUALITY &amp; CLIMATE.....</b>      | <b>142</b> |
| 9.1       | INTRODUCTION/METHODOLOGY.....              | 142        |
| 9.2       | THE PROPOSED DEVELOPMENT.....              | 145        |
| 9.3       | THE RECEIVING ENVIRONMENT.....             | 146        |
| 9.4       | PREDICTED EFFECTS.....                     | 151        |
| 9.5       | MITIGATION AND MONITORING MEASURES.....    | 154        |
| 9.6       | RESIDUAL IMPACTS.....                      | 155        |
| 9.7       | CUMULATIVE IMPACT.....                     | 156        |
| 9.8       | INTERACTIONS.....                          | 156        |
| <b>10</b> | <b>NOISE &amp; VIBRATION .....</b>         | <b>157</b> |
| 10.1      | INTRODUCTION/METHODOLOGY.....              | 157        |
| 10.2      | THE PROPOSED DEVELOPMENT.....              | 162        |
| 10.3      | THE RECEIVING ENVIRONMENT.....             | 163        |
| 10.4      | PREDICTED EFFECTS.....                     | 166        |
| 10.5      | MITIGATION AND MONITORING MEASURES.....    | 170        |
| 10.6      | RESIDUAL EFFECTS.....                      | 171        |
| 10.7      | INTERACTIONS.....                          | 171        |
| <b>11</b> | <b>LANDSCAPE &amp; VISUAL IMPACT .....</b> | <b>172</b> |
| 11.1      | INTRODUCTION.....                          | 172        |
| 11.2      | THE PROPOSED DEVELOPMENT.....              | 175        |
| 11.3      | THE RECEIVING ENVIRONMENT.....             | 180        |
| 11.4      | PREDICTED IMPACTS.....                     | 211        |
| 11.5      | IMPACTS ON WIDER LANDSCAPE.....            | 242        |
| 11.6      | MITIGATION AND MONITORING MEASURES.....    | 243        |
| 11.7      | RESIDUAL IMPACTS.....                      | 244        |
| 11.8      | CUMULATIVE ASSESSMENT.....                 | 244        |
| <b>12</b> | <b>MATERIAL ASSETS .....</b>               | <b>245</b> |
| 12.1      | INTRODUCTION.....                          | 245        |
| 12.2      | ENERGY DEMAND.....                         | 245        |
| 12.3      | WATER.....                                 | 245        |
| 12.4      | RELOCATION OF EXISTING SERVICES.....       | 245        |
| <b>13</b> | <b>WASTE MANAGEMENT .....</b>              | <b>247</b> |
| 13.1      | INTRODUCTION.....                          | 247        |
| 13.2      | PROPOSED DEVELOPMENT.....                  | 250        |

|           |                                                    |            |
|-----------|----------------------------------------------------|------------|
| 13.3      | RECEIVING ENVIRONMENT.....                         | 252        |
| 13.4      | PREDICTED EFFECTS.....                             | 252        |
| 13.5      | MITIGATION MEASURES.....                           | 253        |
| 13.6      | RESIDUAL IMPACTS.....                              | 255        |
| 13.7      | CUMULATIVE IMPACTS.....                            | 255        |
| 13.8      | INTERACTIONS.....                                  | 256        |
| <b>14</b> | <b>BUILT HERITAGE .....</b>                        | <b>257</b> |
| 14.1      | INTRODUCTION/METHODOLOGY.....                      | 257        |
| 14.2      | THE PROPOSED DEVELOPMENT.....                      | 264        |
| 14.3      | THE RECEIVING ENVIRONMENT .....                    | 264        |
| 14.4      | HERITAGE IMPACT ASSESSMENTS.....                   | 276        |
| 14.5      | PREDICTED EFFECTS.....                             | 308        |
| <b>15</b> | <b>ARCHAEOLOGY.....</b>                            | <b>313</b> |
| 15.1      | INTRODUCTION.....                                  | 313        |
| 15.2      | THE PROPOSED DEVELOPMENT.....                      | 314        |
| 15.3      | THE RECEIVING ENVIRONMENT.....                     | 316        |
| 15.4      | PREDICTED EFFECTS.....                             | 327        |
| 15.5      | MITIGATION AND MONITORING MEASURES.....            | 328        |
| 15.6      | RESIDUAL IMPACTS.....                              | 328        |
| 15.7      | CUMULATIVE IMPACT.....                             | 328        |
| 15.8      | INTERACTIONS.....                                  | 328        |
| <b>16</b> | <b>ACCIDENT &amp; DISASTER RISKS .....</b>         | <b>329</b> |
| 16.1      | INTRODUCTION.....                                  | 329        |
| 16.2      | THE PROPOSED DEVELOPMENT.....                      | 329        |
| 16.3      | THE RECEIVING ENVIRONMENT.....                     | 330        |
| 16.4      | PREDICTED IMPACTS.....                             | 332        |
| 16.5      | MITIGATION AND MONITORING MEASURES.....            | 332        |
| 16.6      | MONITORING.....                                    | 332        |
| 16.7      | RESIDUAL IMPACT .....                              | 332        |
| <b>17</b> | <b>INTERACTIONS &amp; CUMULATIVE EFFECTS .....</b> | <b>333</b> |
| 17.1      | INTRODUCTION.....                                  | 333        |
| 17.2      | MATRIX OF INTERACTIONS.....                        | 333        |
| 17.3      | INTERACTIONS.....                                  | 335        |
| 17.4      | CUMULATIVE EFFECTS.....                            | 338        |
|           | <b>LIST OF SOURCES.....</b>                        | <b>343</b> |

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28 NOV 2022  
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# List of Figures

|                                                                                              |     |
|----------------------------------------------------------------------------------------------|-----|
| Figure 1.1 Site location.....                                                                | 1   |
| Figure 3.1 Two alternative location strategies .....                                         | 14  |
| Figure 3.2 OHL Options O1, O2a, O2b, O2c, O2d O2e.....                                       | 15  |
| Figure 3.3 UGC Options U1, U2, U3, U4.....                                                   | 16  |
| Figure 4.1 Proposed Route Layout.....                                                        | 23  |
| Figure 4.2 Proposed Elevations (A-A) .....                                                   | 24  |
| Figure 4.3 Proposed Elevations (B-B) .....                                                   | 25  |
| Figure 4.4 Proposed Elevations (C-C) .....                                                   | 26  |
| Figure 4.5 Indicative contractor areas .....                                                 | 27  |
| Figure 6.1 Location of the Proposed Development site within the surrounding environment..... | 33  |
| Figure 6.2 Overall survey area .....                                                         | 36  |
| Figure 6.3 Petrifying Spring [*7220] Survey Area .....                                       | 39  |
| Figure 6.4 Breeding Bird Survey Area .....                                                   | 40  |
| Figure 6.5 Winter bird survey area .....                                                     | 41  |
| Figure 6.6 Mollusc survey area.....                                                          | 42  |
| Figure 6.7 Vertigo sampling areas at Louisa Bridge .....                                     | 44  |
| Figure 6.8 Bat transects and static bat detector locations within the study area .....       | 48  |
| Figure 6.9 European sites in the vicinity of the proposed development .....                  | 52  |
| Figure 6.10 National sites in the vicinity of the proposed development .....                 | 53  |
| Figure 6.11 Habitats relevant to the proposed development .....                              | 56  |
| Figure 6.12 Results of Petrifying Spring [*7220] Surveys.....                                | 57  |
| Figure 6.13 Breeding birds recorded within the wider survey area.....                        | 61  |
| Figure 6.14 Wintering birds recorded within the wider survey area.....                       | 64  |
| Figure 6.15 PRFs within and adjacent to the proposed development site .....                  | 66  |
| Figure 6.16 Mammals recorded within and adjacent to the proposed development site .....      | 69  |
| Figure 6.17 Crayfish records within the wider Intel lands .....                              | 71  |
| Figure 7.1 Foundation Section .....                                                          | 94  |
| Figure 7.2 Site Location and Local Environment .....                                         | 97  |
| Figure 7.3 Historic 6" Mapping.....                                                          | 98  |
| Figure 7.4 Historic 25" Mapping <sup>19</sup> .....                                          | 99  |
| Figure 7.5 Historic 1995 Aerial Map <sup>19</sup> .....                                      | 99  |
| Figure 7.6 Historic 2000 Aerial Map <sup>19</sup> .....                                      | 100 |
| Figure 7.7 Historic 2005 Aerial Map <sup>19</sup> .....                                      | 100 |
| Figure 7.8 Site Investigation Points .....                                                   | 101 |
| Figure 7.9 Soils Map.....                                                                    | 102 |
| Figure 7.10 Subsoils Map.....                                                                | 103 |
| Figure 7.11 Bedrock Geology Map .....                                                        | 104 |
| Figure 7.12 Aquifer Classification Map .....                                                 | 106 |
| Figure 7.13 Groundwater Vulnerability Map .....                                              | 109 |
| Figure 7.14 GSI Well Search .....                                                            | 111 |
| Figure 7.15 Local Cross Section A-A'.....                                                    | 119 |
| Figure 7.16 Local Cross Section B-B'.....                                                    | 120 |
| Figure 8.1 Site Location and Local Environment .....                                         | 132 |
| Figure 8.2 EPA Water Quality Stations near of the Subject Site .....                         | 134 |
| Figure 9.1 Casement Aerodrome Met Station Windrose 2017 – 2021 .....                         | 147 |
| Figure 10.1 dB(A) Scale & Indicative Noise Levels .....                                      | 158 |
| Figure 10.2 Transient Vibration Guide Values for Cosmetic Damage .....                       | 161 |
| Figure 10.3 Noise Survey Locations .....                                                     | 164 |
| Figure 10.4 Noise Sensitive Locations .....                                                  | 168 |
| Figure 11.1 View Location Map .....                                                          | 176 |
| Figure 11.2 Intel campus in Context.....                                                     | 180 |
| Figure 11.3 Landscape Character Areas.....                                                   | 181 |
| Figure 11.4 Local Landscape Enclosure between Viaduct and Berms .....                        | 182 |
| Figure 11.5 Proposed route in context of relevant designations.....                          | 183 |
| Figure 11.6 Existing View 1.....                                                             | 185 |

|                                                                              |     |
|------------------------------------------------------------------------------|-----|
| Figure 11.7 Existing View 2a.....                                            | 186 |
| Figure 11.8 Existing View 2b.....                                            | 187 |
| Figure 11.9 Existing View 3a.....                                            | 188 |
| Figure 11.10 Existing View 3c .....                                          | 189 |
| Figure 11.11 Existing View 4a .....                                          | 190 |
| Figure 11.12 Existing View 4b.....                                           | 191 |
| Figure 11.13 Existing View 4c .....                                          | 192 |
| Figure 11.14 Existing View 5a .....                                          | 193 |
| Figure 11.15 Existing View 5b.....                                           | 194 |
| Figure 11.16 Existing View 5c .....                                          | 195 |
| Figure 11.17 Existing View A1.....                                           | 196 |
| Figure 11.18 Existing View A2a .....                                         | 197 |
| Figure 11.19 Existing View A2b .....                                         | 198 |
| Figure 11.20 Existing View A3a .....                                         | 199 |
| Figure 11.21 Existing View A3b.....                                          | 200 |
| Figure 11.22 Existing View A4a .....                                         | 201 |
| Figure 11.23 Existing View A4b.....                                          | 202 |
| Figure 11.24 Existing View A5a .....                                         | 203 |
| Figure 11.25 Existing View A5b.....                                          | 204 |
| Figure 11.26 Existing View A6a.....                                          | 205 |
| Figure 11.27 Existing View A6b.....                                          | 206 |
| Figure 11.28 Existing View A7a.....                                          | 207 |
| Figure 11.29 Existing View A7b.....                                          | 208 |
| Figure 11.30 Existing View A7c .....                                         | 209 |
| Figure 11.31 Existing View A8.....                                           | 210 |
| Figure 11.32 Proposed View 1.....                                            | 212 |
| Figure 11.33 Proposed View 02a .....                                         | 213 |
| Figure 11.34 Proposed View 02b.....                                          | 214 |
| Figure 11.35 Proposed View 03a .....                                         | 215 |
| Figure 11.36 Proposed View 03b.....                                          | 216 |
| Figure 11.37 Proposed View 4a .....                                          | 217 |
| Figure 11.38 Proposed View 04b.....                                          | 218 |
| Figure 11.39 Proposed View 04c .....                                         | 219 |
| Figure 11.40 Proposed View 05a.....                                          | 220 |
| Figure 11.41 Proposed View 05b.....                                          | 221 |
| Figure 11.42 Proposed View 05bc .....                                        | 222 |
| Figure 11.43 Proposed View A1.....                                           | 223 |
| Figure 11.44 Proposed View A2a.....                                          | 224 |
| Figure 11.45 Proposed View A2b.....                                          | 225 |
| Figure 11.46 Proposed View A3a.....                                          | 226 |
| Figure 11.47 Proposed View A3b.....                                          | 227 |
| Figure 11.48 Proposed View A4a.....                                          | 228 |
| Figure 11.49 Proposed View A4b.....                                          | 229 |
| Figure 11.50 Proposed View A5a.....                                          | 230 |
| Figure 11.51 Proposed View A5a.....                                          | 231 |
| Figure 11.52 Proposed View A6a.....                                          | 232 |
| Figure 11.53 Proposed View A6b.....                                          | 233 |
| Figure 11.54 Proposed View A7a.....                                          | 234 |
| Figure 11.55 Proposed View A8.....                                           | 237 |
| Figure 11.56 Calibration of Impact Significance Against EPA Guidelines ..... | 241 |
| Figure 11.57 Intel in relation to long distance views.....                   | 243 |
| Figure 13.1 Waste Hierarchy (Source: European Commission) .....              | 248 |
| Figure 13.2 Circular Economy .....                                           | 249 |
| Figure 14.1 Down Survey (Extract) 1655 .....                                 | 266 |
| Figure 14.2 Noble and Keenan Map of Kildare (Extract) 1752.....              | 267 |
| Figure 14.3 John Roque Kildare Estate Map (Extract) 1757 .....               | 268 |
| Figure 14.4 Alexander Taylor Map of Kildare (Extract) 1783.....              | 268 |

|                                                                                                         |     |
|---------------------------------------------------------------------------------------------------------|-----|
| Figure 14.5 Ordnance Survey First Edition (Extract) 1838 .....                                          | 269 |
| Figure 14.6 Ordnance Survey (Extract) 1907 .....                                                        | 270 |
| Figure 14.7 Record of protected structures in the Kildare County Development Plan 2017-2023 .....       | 271 |
| Figure 14.8 Proposed Protected Structures under Draft Kildare County Development Plan 2023 – 2029 ..... | 273 |
| Figure 14.9 Structures listed under the NIAH for County Kildare .....                                   | 274 |
| Figure 14.10 Non Protected Structures deemed to be of Heritage Importance Heritage Structures .....     | 275 |
| Figure 15.1 Site location map. ....                                                                     | 315 |
| Figure 15.2 Proposed development boundary in relation to nearest National Monument (No. 681). ....      | 317 |
| Figure 15.3 Recorded monuments within 1 km of the proposed EIAR boundary. ....                          | 322 |
| Figure 15.4 Nearest recorded monuments to the proposed EIAR boundary. ....                              | 323 |
| Figure 15.5 Proposed OHL diversion and existing line on 1 <sup>st</sup> edition OS background. ....     | 325 |
| Figure 15.6 Proposed OHL diversion and existing line on 2 <sup>nd</sup> edition OS background. ....     | 326 |
| Figure 16.1 Seismic movements .....                                                                     | 331 |

## List of Tables

|                                                                                                                                                                                                           |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| Table 1.1 Typical structure of specialist chapters .....                                                                                                                                                  | 2   |
| Table 1.2 Study team for EIAR.....                                                                                                                                                                        | 3   |
| Table 1.3 Impact predictions .....                                                                                                                                                                        | 6   |
| Table 2.1 Approach to EIAR requirements introduced by Directive 2014/52/EU.....                                                                                                                           | 11  |
| Table 3.1 Alternative Overhead Line Routes.....                                                                                                                                                           | 15  |
| Table 3.2 Underground Cable [UGC] OPTIONS U1, U2, U3, U4 .....                                                                                                                                            | 16  |
| Table 3.3 Scale of Assessment Criteria used .....                                                                                                                                                         | 18  |
| Table 3.4 Summary Evaluation of all routes .....                                                                                                                                                          | 19  |
| Table 3.5 Risk Summary Matrix for Route Options.....                                                                                                                                                      | 20  |
| Table 5.1 Population Change at State, Secondary and Immediate Hinterland Level .....                                                                                                                      | 30  |
| Table 6.1 Ecological survey information .....                                                                                                                                                             | 37  |
| Table 6.2 Specific Habitat Definitions for <i>Vertigo moulinsiana</i> at Louisa Bridge.....                                                                                                               | 43  |
| Table 6.3 Locations of sampling sites for <i>Vertigo moulinsiana</i> at Louisa Bridge .....                                                                                                               | 43  |
| Table 6.4 Population Condition Assessment Protocol for <i>Vertigo moulinsiana</i> at Louisa Bridge .....                                                                                                  | 44  |
| Table 6.5 Habitat Condition Assessment Protocol for <i>Vertigo moulinsiana</i> at Louisa Bridge .....                                                                                                     | 44  |
| Table 6.6 Locations of sampling sites for <i>Vertigo angustior</i> at Louisa Bridge .....                                                                                                                 | 45  |
| Table 6.7 Specific Habitat Definitions for <i>Vertigo angustior</i> at Louisa Bridge .....                                                                                                                | 45  |
| Table 6.8 Population Condition Assessment Protocol for <i>Vertigo angustior</i> at Louisa Bridge .....                                                                                                    | 45  |
| Table 6.9 Habitat Condition Assessment Protocol for <i>Vertigo angustior</i> at Louisa Bridge.....                                                                                                        | 45  |
| Table 6.10 Assessment Criteria for potential suitability of proposed development sites for bats, derived from similar criteria in Bat Surveys for Professional Ecologists: Good Practice Guidelines ..... | 47  |
| Table 6.11 Bat transect survey details .....                                                                                                                                                              | 48  |
| Table 6.12 Birds recorded during the dedicated breeding bird surveys.....                                                                                                                                 | 58  |
| Table 6.13 Wintering bird species recorded during the dedicated surveys.....                                                                                                                              | 62  |
| Table 6.14 Results of automated static bat detector surveys.....                                                                                                                                          | 67  |
| Table 6.15 Ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identification of the Key Ecological Receptors (KERs). ....    | 72  |
| Table 7.1 Foundation Dimensions .....                                                                                                                                                                     | 93  |
| Table 7.2 Earth Work Estimation .....                                                                                                                                                                     | 95  |
| Table 7.3 Groundwater Quality Results.....                                                                                                                                                                | 108 |
| Table 7.4 Vulnerability Mapping Guidelines .....                                                                                                                                                          | 110 |
| Table 7.5 Soil Quality Results.....                                                                                                                                                                       | 113 |
| Table 8.1 EPA Biological Q Ratings.....                                                                                                                                                                   | 134 |
| Table 8.2 Q Ratings for River Rye Water .....                                                                                                                                                             | 134 |
| Table 9.1 Ambient Air Quality Standards Regulations .....                                                                                                                                                 | 143 |
| Table 9.2 Background NO <sub>2</sub> Concentrations In Zone C Locations (µg/m <sup>3</sup> ).....                                                                                                         | 148 |

|                                                                                                            |     |
|------------------------------------------------------------------------------------------------------------|-----|
| Table 9.3 Background PM <sub>10</sub> Concentrations In Zone C Locations (µg/m <sup>3</sup> ).....         | 148 |
| Table 9.4 Sensitivity of the Area to Dust Soiling Effects on People and Property.....                      | 150 |
| Table 9.5 Sensitivity of the Area to Human Health Impacts.....                                             | 150 |
| Table 9.6 Sensitivity of the Area to Ecological Impacts .....                                              | 151 |
| Table 9.7 Risk of Dust Impacts – Earthworks.....                                                           | 152 |
| Table 9.8 Risk of Dust Impacts – Construction .....                                                        | 152 |
| Table 9.9 Risk of Dust Impacts – Trackout .....                                                            | 153 |
| Table 9.10 Summary of Dust Impact Risk used to Define Site-Specific Mitigation .....                       | 153 |
| Table 10.1 Permissible Noise Levels at Facade of Dwellings during Construction .....                       | 159 |
| Table 10.2 Construction Noise Significance Ratings .....                                                   | 159 |
| Table 10.3 Likely Effect Associated with Change in Traffic Noise Level, Construction Phase .....           | 160 |
| Table 10.4 Transient Vibration Guide Values for Cosmetic Building Damage.....                              | 161 |
| Table 10.5 Guidance on effects of human response to PPV magnitudes.....                                    | 162 |
| Table 10.6 Noise Sensitive Locations & Descriptions.....                                                   | 163 |
| Table 10.7 Noise Monitoring Results – Daytime.....                                                         | 165 |
| Table 10.8 Noise Monitoring Results – Night-time .....                                                     | 165 |
| Table 10.9 Noise Monitoring Results – Daytime.....                                                         | 165 |
| Table 10.10 Noise Monitoring Results – Night-time .....                                                    | 166 |
| Table 10.11 Typical noise levels associated with construction plant items .....                            | 167 |
| Table 10.12 Indicative Construction Noise Levels at Nearest Noise Sensitive Locations .....                | 169 |
| Table 11.1 View Locations and Reason for Selection .....                                                   | 177 |
| Table 11.2 Summary of Visibility and Significance of Effect for Viewing Points .....                       | 238 |
| Table 13.1 Predicted on and off-site reuse, recycle and disposal rates for demolition waste.....           | 251 |
| Table 14.1 Record of protected structures in the Kildare County Development Plan 2017-2023.....            | 272 |
| Table 14.2 Proposed Protected Structures under the Draft Kildare County Development Plan 2023 – 2029 ..... | 273 |
| Table 14.3 Structures listed under the NIAH for County Kildare.....                                        | 274 |
| Table 14.4 Non-Protected Structures deemed to be of Heritage Importance Heritage Structures....            | 275 |
| Table 14.5 Protected Structures under the Kildare County Development Plan 2017-2023.....                   | 309 |
| Table 14.6 Proposed Protected Structures under the Draft Kildare County Development Plan 2023 – 2029 ..... | 310 |
| Table 14.7 Heritage Structures Noted on The National Inventory of Architectural Heritage .....             | 312 |
| Table 14.8 Non-Protected Structures deemed to be of Heritage Importance .....                              | 312 |
| Table 15.1 Recorded monuments within 1 km of the proposed development EIAR boundary. ....                  | 318 |
| Table 17.1 Matrix of Interactions .....                                                                    | 334 |
| Table 17.2 Relevant other planned or permitted developments .....                                          | 338 |

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# List of Appendices

Appendices are provided in relation to the below listed chapters.  
The Appendices are contained in a separately bound volume.

## **Appendices to Chapter 1. Introduction**

Appendix 1.1 Compendium of Mitigation & Monitoring Measures

## **Appendices to Chapter 2. Screening & Scoping**

Appendix 2.1 Draft Scoping Report

Appendix 2.2 EIAR Compliance Assessment

## **Appendices to Chapter 3. Alternatives**

Appendix 3.1 Multi-criteria Comparison for Identifying the Best Performing Option

## **Appendices to Chapter 6. Biodiversity**

Appendix 6.1 Timber Cutting Requirements Technical Note

Appendix 6.2 Tree Survey Report

Appendix 6.3 Guidelines for Ecological Impact Assessment in the UK and Ireland

Appendix 6.4 Tree Impact/Protection Plan. July 2022

Appendix 6.5 Protected Sites for Nature Conservation in the Vicinity of the Proposed Development

Appendix 6.6 Johnston (2022). Hydrogeology of the tufa habitats in the Rye Water, Co. Kildare

Appendix 6.7 Denyer Ecology (2022) Intel Petrifying Spring Survey. March 2022.

## **Appendices to Chapter 7. Land, Soils, Geology & Hydrogeology**

Appendix 7.1 Impact Rating and Assessment Criteria

## **Appendices to Chapter 8. Water & Hydrology**

Appendix 8.1 Impact Rating and Assessment Criteria

## **Appendices to Chapter 9. Air Quality & Climate**

Appendix 9.1 Dust Management Plan

## **Appendices to Chapter 10. Noise & Vibration**

Appendix 10.1 Acoustic Terminology

## **Appendices to Chapter 11. Landscape & Visual Impact**

Appendix 11.1 Detailed Methodology

Appendix 11.2 Photomontages

## **Appendix to Chapter 13. Waste Management**

Appendix 13.1 Resource & Waste Management Plan

## **Appendix to Chapter 15. Archaeology**

Appendix 15.1 Statutory Context

Appendix 15.2 Photographic Record of OHL Diversion Route

# GLOSSARY OF TERMS

Technical terms used in this EIA.

| Acronym/Initialism | Full term                                           | Explanation (where required)                                                                                                                                                                                                                                                                                                                                                                  |
|--------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AA                 | Appropriate Assessment                              | An ecological assessment process prescribed by the EU Habitats Directive                                                                                                                                                                                                                                                                                                                      |
| CEMP               | Outline Construction Environmental Management Plan  | Document describing the proposed construction procedures and methodology that are proposed for this project including the construction sequencing and the methods employed at each stage including environmental controls                                                                                                                                                                     |
| dB                 | decibels                                            | -                                                                                                                                                                                                                                                                                                                                                                                             |
| EIA                | Environmental Impact Assessment                     | -                                                                                                                                                                                                                                                                                                                                                                                             |
| EIAR               | Environmental Impact Assessment Report              | A report prescribed by the EU EIA Directive                                                                                                                                                                                                                                                                                                                                                   |
| EPA                | Environmental Protection Agency                     |                                                                                                                                                                                                                                                                                                                                                                                               |
| GSI                | Geological Survey of Ireland                        |                                                                                                                                                                                                                                                                                                                                                                                               |
| IE Licence         | Industrial Emissions Licence                        | Licence under the Industrial Emissions Directive (2010/75/EU)                                                                                                                                                                                                                                                                                                                                 |
| IPPC Licence       | Integrated Pollution Prevention and Control Licence | Licence under the Integrated Pollution Prevention and Control Directive (2008/1/EC)                                                                                                                                                                                                                                                                                                           |
| IR                 | -                                                   | Intel utilise a sequential code numbering system for their facilities                                                                                                                                                                                                                                                                                                                         |
| KERs               | Key Ecological Receptors                            | -                                                                                                                                                                                                                                                                                                                                                                                             |
| mOD                | metres relative to Ordnance Datum                   | Vertical datum used by an ordnance survey as the basis for deriving altitudes on maps                                                                                                                                                                                                                                                                                                         |
| NIS                | Natura Impact Statement                             | A report carried as part of an AA process                                                                                                                                                                                                                                                                                                                                                     |
| NPWS               | National Parks and Wildlife Services                | -                                                                                                                                                                                                                                                                                                                                                                                             |
| NSL                | Noise Sensitive Location                            | -                                                                                                                                                                                                                                                                                                                                                                                             |
| OHL                | Overhead Line                                       | -                                                                                                                                                                                                                                                                                                                                                                                             |
| SAC                | Special Area of Conservation                        | A site protected by the EU Habitats Directive                                                                                                                                                                                                                                                                                                                                                 |
| SDS                | Safety Data Sheet                                   | Sheet of prescribed information on chemicals, describing hazards and chemical type, and giving information on handling, storage and emergency measures in case of an accident.                                                                                                                                                                                                                |
| SPA                | Special Protection Area                             | A site protected by the EU Birds Directive                                                                                                                                                                                                                                                                                                                                                    |
| SPL                | Sound Pressure Levels                               | -                                                                                                                                                                                                                                                                                                                                                                                             |
| WFD                | Water Framework Directive                           | Directive 2000/60/EC, was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in water bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present. |

|      |                            |                                                               |
|------|----------------------------|---------------------------------------------------------------|
| WWTP | Wastewater Treatment Plant | -                                                             |
| ZoI  | Zone of Influence          | distance over which potentially significant effects may occur |

# 1 INTRODUCTION

## 1.1 INTRODUCTION AND TERMS OF REFERENCE

### 1.1.1 GENERAL

Environmental Impact Services has been commissioned by Intel Ireland (Intel hereafter) to and prepare an Environmental Impact Assessment Report (EIAR) for the re-alignment of an overhead electricity power line, located to the east side and also located at adjacent properties north and south of their site at Collinstown Industrial Park, Leixlip, Co. Kildare.

The proposal provides for the diverting a section of the existing 110 kV double circuit overhead line (OHL) to the north of the River Rye, along the eastern edge of the Intel site at Collinstown, linking back into the existing overhead line section at the car park of the Lidl supermarket, directly south of the R148.

A full project description and details are contained in Chapter 4 of this EIAR *Project Description*. The Planning Application Report which accompanies the planning application contains further details, as do the applications drawings and other submitted documents.



Figure 1.1 Site location<sup>1</sup>

### 1.1.2 OBJECTIVES OF THIS EIAR

The core objectives of this EIAR are to predict any significant environmental impacts that are likely to occur due to the proposed development and, where applicable, propose measures to avoid, reduce or remedy them.

It reports on the findings of the EIA process to date and informs the Planning Authority (Kildare County Council), statutory consultees, other interested parties and the public in general about the likely effects of the project on the environment.

In doing this, the EIAR has been prepared in compliance with the EU Directive on EIA and the relevant domestic regulations. Chapter 2 *Screening & Scoping* provides details of the legislation that

has been followed and the guidelines that have been taken into account. It also discusses the relationship between this EIA and separate assessments prepared under other legislation.

## 1.2 FORMAT

This EIA follows what is referred to as a grouped format structure. Using this structure, the EIA examines each specialist environmental topic in a separate chapter. The chapters generally follow the format set out in Table 1.1 (below).

**Table 1.1 Typical structure of specialist chapters**

| Section                   | Notes                                                                                                                     |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Introduction/methodology  |                                                                                                                           |
| The proposed development  | including measures incorporated in the design to avoid, prevent or reduce environmental effects (design stage mitigation) |
| The receiving environment | the likely evolution of the environmental baseline in the absence of the proposed development                             |
| Predicted impacts         | focussing on impacts that are likely and significant                                                                      |
| Mitigation measures       | measures proposed as a result of the EIA process to reduce, remedy or offset predicted impacts, where required            |
| Residual impacts          | where relevant                                                                                                            |

Interactions between issues that arise in separate chapters are assessed as they occur in each chapter. Cumulative effects are similarly assessed as appropriate in the relevant chapters. The final chapter, *Interactions & Cumulative Effects*, shows where these interactions and cumulative effects have been identified and how they have been addressed.

Chapter 2 *Screening & Scoping*, gives more detail on the issues addressed under each heading.

Separate reports prepared in accordance with other (non-EIA) requirements include:

- Appropriate Assessment (AA) Screening Report
- Natura Impact Statement (NIS)
- Outline Construction Environmental Management Plan (CEMP)
- Planning Application Report
- Flood Risk Assessment
- Tree Survey Report

Some of these reports are also relevant in the consideration of the prescribed EIA topics so these are referred to in the EIA, as and where appropriate. For example, the Biodiversity chapter refers to the NIS.

The mitigation measures proposed in an EIA constitute important and enforceable undertakings about the details of how a project is developed and managed. For ease of comprehension – especially during the EIA process by consenting authorities – it has proven useful to have an overview of all of the measures that are proposed within the EIA to mitigate adverse effects. Appendix 1.1 provides a collection – or compendium – of all of the mitigation measures that are proposed.

## 1.3 STUDY TEAM

Table 1.2 Study team for EIAR

| Role                                                                                                                    | Personnel <sup>1</sup> | Company                          |                               |
|-------------------------------------------------------------------------------------------------------------------------|------------------------|----------------------------------|-------------------------------|
| Study Manager                                                                                                           | Paul Fingleton         | Environmental Impact Services    |                               |
| Study Coordinator                                                                                                       | Andrew Reynolds        | Environmental Impact Services    |                               |
| <b>Specialist Topics</b><br>(Chapter 2 <i>Screening &amp; Scoping</i> sets out the basis for selection of these topics) |                        |                                  |                               |
| Chapter                                                                                                                 | Part(s)                | Personnel                        | Company                       |
| <b>Population &amp; Human Health</b>                                                                                    | Main Author(s)         | Paul Fingleton & Andrew Reynolds | AOS Planning                  |
| <b>Biodiversity</b>                                                                                                     | Main Author(s)         | Shea O'Driscoll                  | Scott Cawley                  |
| <b>Land, Soils, Geology &amp; Hydrogeology</b>                                                                          | Main Author(s)         | Marcelo Allende                  | AWN Consulting                |
| <b>Water &amp; Hydrology</b>                                                                                            | Main Author(s)         | Marcelo Allende                  | AWN Consulting                |
| <b>Air Quality &amp; Climate</b>                                                                                        | Main Author(s)         | Niamh Nolan                      | AWN Consulting                |
| <b>Noise and Vibration</b>                                                                                              | Main Author(s)         | Leo Williams                     | AWN Consulting                |
| <b>Landscape &amp; Visual Impact</b>                                                                                    | Main Author(s)         | Conor Skehan                     | Environmental Impact Services |
|                                                                                                                         | Photomontages          | Micheál Garvey                   | -                             |
| <b>Material Assets</b>                                                                                                  | Main Author(s)         | Paul Fingleton & Andrew Reynolds | Environmental Impact Services |
| <b>Waste Management</b>                                                                                                 | Main Author(s)         | Chonail Bradley                  | AWN Consulting                |
| <b>Built Heritage</b>                                                                                                   | Main Author(s)         | James Kelly                      | Kelly & Cogan Architects      |
| <b>Archaeology</b>                                                                                                      | Main Author(s)         | Annette Quinn & Miriam Carroll   | Tobar Archaeology             |
| <b>Accident &amp; Disaster Risks</b>                                                                                    | Main Author(s)         | Paul Fingleton & Andrew Reynolds | Environmental Impact Services |
| <b>Interactions &amp; Cumulative Effects</b>                                                                            | Main Author(s)         | Paul Fingleton & Andrew Reynolds | Environmental Impact Services |

<sup>1</sup> The personnel named for each chapter / environmental factor have been the lead assessors for their chapters. They have each been responsible for the whole chapter which they prepared. Where other personnel made significant contributions, these are generally as described within the EIAR (including the Appendices).

**Study Manager, Paul Fingleton** has an MSc in Rural and Regional Resources Planning (with specialization in EIA), University of Aberdeen, 1990. Paul is a member of the International Association for Impact Assessment as well as the Institute of Environmental Management and Assessment. Paul has over twenty years' experience working in the area of Environmental Assessment. Paul has been involved in a diverse range of projects including contributions to, and co-ordination of, a number of complex EIARs, NISs and / or IPPCL Applications for projects.

**Study Coordinator - Andrew Reynolds** has a BSc in Environmental Planning and Management, Dublin Institute of Technology, 2015. Andrew has contributed to a number of complex Environmental Impact Statements, planning applications and environmental reports. He has experience working as part of team projects and in the preparation of EIA documents on behalf of multi-nationals and infrastructural providers for a diverse range of projects.

**Biodiversity - Shea O'Driscoll** a Senior Ecologist with Scott Cawley Ltd, holds an honours degree in Zoology from University College Dublin and a Masters in Advanced Wildlife Conservation in Practice from the University of the West of England, Bristol. Shea has professional experience working in South Africa and the United States, as well as more recent experience within Ireland and the UK. He has experience in habitat survey and assessment in a range of terrestrial and aquatic environments, surveys for protected species including otter, bats and badger, he has undertaken a number of ecological clerks of works roles as well as invasive species surveys for public infrastructure works across Ireland. Since joining Scott Cawley Ltd., Shea has been project manager on ecological assessments that include PEA, EcIA and AA Screening for a range of projects including tourism, industrial, residential and renewable energy developments.

**Biodiversity - Colm Clarke** is a Principal Ecologist with Scott Cawley and has over seven years' experience in ecological consultancy. He obtained an honours degree in Natural Sciences, with a specialisation in Botany, from Trinity College Dublin, and a Masters in Biodiversity and Conservation from the same institution. Colm is a full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM), and a member of the Irish Environmental Law Association (IELA). Colm's principal specialisms are in botany, and bats, although he also has experience in a range of other fauna surveys, including freshwater white-clawed crayfish, freshwater pearl mussel, badger and otter. Colm is experienced in the survey and assessment of a variety of EU Annex I habitat types from his time at Scott Cawley. Colm has been project manager and lead author on a large number of Ecological Assessments for Scott Cawley, spanning industrial facilities, residential development, transport infrastructure, and commercial developments. He has first-hand knowledge of the proposed development site, having completed surveys to inform this assessment and having worked on previous applications at Intel. He has extensive experience in AA, including the preparation of AA Screening reports, NIS and Natura Impact Reports (NIRs). Colm regularly completes technical review of documents both for colleagues and for clients. Colm acted as the first reviewer of this document.

**Land, Soils, Geology & Hydrogeology & Water & Hydrology – Marcelo Allende** is an Environmental Consultant at AWN with over 15 years of experience in Environmental Consulting and water resources. Marcelo holds a degree in Water Resource Civil Engineering from the University of Chile. He has worked on a wide of range of projects including multi-aspect environmental investigations, groundwater resource management, hydrological and hydrogeological conceptual and numerical modelling, Due Diligence reporting, surface and groundwater monitoring and field sampling programmes on a variety of brownfield and greenfield sites throughout Ireland as well as overseas in Chile, Argentina, Peru and Panama.

**Air Quality & Climate – Niamh Nolan** is an environmental consultant in the air quality section of AWN Consulting Ltd. She holds a BSocSci (Hons) in Social Policy and Geography from University College Dublin. She is an Associate Member of both the Institute of Air Quality Management and the Institution of Environmental Science. She has experience in mapping software primarily in QGIS and she specialises in the area of air quality, climate and sustainability.

**Noise & Vibration – Leo Williams** (Senior Acoustic Consultant) graduated from TCD with a BA, BAI (Mechanical and Manufacturing Engineering) and a MAI (Mechanical and Manufacturing Engineering). Leo is a Member of the Institute of Acoustics (IOA) and has extensive experience in environmental noise impact assessment, in particular industrial/manufacturing and renewable energy noise sources. He has experience in room and building acoustics modelling and assessment. He completed the IOA Diploma in Acoustics and Noise Control and is a registered sound insulation tester under the Sound Insulation Testing Register, Ireland (SITRI).

**Landscape and Visual Assessment – Conor Skehan** (BSC), (MLArch) Master of Landscape Architecture, University of Pennsylvania, 1983. Conor has been chartered by a number of professional Institutes including the International Association for Impact Assessment; the Irish Landscape Institute; the Royal Institute of the Architects of Ireland; and the Irish Planning Institute. He co-founded and served as President of the Irish Landscape Institute from 1993 to 1994. Environmental Impact Services is a Registered Assessor member of the Institute of Environmental Assessment (UK). Conor is an Architect, Landscape Architect, Strategic Planner, Impact Analyst, academic and writer. He has worked for over 30 years in many countries providing strategic and spatial planning and environmental consultancy to a wide range of government, public and private clients on assignments varying in scale from very large-scale infrastructural and industrial projects to large urban renewal and tourism projects. He has made significant contributions to a wide range of complex Environmental Impact Statements, planning applications and environmental reports for Industry (ICT, Bio-pharma), Infrastructure (road, rail, airport, port, power, energy waste, drainage and water supply), Institutions (hospital, prison projects) as well as major urban renewal and extension projects

**Waste Management – Chonail Bradley** BSc Environmental Science and is a Graduate Member of the Institute of Waste Management (GradCIWM). He is a Senior Environmental Consultant in AWN and has over 5 years' experience in environmental consultancy experience with 3+ years in waste management. He has helped coordinate and prepare multiple specialist inputs and EIA chapters including the Waste Management Chapters, Operational and C&D Waste Management Plans for numerous EISs/EIAs.

**Built Heritage - James Kelly** BArchSc DipArch MScUrd RIBA RIAI, is the Principal of Kelly and Cogan Architects and is Accredited as a Specialist Conservation Architect by the RIBA (equivalent to Grade 1 RIAI Conservation Accreditation). James has over 30 years' experience in the field of conservation and as well as directing and overseeing all projects in Kelly and Cogan Architects, lectures and engages in original research on Conservation in the Built and Urban Environment.

**Archaeology - Annette Quinn and Miriam Carroll** are the directors of Tobar Archaeological Services and both graduated from University College Cork in 1998 with a Masters degree in Methods and Techniques in Irish Archaeology. Both directors are licensed by the Department of Arts, Heritage and the Gaeltacht to carry out excavations and are members of the Institute of Archaeologists of Ireland. Annette Quinn and Miriam Carroll have been working in the field of archaeology since 1994 and have undertaken numerous projects for both the private and public sectors including excavations, site assessments (EIA/EIA) and surveys.

## 1.4 IMPACT PREDICTIONS

Rating of potential environmental impacts in the specialist chapters generally follows the hierarchy of Impacts contained in the EPA Guidelines<sup>2</sup> as shown in Table 1.3 below. This takes account of the quality, significance, duration and type of impact characteristic identified.

<sup>2</sup> Draft Guidelines on the information to be contained in Environmental Impact Statements. EPA, 2017 (Section 3.7.3 *Descriptions of Effects*). The 1992 Environmental Protection Agency Act (Section 72) provides for the preparation by the Environmental Protection Agency of guidelines on the information to be contained in an Environmental Impact Assessment Report. The Act further provides that those preparing and evaluating Environmental Impact Statements shall have regard to such guidelines.

**Table 1.3 Impact predictions<sup>2</sup>**

| <b>Impact Characteristic</b> | <b>Term</b>    | <b>Description</b>                                                                                                |
|------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------|
| Quality                      | Positive       | A change which improves the quality of the environment                                                            |
|                              | Neutral        | A change which does not affect the quality of the environment                                                     |
|                              | Negative       | A change which reduces the quality of the environment                                                             |
| Significance                 | Imperceptible  | An impact capable of measurement but without noticeable consequences                                              |
|                              | Slight         | An impact which causes noticeable changes in the character of the environment without affecting its sensitivities |
|                              | Moderate       | An impact that alters the character of the environment in a manner consistent with existing and emerging trends   |
|                              | Significant    | An impact, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment  |
|                              | Profound       | An impact which obliterates sensitive characteristics                                                             |
| Duration                     | Short-term     | Impact lasting one to seven years                                                                                 |
|                              | Medium-term    | Impact lasting seven to fifteen years                                                                             |
|                              | Long-term      | Impact lasting fifteen to sixty years                                                                             |
|                              | Permanent      | Impact lasting over sixty years                                                                                   |
|                              | Temporary      | Impact lasting for one year or less                                                                               |
| Type                         | Cumulative     | The addition of many small impacts to create one larger, more significant impact                                  |
|                              | 'Do Nothing'   | The environment as it would be in the future should no development of any kind be carried out                     |
|                              | Indeterminable | When the full consequences of a change in the environment cannot be described                                     |
|                              | Irreversible   | When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost    |
|                              | Residual       | Degree of environmental change that will occur after the proposed mitigation measures have taken effect           |
|                              | Synergistic    | Where the resultant impact is of greater significance than the sum of its constituents                            |
|                              | 'Worst Case'   | The impacts arising from a development in the case where the mitigation measures may substantially fail           |

## 1.5 DIFFICULTIES ENCOUNTERED

The EIA Regulations require that difficulties such as technical deficiencies, lack of information or knowledge encountered in compiling any specified information for the EIAR be described. In general, there were no significant difficulties encountered in the production of this EIAR. Any issues encountered during assessment of individual factors are noted within the specialist chapters.

## 1.6 LEVEL OF DETAIL IN PROJECT DESCRIPTION

Some of the information provided in Chapter 4 *Project Description* will be subject to slight changes for these reasons:

- All descriptions of proposed developments are approximations compared to the finished development. The nature of the construction process limits the amount of detail that is available at this planning consent stage to documentation that may be described as 'General Arrangement Illustrations'.
- An Outline Construction Environmental Management Plan (CEMP) is provided as a separate report. Some of the construction details will be a matter for the construction contractor(s) who will comply with all mitigation measures included in the Outline CEMP expect where modified by any future planning conditions. A more detailed description of the project's construction plan will be prepared prior to commencement of the works.

The project description details provided in Chapter 4 and in the specialist Chapters 5 to 16 are generally the outermost ('not to exceed') characteristics of the proposed development, that is maximum dimensions and emissions that could arise from the range of technologies and processes that could be employed. These are the characteristics that have potential to cause the biggest environmental effects. This facilitates an evaluation of 'worst case' environmental effects which is in keeping with the Guidelines and with best practice. Actual effects will not exceed the predicted effects. The the full range of methodologies, techniques, equipment, foundations and processes have been included and assessed to give flexibility to the contractor to select at detailed design stage when ground conditions are known.

## 1.7 A NOTE ON QUOTATIONS

By their nature, EIARs contain statements about the proposed development, some of which are positive, and some less than positive. Selective quotation or quotations out of context can give a misleading impression of the findings of the study. Therefore, the study team urge that quotations should, where reasonably possible, be taken from the conclusions of specialists' chapters or from the non-technical summary and not taken selectively or out of context.

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## 2 SCREENING & SCOPING

### 2.1 LEGISLATION AND GUIDANCE

EIAs are carried out in response to the requirements of the European Directive on the assessment of the effects of certain public and private projects on the environment, particularly as codified in Directive 2011/92/EU. This Directive was amended by Directive 2014/52/EU. The key amendments affecting the information to be contained in an EIAR are set out in Table 2.1 below.

The enabling statutory instruments (S.I.s) which transpose the Directive into law in Ireland are the European Communities (Environmental Impact Assessment) Regulations, 1989, as updated by the Planning and Development Acts 2000 to 2006 (the EIA Regulations), with the key legislation being the Planning and Development Regulations 2001 (S.I. 600/2001), as amended. These regulations prescribe the classes of projects subject to Environmental Impact Assessment (EIA).

The amendments introduced by Directive 2014/52/EU were transposed into Irish planning law by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (SI 296/18). These came into effect on 1 September 2018. They set out the statutory format and content for an EIAR.

This EIAR has been prepared in accordance with the above and has regard to other relevant regulations and guidance including *Guidelines on information to be contained in Environmental Impact Statements*, EPA, 2022, *Advice Notes on Current Practice in preparation of Environmental Impact Statements*, EPA, 2003 and relevant European Commission guidance documents<sup>3</sup>, as relevant.

This EIAR has due regard to the EPA Guidelines, particularly the information that is required to be contained in an EIAR to make it compliant with the current legislation (SI 296/18).

Other guidelines are referred to in specialist chapters, as listed in the introductory and methodology sections of chapters 5 to 16. These are mainly sectoral guidelines that relate to specific environmental factors. For example, guidelines by the Chartered Institute of Ecology and Environmental Management (CIEEM) are referred to in Chapter 6 *Biodiversity*.

A stage two Appropriate Assessment has been carried out to assess the potential of the proposal to affect the integrity of the Natura 2000 network. Its findings are provided in a Natura Impact Statement (NIS) which is included as a separately bound document within the planning application document set. The NIS is referred to in the biodiversity chapter of this EIAR as relevant, while avoiding duplication of its contents.

The relationship between this EIAR and other assessments prepared under separate legislation is discussed in Section 2.3.2.

## 2.2 SCREENING

The legislation<sup>3</sup> specifies classes of development and thresholds for determining which projects should be subject to EIA. Projects that fall into any of the specified classes or exceed the thresholds automatically require EIA. The legislation also sets out criteria for deciding whether 'sub-threshold' projects should be subject to EIA.

Part 1 of Schedule 5 to the Regulations include this project class:-

*20. Construction of overhead electrical power lines with a voltage of 220 kilovolts or more and a length of more than 15 kilometres.*

The proposed 110 kV OHL diversion project is below the voltage and length criteria for where EIA would be required under this project class.

Project Type 3(b) in Part 2 of Schedule 5 covers Energy Industry developments.

### *3. Energy Industry*

*(b) Industrial installations for carrying gas, steam and hot water with a potential heat output of 300 megawatts or more, or transmission of electrical energy by overhead cables not included in Part 1 of this Schedule, where the voltage would be 200 kilovolts or more*

At 110 kV, the proposed OHL diversion project is below the 200 kV voltage criterion given for project type 3(b). On the basis of the above analysis, the proposed development is considered as not corresponding to any project type contained in Schedule 5.

Because the proposed project does not correspond to any class or project type given in Parts 1 or 2 of Schedule 5 it is not 'sub-threshold development'.

Annex III of the EIA Directive (2011/92/EU, as amended) as transposed into Schedule 7 of the Planning and Development Regulations - sets out criteria for review of sub-threshold projects to determine if they should be subject to EIA. These criteria include characteristics, location and potential effects. As the proposed project is not 'sub-threshold', these criteria do not need to be applied.

Notwithstanding the above but taking into consideration the potential likely significant effects of the proposed development t, and taking account of consultation with the Planning Authority during informal pre-application consultation it has been decided to prepare an EIAR for the proposal.

## 2.3 SCOPING

### 2.3.1 BASIS OF SCOPING FOR THIS EIAR

Scoping is the process of identifying potential concerns that need to be examined in an EIAR. The determination of potential concerns to be addressed in this case was largely based on:

- the requirements of the EIA Regulations;
- the requirements of the EIA Directive;
- the Environmental Protection Agency's *Guidelines on the information to be contained in Environmental Impact Statements* (EPA, 2022) and *Advice Notes on Current Practice in the preparation of EISs* (EPA, 2003);
- the EIA team's experience of preparing and submitting previous EIARs.

<sup>3</sup> ref. s2.1

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The scoping process included circulation to and discussion of a scoping document (ref Appendix 2.1) with the Planning Authority. The chapters which follow all have regard to the requirements of the agreed scope. In keeping with best practice, the scope continued to be developed throughout the period of preparation of the EIA.

As noted in the scoping document, the amendments to the EIA Directive include a requirement to consider the potential for the proposal to give rise to or be affected by accidents or disasters. The accompanying Flood Risk Assessment Screening report (ref Section 2.3.2 below) finds that there are no significant flood risks associated with the proposal. The design of the development and all details during construction and operation will be required to comply with strict design and safety standards. Compliance with these standards will ensure that risks are avoided or managed with safeguards put in place where appropriate. There is no significant environmental risk arising from elements of the proposal which could cause, or be affected by, accidents or disasters. A review of other risks is nonetheless included as Chapter 16 of this EIA, to address requirement to consider risks to the environment due to accidents/disasters.

### **2.3.2 RELATIONSHIP BETWEEN THE EIA AND ASSESSMENTS UNDER OTHER EU DIRECTIVES AND LEGISLATION**

This EIA takes account of available results from other relevant assessments while avoiding duplication of those assessments, particularly the following:

#### **2.3.2.1 The Industrial Emissions Directive (2010/75/EU)<sup>4</sup>**

The Intel campus is subject to an Industrial Emissions (IE) licence (IEL code: P0807-07) from the EPA. The proposed development will not require any changes to the existing licence on the site.

Chapters 7 to 13 of this EIA (*Land, Soils, Geology & Hydrogeology, Water & Hydrology, Air Quality & Climate, Noise & Vibration and Waste Management*) refer to the relevant aspects.

#### **2.3.2.2 The Greenhouse Gas Emissions Directive (2003/87/EC)<sup>4</sup>**

The Intel site is subject to an EPA Greenhouse Gas Permit. Chapter 9 of this EIA discusses this under the heading of Air Quality & Climate

#### **2.3.2.3 The Habitats and Birds Directives (92/43/EEC and 79/409/EEC)<sup>4</sup>**

The proposal has been screened for requirement for a Natura Impact Statement (a.k.a. a Stage 2 Appropriate Assessment (AA) or a NIS) and this found an NIS to be required. Chapter 6, *Biodiversity*, takes account of the results of the NIS as relevant.

#### **2.3.2.4 The Waste Framework Directive (2009/9B/EC)<sup>4</sup>**

Chapter 13, *Waste Management* considers aspects which fall under this Directive, as appropriate.

#### **2.3.2.5 The Floods and Water Framework Directives (2007/60/EC and 2000/60/EC)<sup>4</sup>**

A Flood Risk Assessment screening report is included as part of the planning permission application documents. This follows the specific requirements of *The Planning System and Flood Risk Management - Guidelines for Planning Authorities* (OPW and the Department of the Environment and Local Government, 2009). Chapter 8, *Water & Hydrology*, has regard to requirements arising from these Directives as relevant.

<sup>4</sup> as amended

## 2.4 APPROACH TO EIA REQUIREMENTS INTRODUCED BY DIRECTIVE 2014/52/EU

**Table 2.1 Approach to EIA requirements introduced by Directive 2014/52/EU<sup>5</sup>**

| Relevant requirement                                                                                                                                                                                 | Notes / Approach in this EIA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Chapter / Document Reference(s)                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| description of reasonable, relevant alternatives                                                                                                                                                     | The alternatives are examined as reasonable in the context of the project requirements and site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Chapter 3<br><i>Consideration of Alternatives</i>                                        |
| mandatory implementation of mitigation and monitoring measures / requirement for incorporation of mitigation and monitoring measures in consents and ensuring that developers deliver these measures | Mitigation and monitoring measures proposed in the EIA are clearly set out both within the specialist chapters and as a separate compendium of mitigation and monitoring measures (Appendix 1.1). This facilitates their incorporation in the consent decision and post-consent implementation and auditing. Measures incorporated into the design to avoid or reduce potential effects are generally described as being part of the proposed development. Mitigation measures proposed after the assessment of impacts in each chapter are generally limited to measures to reduce, remedy or offset specific predicted impacts. Duplication of monitoring required under other EU legislation such as Waste or Industrial Emissions Licensing is avoided. | Chapters 5 to 16 of the EIA and Appendix 1.1<br><i>Compendium of Mitigation Measures</i> |
| addition of 'Land' as a prescribed environmental factor                                                                                                                                              | This aspect is described and addressed, primarily in terms of impact on availability of the land for other beneficial purposes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Chapter 7 <i>Land, Soils, Geology &amp; Hydrogeology</i>                                 |
| replacement of prescribed environmental factor of 'Human Beings' with 'Population and Human Health'                                                                                                  | Population is covered by a socio-economic assessment of the proposal. Human Health is addressed under the various factors through which effects on human health could be caused, e.g., Air Quality, Noise, Traffic by reference to relevant safety standards and hazard assessments, as discussed in Chapter 5.                                                                                                                                                                                                                                                                                                                                                                                                                                             | Chapters 5 to 13 and Chapter 16                                                          |
| the factor 'Flora & Fauna' is replaced by 'Biodiversity'                                                                                                                                             | This change in title aligns with current terminology and does not affect the scope of this factor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Chapter 6<br><i>Biodiversity</i>                                                         |
| streamlining                                                                                                                                                                                         | Relevant assessments carried out under other Directives are referred to as applicable.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                          |
| EIA quality / requirement for competent expertise                                                                                                                                                    | The team involved in preparation of this EIA are all appropriately qualified, experienced and expert in their respective fields. The competent expertise of all EIA contributors is set out at the beginning of the report.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Section 1.3 <i>Study Team</i>                                                            |
| demolition works                                                                                                                                                                                     | No demolition works are required.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                          |
| use of natural resources during construction and operation                                                                                                                                           | These are identified in the project description and assessed in the specialist chapters as relevant to the assessment of likely significant effects.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Chapter 4 <i>Project Description</i> and Chapters 5 to 13 as relevant                    |

<sup>5</sup> as set out in Appendix II of the draft *Guidelines on the information to be contained in EIAs* (EPA, 2017)

| Relevant requirement                                                                                    | Notes / Approach in this EIAR                                                                                                                                                                                                                      | Chapter / Document Reference(s)                 |
|---------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| impacts of climate change on the project as well as impacts of the project on climate change            | The principal potential effect of the project on climate would be through release of greenhouse gas emissions . This is addressed in Chapter 9 <i>Air Quality &amp; Climate</i> .                                                                  | Chapter 8 <i>Water &amp; Hydrology</i>          |
| risks to human health, cultural heritage or the environment (due for example to accidents or disasters) | Risks to human health, cultural heritage or the environment are addressed under the prescribed environmental factors. Risks due to accidents or disasters are addressed in the COMAH report and in Chapter 16 <i>Accident &amp; Disaster Risks</i> | Chapter 16 <i>Accident &amp; Disaster Risks</i> |

## 3 ALTERNATIVES

### 3.1 INTRODUCTION

Before looking at the impacts of any development on the environment, the 2018 regulations<sup>4</sup> require an EIA to include:

*A description of the reasonable alternatives studied by the person or persons who prepared the EIA, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.*

#### 3.1.1 GUIDELINES

The EPA Guidelines<sup>5</sup> give considerable coverage to alternatives, partly because the consultation about the effectiveness of EIA practice found that "the acceptability and credibility of EIA findings can be significantly affected by the extent to which this issue is addressed."

The Guidelines deal with the issue of alternatives under three key headings.

*The consideration of alternative routes, sites, alignments, layouts, processes, designs or strategies, is the single most effective means of avoiding environmental impacts. The acceptability and credibility of EIA findings can be significantly affected by the extent to which this issue is addressed.*

*However, it is important, from the outset, to acknowledge the existence of difficulties and limitations when considering alternatives. These include:*

- *Hierarchy*
- *Non Environmental Factors*
- *Site Specific Issues*

##### **Hierarchy**

*Many projects, especially in the area of public infrastructure, arise on account of plans, strategies and policies which have previously been decided upon. It is important to acknowledge that in some instances neither the applicant nor the competent authority can be realistically expected to examine options which have already been previously determined by a higher authority (such as a national plan or regional programme for infrastructure or a spatial plan).*

##### **Non-environmental Issues**

*EIA is confined to the environmental effects which influence the consideration of alternatives. It is important to acknowledge that other non-environmental factors may have equal or overriding importance to the developer, e.g., project economics, land availability, engineering feasibility, planning considerations.*

##### **Site Specific Issues**

*The consideration of alternatives also needs to be set within the parameters of the availability of land (it may be the only suitable land available to the developer) or the need for the project to accommodate demands or opportunities which are site specific. Such considerations should be on the basis of alternatives within a site e.g., design, layout.*

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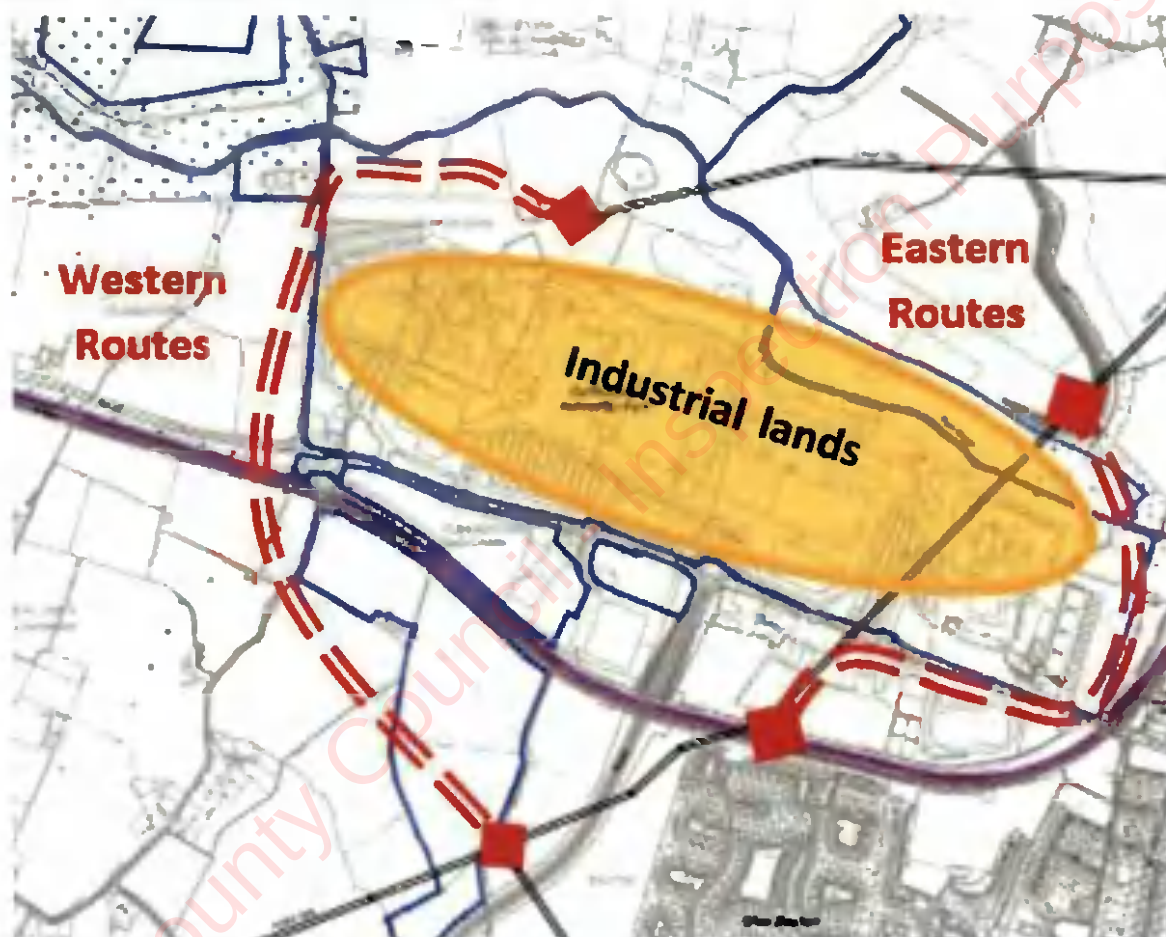
*For the purposes of the Regulations, alternatives may be described at three levels:*

1. *Alternative Locations*
2. *Alternative Designs*
3. *Alternative Processes*

For powerline projects the alternative routes, designs and processes are combined. This is because an overhead route and an underground route employ entirely different designs and processes – both of operation and construction.

## 3.2 ALTERNATIVE LOCATION

### 3.2.1 ALTERNATIVE STRATEGIES



**Figure 3.1 Two alternative location strategies**

A consideration of a wide range of alternatives is the best way to identify and to minimise the impact of powerline projects. These alternatives include both different routes, as well as different technologies, namely overhead lines (OHL) versus underground cables (UGC).

Two principal strategic options were identified– west or east of the existing industrial areas as well as one option U1 which passes through the site. Within these strategic options a range of Overhead Line (OHL) and Underground Cable (UGC) options were examined in detail.

### 3.3 ALTERNATIVE ROUTES

Ten alternatives were examined in detail. Six employed overhead line and associated processes, while four employed underground cables and associated processes. These were examined and assessed for compliance with a number of considerations, including environmental, as set out below.

#### 3.3.1 OVERHEAD LINE ALTERNATIVES



Figure 3.2 OHL Options O1, O2a, O2b, O2c, O2d O2e

Six overhead line options were examined along routes lying to the west and east of the exiting line.

Table 3.1 Alternative Overhead Line Routes

| Key | Description                                                                  | Reference                                                              |
|-----|------------------------------------------------------------------------------|------------------------------------------------------------------------|
| O1  | Diversion to connect with existing substation at Ryebrook                    | OHL Option O1 – Western Route                                          |
| O2a | Diversion within existing site to existing onsite mast                       | OHL Option O2a – Eastern Route, traversing site                        |
| O2b | Diversion west of onsite water tanks to existing mast north of the River Rye | OHL Option O2b – Eastern Route, traversing site & River Rye            |
| O2c | Diversion east of onsite water tanks to existing mast north of the River Rye | OHL Option O2c – Eastern Route, on berm, crossing River Rye            |
| O2d | Diversion east of site to existing mast north of the River Rye               | OHL Option O2d – Most Eastern Route on Intel lands, crossing River Rye |
| O2e | Diversion east of site to existing mast north of the River Rye               | Most Eastern Route outside Intel lands, crossing River Rye             |

### 3.3.2 UNDERGROUND CABLE ALTERNATIVES



**Figure 3.3 UGC Options U1, U2, U3, U4**

Four Underground cable [UGC] options were examined along routes lying to the west and east of the exiting line.

**Table 3.2 Underground Cable [UGC] OPTIONS U1, U2, U3, U4**

| Key       | Description                                                                                            | References                                           |
|-----------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| <b>U1</b> | Route through roads, parking & between buildings to Ryebrook Substation                                | UGC Option U1 – Western Route                        |
| <b>U2</b> | Route inside R148 boundary, between water tanks and berm and along existing boundary of developed area | UGC Option U2 – Eastern Route, on berm               |
| <b>U3</b> | Route west of berm; along berm edge and down and up valley slopes                                      | UGC Option U3 – Eastern Route, crossing River Rye    |
| <b>U4</b> | Route along south side of R148, Canal Bank and across fields                                           | UGC Option U4 – Most Eastern Route, along Canal Bank |

### 3.4 EVALUATION OF ALTERNATIVE ROUTES

A multi-criteria comparison<sup>6</sup> was been carried out to evaluate the short list of options and identify the best performing option.

The evaluation of the options uses a multi-criteria comparison against five main criteria;

<sup>6</sup> Based on EirGrid's Framework for Grid Development

- Planning Performance
- Environmental Performance
- Socio-economic Performance
- Deliverability
- Technical performance.

A description of the five criteria is outlined below.

### 3.4.1 PLANNING

- Conformity with relevant Guidance Documents
- Conformity with relevant National and Regional Planning Policy
- Conformity with Local Plans and Policies – land use and designations
- Conformity with pattern of development in the vicinity
- Consequences of a grant for the natural and heritage environment in the area, especially designations
- Consequences of a grant for the proper planning of the area, such as impacts on adjoining residents, land uses and designations
- Consequences of a grant for the sustainable development of the area

### 3.4.2 ENVIRONMENTAL

- *Biodiversity*: - Potential impacts on protected sites for nature conservation, habitats and protected species.
- *Hydrology & Hydrogeology*: - Potential impact on soils (geology, Irish geological heritage sites, etc) and water quality (of surface waters and groundwater).
- *Material Assets*: - Potential impact on land use
- *Landscape & Visual*: - Potential impacts on landscape constraints and designations and the potential impact on visual amenity.
- *Cultural Heritage*: - Potential for impacts on the cultural heritage resources – such as archaeology & architectural heritage
- *Noise & Vibration*: - Potential for vibration and noise impact of the development, taking into account sensitive receptors.

### 3.4.3 SOCIO ECONOMIC

- *Settlement & Communities*: - The expected impact of a grid development option on towns, villages and rural housing, and the way of life of their communities, residents, workers and visitors.
- *Recreation & Tourism*: - Impact on recreational activities (e.g. fishing, sports) and tourism during and after construction, that are not included in the other sub criteria.

### 3.4.4 DELIVERABILITY

- *Implementation Timelines*: - Relative length of time until energisation (assess significant differences).
- *Project Plan Flexibility*: - Does the project plan allow for some flexibility if issues arise during design and construction.
- *Permits & Wayleaves*: - Various permissions and wayleaves required to proceed to construction (e.g. number or level).
- *Design Complexity*: - Assessment of crossings, obstacles or constraints that may complicate or impact the design. The project should also comply with the specified ratings as provided by EirGrid.

### 3.4.5 TECHNICAL

- **Compliance with safety standards:** - The Project should comply with relevant safety standards such as those from the European Committee for Electrotechnical Standardisation (CENELEC). Materials should comply with IEC or CENELEC standards.
- **System Reliability:** - The average failure rates for the OHL or UGC can be calculated using, for example, estimated availability figures (unplanned outages/100 km/year), Mean Time to Repair (MTTR) and the length of the line or cable.
- **Expansion / Extendibility:** - This considers the ease with which the option can be expanded, i.e. it may be possible to uprate an OHL to a higher capacity or a new voltage in the future and the implications of UGC solutions should be considered in this regard.
- **Repeatability:** - This criterion examines whether this option can be readily repeated in the EirGrid network. For example, an OHL HVAC option is very repeatable, but a partially underground HVAC option is less repeatable as there can only be a certain amount of underground HVAC cable in each area of the network.
- **Technical Operational Risk:** - aims to capture the risk of operating different technologies on the network.

### 3.4.6 CRITERIA SCALE

The effect on each criteria parameter is presented along a range from "more significant"/"more difficult"/"more risk" to "less significant"/"less difficult"/"less risk". The following scale is used to illustrate each criteria parameter:

**Table 3.3 Scale of Assessment Criteria used**

| More significant/difficult/risk ← |      |                 | → Less significant/difficult/risk |       |       |
|-----------------------------------|------|-----------------|-----------------------------------|-------|-------|
| Dark Blue                         | Blue | Dark Green      | Green                             | Cream | White |
| Very High                         | High | Moderate - High | Moderate - Low                    | Low   | None  |

This scale is quantified by text for example mid-level (Dark Green), low-moderate (Green), low (Cream) or high (Dark Blue).

**High Risk for Planning Factors** means a low compliance with Development Plan Policies, Objectives or Zoning, while Low Risk means good compliance.

**High Risk for Environmental Factors** means a high potential to adversely affect the extent, integrity, character or stability of an environmental factor

**High Risk for Socio-economic** means a high potential to adversely affect amenities, business or economic activity in the locality.

**High Risk for Technical Operations** means the risk of construction or operating different technologies on the network or route.

### 3.5 EVALUATION CRITERIA APPLIED TO ALL UGG AND OHL OPTIONS

A detailed assessment of each route was carried out by examining the risk for each of the 20 criteria, namely for planning, environmental, socio-economic, deliverability and technical criteria. The results of this detailed examination are illustrated in Table 3.4, below. These are then further summaries, for clarity, in Table 3.5 on the following page that is used to identify the Emerging Best Performing Option [EBPO].

**Table 3.4 Summary Evaluation of all routes**

| Degree of Impact |                                           | Colour Code    | 01 | 02a | 02b | 02c | 02d | 02e | U1 | U2 | U3 | U4 |
|------------------|-------------------------------------------|----------------|----|-----|-----|-----|-----|-----|----|----|----|----|
|                  |                                           | Very High Risk |    |     |     |     |     |     |    |    |    |    |
|                  |                                           | High Risk      |    |     |     |     |     |     |    |    |    |    |
|                  |                                           | Moderate-High  |    |     |     |     |     |     |    |    |    |    |
|                  |                                           | Moderate-Low   |    |     |     |     |     |     |    |    |    |    |
|                  |                                           | Low Risk       |    |     |     |     |     |     |    |    |    |    |
| Planning         | P1 Conforms with Policy & Guidance?       |                |    |     |     |     |     |     |    |    |    |    |
|                  | P2 Conforms with Existing Patterns?       |                |    |     |     |     |     |     |    |    |    |    |
|                  | P3 Creates Impacts on Protected Features? |                |    |     |     |     |     |     |    |    |    |    |
| Environmental    | E1 Biodiversity Impact Potential?         |                |    |     |     |     |     |     |    |    |    |    |
|                  | E2 Soils & Water Impact Potential?        |                |    |     |     |     |     |     |    |    |    |    |
|                  | E3 Material Assets Impact Potential?      |                |    |     |     |     |     |     |    |    |    |    |
|                  | E4 Landscape Impact Potential?            |                |    |     |     |     |     |     |    |    |    |    |
|                  | E5 Cultural Heritage: Impact Potential?   |                |    |     |     |     |     |     |    |    |    |    |
|                  | E6 Noise Impact Potential?                |                |    |     |     |     |     |     |    |    |    |    |
| Socio-Economic   | S1 Settlement & Communities:              |                |    |     |     |     |     |     |    |    |    |    |
|                  | S2 Recreation & Tourism:                  |                |    |     |     |     |     |     |    |    |    |    |
| Deliverability   | D1 Implementation Timelines:              |                |    |     |     |     |     |     |    |    |    |    |
|                  | D2 Project Plan Flexibility:              |                |    |     |     |     |     |     |    |    |    |    |
|                  | D3 Permits & Wayleaves:                   |                |    |     |     |     |     |     |    |    |    |    |
|                  | D4 Design Complexity:                     |                |    |     |     |     |     |     |    |    |    |    |
| Technical        | T1 Compliance with safety standards:      |                |    |     |     |     |     |     |    |    |    |    |
|                  | T2 System Reliability:                    |                |    |     |     |     |     |     |    |    |    |    |
|                  | T3 Expansion / Extendibility:             |                |    |     |     |     |     |     |    |    |    |    |
|                  | T4 Repeatability:                         |                |    |     |     |     |     |     |    |    |    |    |
|                  | T5 Technical Operational Risk:            |                |    |     |     |     |     |     |    |    |    |    |

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## 3.6 EMERGING BEST PERFORMING OPTION

### 3.6.1 INTRODUCTION

The following sections sets out the considerations that have led to the identification of an Emerging Best Performing Option (EBPO). A summary matrix for the options is provided in Table 3.5 below:

**Table 3.5 Risk Summary Matrix for Route Options**

|                     | O1                 | O2a                | O2b                | O2c                | O2d                | O2e            | U1                 | U2                 | U3                 | U4                 |
|---------------------|--------------------|--------------------|--------------------|--------------------|--------------------|----------------|--------------------|--------------------|--------------------|--------------------|
| Planning            | High Risk          | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Very High Risk | Moderate-High Risk | Moderate-High Risk | Very High Risk     | High Risk          |
| Environmental       | High Risk          | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Very High Risk | Moderate-High Risk | Moderate-High Risk | Very High Risk     | High Risk          |
| Socio-Economic      | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Very High Risk | Moderate-High Risk | Moderate-High Risk | Very High Risk     | High Risk          |
| Deliverability      | Very High Risk     | Very High Risk     | Very High Risk     | Very High Risk     | Moderate-High Risk | High Risk      | Very High Risk     | Very High Risk     | Very High Risk     | Very High Risk     |
| Technical           | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | High Risk      | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk |
| Overall Performance | High Risk          | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | Moderate-High Risk | High Risk      | Moderate-High Risk | Moderate-High Risk | Very High Risk     | High Risk          |

| Degree of Impact   | Colour Code |
|--------------------|-------------|
| Very High Risk     | Black       |
| High Risk          | Dark Blue   |
| Moderate-High Risk | Green       |
| Moderate-Low Risk  | Light Green |
| Low Risk           | White       |

### 3.6.2 EMERGING BEST PERFORMING OPTION (EBPO)

Identification of the EBPO has considered and balanced the five key criteria: planning, environmental, technical, socio-economic, deliverability and technical.

The summary matrix shows that option O1 and U4 are deemed the highest risk options for both technologies. Option O1 is highly constrained by major crossings: R449, R148, railway, Royal Canal and the River Rye. The route also transverses the protected area of Carton Demesne. Considering the significant crossings, protected area, necessary wayleaves and consents, this route would be overly challenging to deliver and construct. For this reason, option O1 is high risk for implementation and deliverability.

For option U4, the majority of the route is along the Royal Canal towpath and within a SAC. This results in a complex installation which increases technical, planning and environmental risks for construction impacts, such as stability of the embankment or silt run-off into the SAC. The narrowness of the construction swathe in the towpath also increases the complexity of the installation. The route needs to cross water courses and existing services which increases the difficulty for installation. For these reasons, option U4 is high risk for implementation and deliverability.

Options O2a, O2b, and O2c are similar routes with similar challenges that vary mainly in degree. These routes perform better than other options for planning, environmental and social-economic criteria. However, these options are constrained by the existing infrastructure and services installed on the campus. For this reason, these options are unlikely to be feasible from a constructability perspective and even though the options perform well under planning, environmental and social-economic criterion, the options are considered high risk in terms of deliverability and are not considered viable options. Option O2e remains outside to the campus to avoid these challenges of existing infrastructure, but it performs far worse on environmental and planning criteria because of increased proximity to sensitive receptors.

Similar observations have been made for the UGC routes. Options U1, U2, and U3 have significant challenges in terms of deliverability. These routes perform better than other options for planning, environmental and social-economic criteria. However, these options are constrained by the dense

patterns of existing infrastructure and services concentrations installed within the campus. For this reason, these options are unlikely to be feasible from a constructability perspective and even though the options perform well under planning, environmental and social-economic criterion, the options are considered high risk in terms of deliverability and are not considered viable options.

The summary matrix for options indicates reduced, but not negligible, risks associated with OHL option O2d under the deliverability performance criterion. Although this option has moderate to high risks for planning, environmental and social-economic criteria, the route is more feasible in comparison to the other options, because it equally minimises constraints due to technical, environmental and planning criteria by availing of the screening offered by being located between the perimeter eastern berm and the mature hedgerow that lies to the east of this.

### 3.6.3 BEST PERFORMING OPTION

For these reasons and having considered the outcomes of the assessment process from a multi-criteria perspective, the EBPO option O2d has been identified as the overall EBPO for the line diversion project at Intel

OHL option O2d was identified as the EBPO and was brought forward for development and fully assessed as part of any planning application.

Further detail on the Alternatives can be found in Appendix 3.1 of this EIAR.

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## 4 PROJECT DESCRIPTION

### 4.1 INTRODUCTION

This chapter describes the nature and scale of the development proposed.

### 4.2 DESCRIPTION OF SITE AND SURROUNDINGS

#### 4.2.1 THE SITE

The locations of the proposed development is to the east side at their site and also located at adjacent properties north and south of their site at Collinstown, Leixlip, Blakestown, Kellystown, Collinstown Industrial Park, Leixlip, Co. Kildare.

The campus covers an area of ca. 160 hectares, roughly bounded by the Sligo to Dublin railway line and the Royal Canal to the east, by the R148 Leixlip to Maynooth Regional Road to the south, by a local road called Kellystown Lane to the west and by the Rye Water river to the north. The R449 Regional link road leads from the south of the site to the M4 motorway as illustrated in Figure 1.1.

#### 4.2.2 CONTEXT

The campus is a large, highly complex industrial facility which is constantly evolving to address advances in manufacturing technology. The history of recent planning applications is given in the accompanying Planning Application Report.

### 4.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

#### 4.3.1 GENERAL DESCRIPTION

The proposed development consists of the realignment of an approximate 1.1 km section of existing double circuit overhead line which supports the existing Maynooth-Ryebrook and Dunfirth-Kinnegad-Rinawade 110kV overhead line circuits.

The proposed development comprises of the following:

- Diverting a section of the existing 110 kV double circuit overhead line to the north of the River Rye, along the eastern edge of the Intel site at Collinstown, linking back into the existing overhead line section at the car park of the Lidl supermarket, directly south of the R148.
- The decommissioning and removal of 4 No existing double circuit steel lattice towers and associated electrical conductors to include the removal of the existing towers and associated electrical conductors from site.
- The installation of 7 No new double circuit steel lattice towers. Two of these will be replacement towers (Towers T1 & T7). The towers will range in height from approximately 20.75 m to approximately 39.75 m above ground level and will support six electrical conductors (overhead lines).
- All ancillary site development, preparation and reinstatement works, including access, landscaping and connection to existing services and utilities and miscellaneous site works

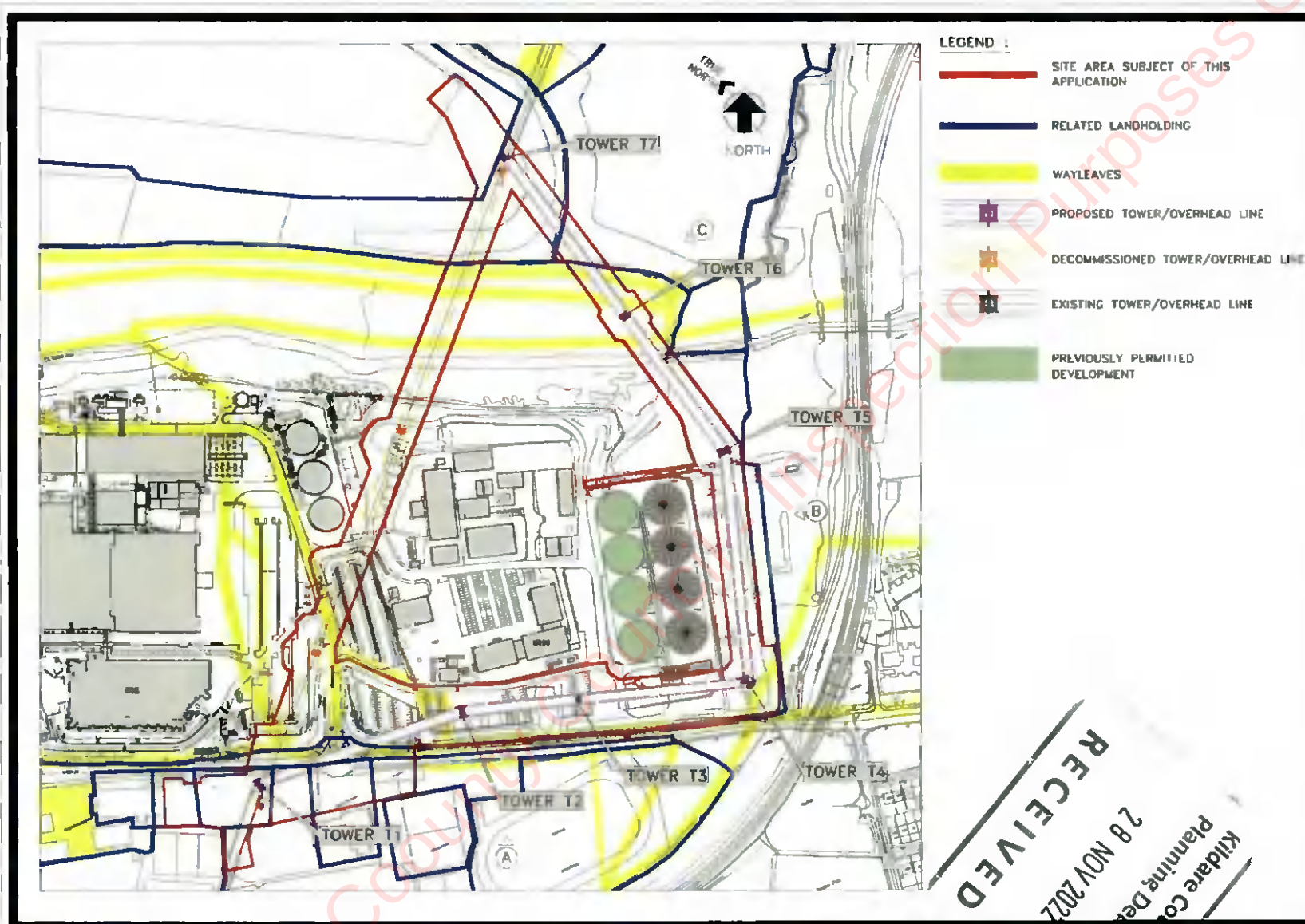


Figure 4.1 Proposed Route Layout

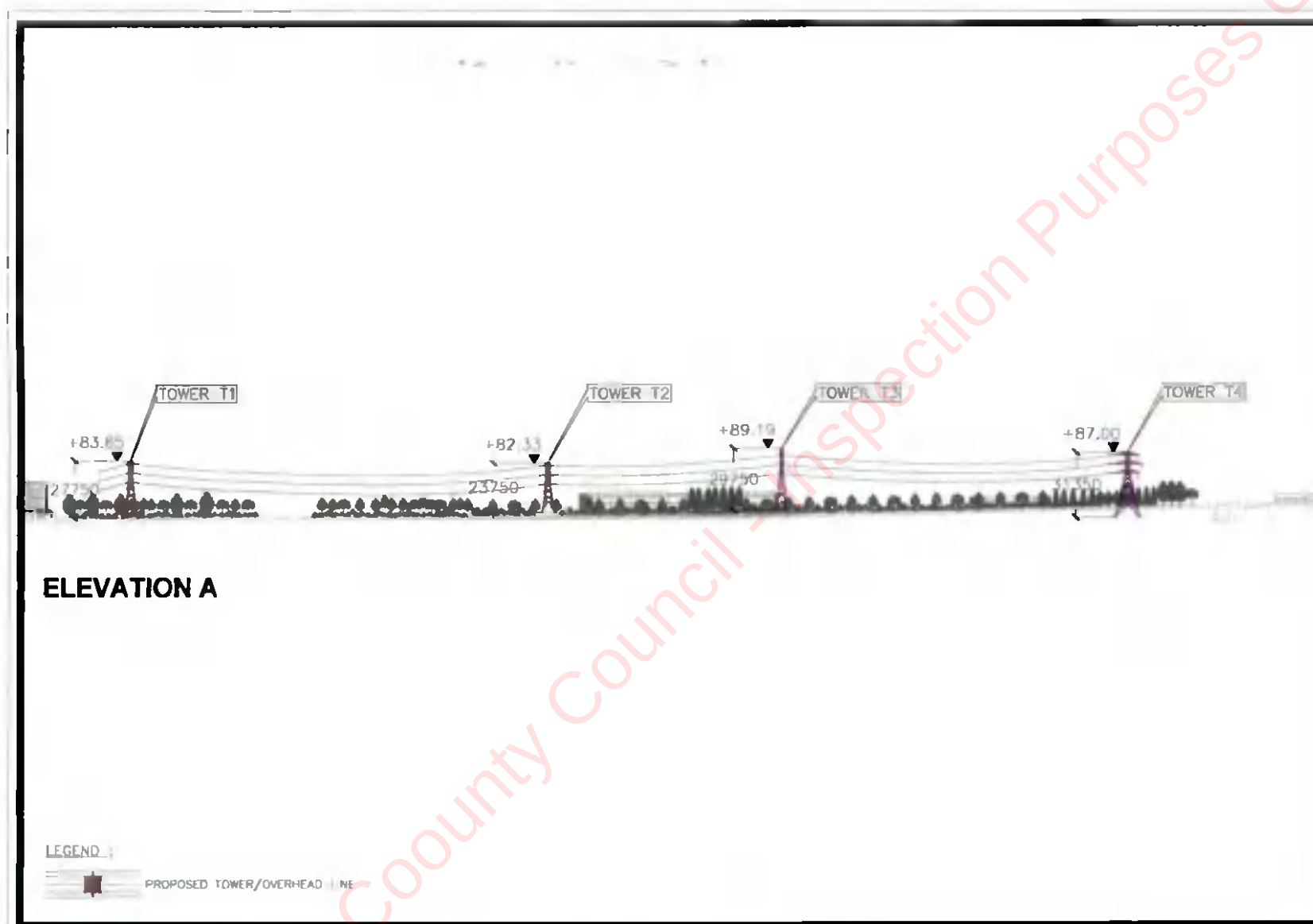


Figure 4.2 Proposed Elevations (A-A)

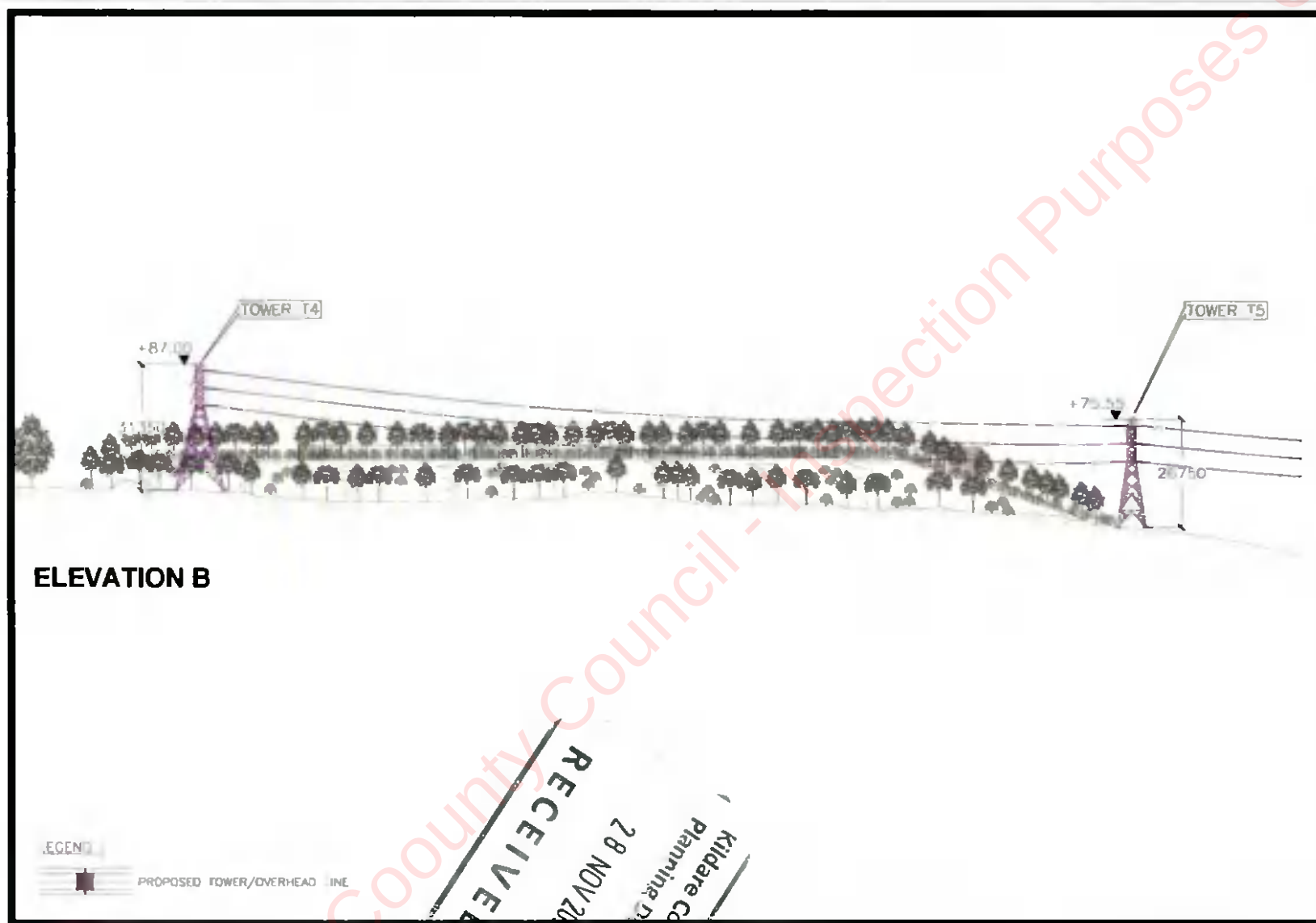
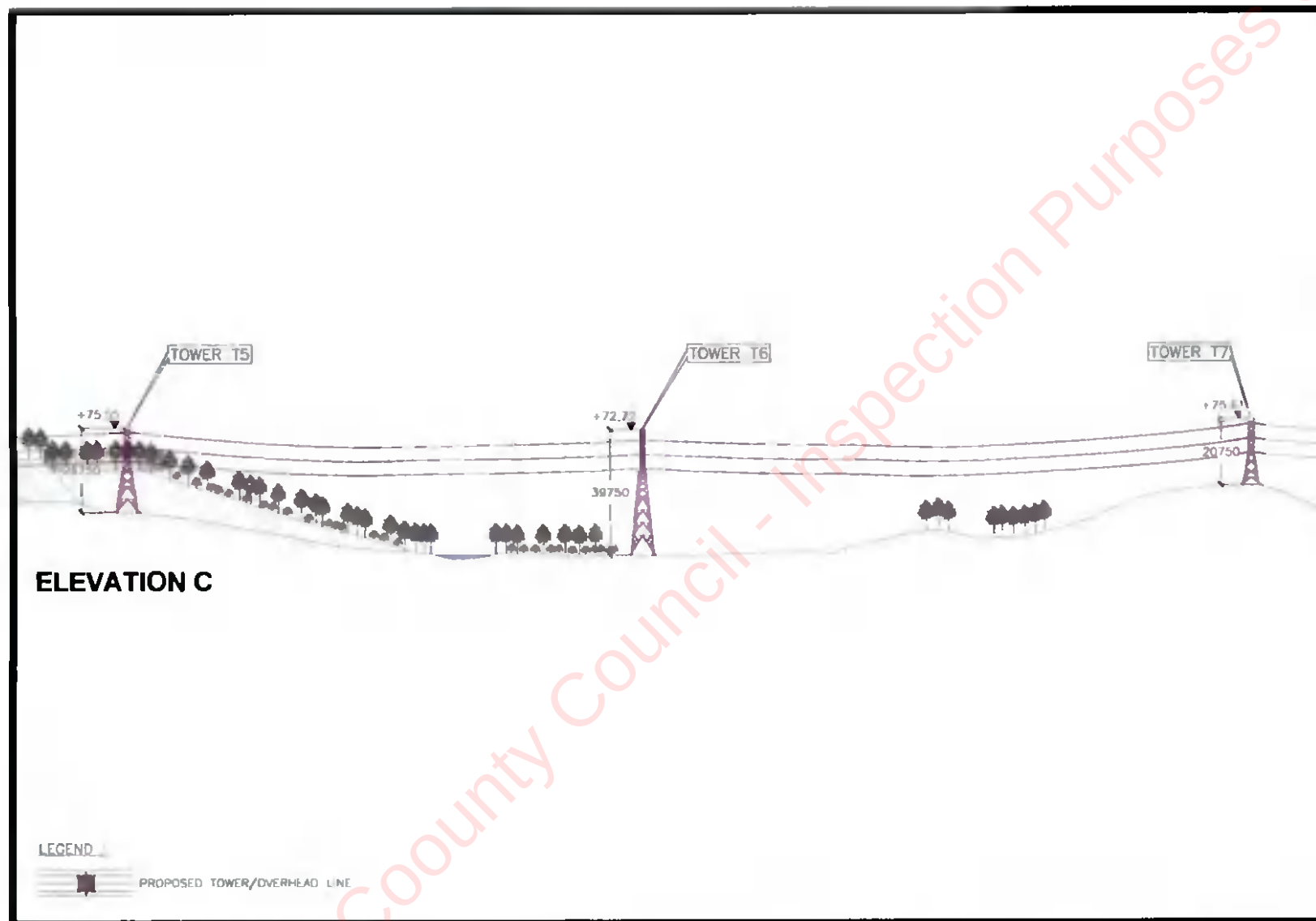


Figure 4.3 Proposed Elevations (B-B)



**Figure 4.4 Proposed Elevations (C-C)**

## 4.4 CONSTRUCTION

It is envisaged that the construction of the facilities will take approximately 6 to 8 months. An Outline Construction Environmental Management Plan (CEMP) accompanies this application describes the proposed construction procedures and methodology that are proposed.

This plan describes the construction sequence including site preparation, foundation works, tower construction & erection, conductor stringing/OHL installation, land reinstatement and the methods employed at each stage including environmental controls.

It shows that the construction material storage yard will be located in a designated area of Intel's car park close to IR96 ground floor main contractor area. All the required equipment's and materials will be stored there. This yard will provide secure storage for all materials related to the proposed development's construction, as well as personnel parking, temporary site offices, and welfare amenities.

This area will minimise the site establishment requirements at each of the tower locations and seeks to limit the work area required. Materials will be transferred to the tower location as required by low loader. Minor welfare facilities such as mobile portaloos will be provided at tower locations while construction work is in progress at each site.



**Figure 4.5 Indicative contractor areas**

#### 4.5 PROTECTION OF THE ENVIRONMENT DURING OPERATION

Specific aspects of the operation of the development are described in the relevant chapters of this EIA, Appendix 1.1 of the EIA and accompanying documents, including Section 5 of the Outline CEMP.

## 5 POPULATION & HUMAN HEALTH

### 5.1 INTRODUCTION

This chapter considers the impact of the proposed development in the context of population and settlement, land use, employment, other impacts of a social and economic nature and human health. In terms of population, the types of issues which developments such as this raise (both during construction and operation) include: impacts on amenities and services in the area; additional economic opportunities; increased traffic; and impacts on existing land uses. The assessment of impacts on human health draws on and refers to the other parts of the EIAR which address impacts on the vectors through which health could be directly or indirectly affected, including air quality, noise, water quality and traffic.

### 5.2 THE PROPOSED DEVELOPMENT

The development will not employ additional operational staff. It will also not employ additional construction workers, rather construction personnel from within the existing sustaining construction staff (the Intel site normally has a sustaining construction population of 300-500 workers at any given time) will be utilised for the proposed development. Construction programme will be dependent on emerging campus needs. It will take a minimum of approximately 3 years and a maximum of 10 years

A full development description is included in Chapter 4 *Project Description* of this EIAR and in the Planning Report which accompanies this application.

### 5.3 THE EXISTING ENVIRONMENT

#### 5.3.1 PLANNING AND DEVELOPMENT CONTEXT

Intel's lands at Collinstown are situated directly to the west of the town of Leixlip in County Kildare. Leixlip is a settlement of approximately 15,500 inhabitants located approximately 15 km west of Dublin City Centre. Leixlip is recognised as a 'Large Growth Town II' in the settlement hierarchy within the Kildare County Development Plan.

The Intel campus is situated on a ca. 160-hectare site to the west of Leixlip at the Collinstown Industrial Park. The campus is one of the largest single manufacturing facilities in Ireland and currently employs in the region of 4,500 people.

The campus (within which the proposal is located) is roughly bounded by the Sligo to Dublin railway line and the Royal Canal to the east, by the R148 Leixlip to Maynooth Regional Road to the south, by a local road called Kellystown Lane to the west and by the Rye Water river to the north. The R449 Regional link road leads from the south of the site to the M4 motorway.

#### 5.3.2 LAND USE STRUCTURE ADJACENT TO THE SITE

The predominant land use for the Intel campus is for the manufacture of semi-conductor integrated circuits which are used in the production of computer processing chips. This use was first established with the construction of the first 'Electronics Systems Manufacturing and Assembly Industry' building (IR17) in 1990.

Primary land uses surrounding the campus include: largely undeveloped rural / agricultural land uses to the north, west and southwest; low intensity recreational uses associated with the Leixlip

<sup>7</sup> Intel utilise a sequential code numbering system for their facilities.

Amenities Centre and Leixlip United Football Club to the southeast as well as low to medium density residential uses to the south and east in the direction of Leixlip. A new temporary primary school is also located on the grounds of the Leixlip Amenities Centre.

The subject lands lie within the functional area of Kildare County Council. The surrounding land uses are largely reflected in the zoning categories for the area set out in the Kildare County Development Plan (CDP) as well as the Leixlip Local Area Plan (LAP), all of which place considerable emphasis on the continuing development of Intel manufacturing activity at the campus. (Detailed information on the planning and development context of the Intel campus is provided in the Planning Report which accompanies this application).

### 5.3.3 SOCIO-ECONOMIC FACTORS

As has been discussed previously, the site forms part of the larger campus. It is located ca. 2 km to the west of Leixlip Village and within 5.5 km of a number of other settlements including Maynooth, Lucan and Celbridge. This area can be regarded as the immediate hinterland in terms of socio-economic impacts arising from the new development.

The secondary hinterland can be regarded as the Greater Dublin Region as direct and indirect employment, purchasing, residences etc. are likely to be located throughout the Dublin Region and beyond.

The following socio-economic analysis concentrates mainly on the immediate hinterland<sup>8</sup> in terms of population and employment as this is the area where most impacts will arise. It also includes an analysis of the secondary hinterlands in terms of population and employment.

### 5.3.4 POPULATION

#### 5.3.4.1 Population Change

In terms of the County, Region and State, population change is strongly influenced by migration and emigration rates, rather than birth and death rates. The 1990's and early 2000's saw a large movement of people into the Country due to the "economic boom" in Ireland. The subject region and surrounding areas experienced very high levels of population growth as a result of strong economic growth in the region. Within the period from 2008/2009 to 2014, there was a decline in economic growth and a return to emigration of people from Ireland. Economic indicators show that this trend has again reversed and signals of demand for skilled workforce and economic growth have returned.

2011 and 2016 Census figures indicate that the population of the region as a whole continued to grow at rate in excess of that experienced in the State as a whole, a 5.7% increase at regional level compared to a 3.8% increase at state level. In particular, Dublin, Meath and Kildare experienced continued substantial growth, with the hinterland of Intel experiencing the largest growth of all, and were all above the national average of 3.8% (see Table 5.1 below). These areas are from where construction personnel of the development will most likely originate as there will be no new employment due to this proposal.

Table 5.1 below shows the changes in population for the state, immediate and secondary hinterlands of the proposed development.

<sup>8</sup> The immediate hinterland is considered to be approximate to the Electoral Division (ED) of Leixlip itself as well as the adjoining 7 EDs of Blanchardstown – Blakestown, Lucan North, Lucan St. Helen's, Donaghcumper, Celbridge, Maynooth and Dunboyne.

**Table 5.1 Population Change at State, Secondary and Immediate Hinterland Level<sup>6</sup>**

| Area                         | Population 2011 | Population 2016 | Increase | % Increase |
|------------------------------|-----------------|-----------------|----------|------------|
| Total State                  | 4,588,252       | 4,761,865       | 173,613  | 3.8        |
| Greater Dublin Area          | 1,804,156       | 1,907,332       | 103,176  | 5.7        |
| Dublin (4 Local Authorities) | 1,273,069       | 1,347,359       | 74,290   | 5.8        |
| Meath                        | 184,135         | 195,044         | 10,909   | 5.9        |
| Wicklow                      | 136,640         | 142,425         | 5,785    | 4.2        |
| Kildare                      | 210,312         | 222,504         | 12,192   | 5.8        |
| Hinterland of Intel          | 106,690         | 114,566         | 7,876    | 7.4        |

With regard to population growth in the immediate hinterland of Intel, Table 5.1 indicates that the total population of the seven EDs in the immediate hinterland grew by a total of 7,876 or 7.4% in the intercensal period 2011-2016.

This level of growth can be seen to be above the levels of population growth experienced both nationally and regionally and is indicative of strong economic activity in the area.

### 5.3.5 TOURISM, AMENITIES AND RECREATION

The Kildare County Development Plan 2017-2023 identifies Carton House, located to the north west of the proposed development site, as a tourism facility of national and international significance. The Royal Canal running adjacent to the south of the larger Intel site is an important amenity route for cycling and walking. In addition to this a mixture of sports facilities are located to the south-east of the site including soccer pitches (Leixlip United), an amenity centre, tennis courts and an athletics track.

## 5.4 PREDICTED IMPACTS

### 5.4.1 INTRODUCTION

The proposed development consists of site services infrastructure on industrial zoned land in the existing Intel Campus. The following sections will address how the proposed development could impact on population and human health during the construction and operational phases of the development.

### 5.4.2 POPULATION

Despite the intermediate economic decline experienced in Ireland from 2008, population projections indicate that population growth in the Immediate and Secondary Hinterland areas is expected to remain as shown in Section 5.3.4. Site services infrastructure development, such as that of the proposal, will position the Intel site to meet new/ emerging requirements, and also accommodate the updating of new technologies and processes on the Intel Campus, and therefore would contribute towards further environmental compliance and on-site operation efficiency. This would contribute to the maintenance of the population within ED's such as those of Leixlip, Maynooth and Celbridge where the subject proposal is located within and in close proximity through the continued enhancement of on-site services and therefore enabling the continued efficient operation and associated productivity of the Intel Campus.

### 5.4.3 EMPLOYMENT

The proposal itself will not generate any additional employment, however construction personnel from within the existing sustaining construction staff on the Intel Campus (the Intel site normally has a sustaining construction population of 300-500 workers at any given time) will be utilised to undertake the proposed development.

#### 5.4.4 IMPACTS ON TOURISM, AMENITIES & RECREATION

The Kildare County Development Plan 2017-2023 identify Carton Estate to the west of the Intel campus as a tourism facility of national and international significance with strategic tourism potential. Another important recreational amenity in the area is the Royal Canal which runs to the south of the Intel campus. The Canal crosses the Rye Water by means of an impressive aqueduct adjacent to Leixlip Spa. Recreational facilities are also located to the south east of the site consisting of multiple playing pitches and training facilities.

The relevant chapters of the EIA discuss issues relating to tourism, heritage, amenity and recreation in greater detail. Cultural & Architectural Heritage and Archaeology are discussed in Chapters 14 and 15 respectfully; Nature Conservation Areas are discussed in Chapter 6 *Biodiversity*; Chapter 7 details *Land, Soils, Geology & Hydrogeology*; and Scenic Views and the landscape are discussed in detail in Chapter 11 *Landscape & Visual Impact*. Due to the location and well-screened nature of the site, it is not anticipated that there will be any significant impacts on tourism, heritage, amenity and recreation in the area during the operation of this development. The land use on site is well established and the proposed development will remain within the existing site and will not result in any additional impacts on the tourism, heritage, amenity and recreation of the surrounding area.

#### 5.4.5 HUMAN HEALTH

In an EIA, the potential for effects on human health are dealt with under the more specific topics of the environmental medium by which it might be caused. The topics include air, water, noise traffic and waste.

Some health and safety related topics are covered by separate and more specific legislation and so do not form part of an EIA – examples include worker health and safety and construction safety.

In terms of air, Chapter 9 *Air Quality & Climate* of the EIA concludes that no residual impacts in terms of air quality are anticipated. The proposed design includes environmental control measures to ameliorate any potential negative impacts on the air environment. During the operational phase, the Intel facility strictly operates under an environmental management system and in compliance with the IED licence requirements for the facility.

Water and Hydrology is covered in Chapter 8 of the EIA. The implementation of the design environmental controls and monitoring measures outlined within Chapter 8 will ensure that impacts on surface water during the construction phase will be imperceptible. During the operational phase of the development, the proposed development will be required to operate in compliance with IED licence requirements which will minimise any risk of a water quality impact and will ensure that residual impacts are imperceptible. As there will be no change to the permitted water supply and wastewater loading during construction or operation, the residual impact will be imperceptible.

Chapter 10 of the EIA outlines that there will be some impact on nearby noise sensitive properties due to noise emissions from site traffic and other activities during the construction phase of the project. The application of noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum and within acceptable limit values. Construction noise related impacts will be short term. During the operation phase of the development noise and vibration control measures will be employed in order to ensure that noise emissions from building services plant do not exceed the relevant criterion at nearby noise sensitive locations. The noise impact related to the development will remain within the acceptable limit values.

The assessment undertaken as part of the Construction Traffic Management & Logistics Plan, indicates that during the peak construction phase of the proposed development, for a worst case scenario of overlap with other construction activity at Intel, there would be a modest temporary increase in traffic and resulting impact on the receiving road environment.

The impact of the traffic generated by the proposed development will have no significant effects on the amenity of the area following the implementation of mitigation measures. The provision of a Construction Traffic Management Plan will mitigate and reduce the environmental impacts of the construction phase of the development. Furthermore, the existing active mobility management plan highlights available travel options to contractors, monitor travel patterns and minimise the impact of future travel levels.

Within regards to waste, Chapter 13 of the EIA the potential effect of construction waste generated from the proposed development is considered to be short-term, neutral and not-significant. The impact of waste generation as a result of the operational phase of the development is considered to be long-term, neutral and not-significant.

## **5.5 MITIGATION MEASURES**

### **5.5.1 GENERAL**

No specific mitigation measures are required to ameliorate the impacts on human beings. Mitigation measures in relation to the potential human health impacts of air and noise, particularly during construction are dealt with in detail in Chapter 9 and 10 of the EIA. Chapter 7, 8 and 13 provide specific mitigation measures with regards to soil, water and waste respectfully. Such measures relate only to the avoidance, reduction or remedy of impact, which affect human beings.

## **5.6 RESIDUAL IMPACTS**

The proposed development will have a positive long-term impact on the immediate hinterlands of Intel and also the secondary hinterlands of County Kildare and the Greater Dublin Area region through continued efficient operation of the Intel Campus and the associated economic and social benefits

## 6 BIODIVERSITY

### 6.1 INTRODUCTION/METHODOLOGY

This chapter assesses potential impacts that may arise from the proposed development on biodiversity within the receiving environment in accordance with the guidance documents discussed in Section 2.1 and:

- Guidelines for Ecological Impact Assessment in the UK and Ireland, Chartered Institute of Ecology and Environmental Management (CIEEM), 2018.



**Figure 6.1 Location of the Proposed Development site within the surrounding environment**

The aims of this assessment include:

- Establish baseline ecological data for the proposed development site and other relevant areas;
- Determine the ecological value of the identified ecological features;
- Assess the impact of the proposed development on ecological features of value; and whether these impacts result in significant direct or indirect effects;
- Recommend mitigation measures to avoid, reduce and remedy the identified impacts; and,
- Identify any residual impacts after mitigation.

#### 6.1.1 STUDY METHODOLOGY

##### 6.1.1.1 Planning, Policy and Legislation

The assessment of the likely impacts of the proposed development on ecological resources has considered legislation, policy documents, and guidelines outlined in the following section.

### International and National Legislation

The following international legislation has been considered in respect of the Proposed Development:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter, referred to as the 'Habitats Directive'. The Habitats Directive is the legislation under which the Natura 2000 network<sup>9</sup> was established and Special Areas of Conservation (SACs) are designated for the protection of natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of that directive.
- Directive 2009/147/EEC; hereafter, referred to as the 'Birds Directive'. The Birds Directive is the legislation under which Special Protection Areas (SPA's) are designated for the protection of endangered species of wild birds listed in Annex I of that directive.
- Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy (hereafter referred to as the Water Framework Directive (WFD));

The following national legislation has been considered in respect of the Proposed Development:

- Wildlife Acts 1976 to 2021; hereafter collectively referred to as the 'Wildlife Acts'. The Wildlife Act and subsequent amendments is the principal piece of legislation at national level for the protection of wildlife and for the control of activities that may harm wildlife. All bird species, 22 other animal species or groups of species, and 86 species of flora are protected under this legislation.
- Planning and Development Act 2000 (as amended); hereafter collectively referred to as the 'Planning and Development Acts'. This piece of legislation is the basis for Irish planning. Under the legislation, development plans (usually implemented at local authority level) must include mandatory objectives for the conservation of natural heritage and for the conservation of European Sites. It also sets out the requirements in relation to environmental assessment with respect to planning matters, including transposition of the Habitats and Birds Directive into Irish law.
- European Communities (EC) (Birds and Natural Habitats) Regulations 2011 to 2015; hereafter the 'Birds and Habitats Regulations'. This legislation transposes the Habitats and Birds Directives into Irish law. It also contains regulations (49 and 50) that deal with invasive species (those included within the Third Schedule of the regulations).
- Flora (Protection) Order, 2022. This lists species of plant protected under Section 21 of the Wildlife Acts.
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EIAR). (EPA, 2022).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. August 2018. (Department of Housing, Planning and Local Government, 2018).

The following national biodiversity policies are relevant to the Proposed Development:

- National Biodiversity Action Plan 2017-2021 (Department of Culture Heritage and the Gaeltacht, 2017)

### Local Authority Plans

A number of policies and objectives within the following plans are relevant to this Proposed Development:

- Kildare County Council (2017a) Kildare County Development Plan 2017-2023
- Kildare County Council (2007) County Kildare Biodiversity Action Plan 2009-2014
- Kildare County Council (2017b) Leixlip Local Area Plan 2017-2023

<sup>9</sup> The Natura 2000 network is a European network of important ecological sites, as defined under Article 3 of the Habitats Directive 92/43/EEC, which comprises both special areas of conservation and special protection areas. Special conservation areas are sites hosting the natural habitat types listed in Annex I, and habitats of the species listed in Annex II, of the Habitats Directive, and are established under the Habitats Directive itself. Special protection areas are established under Article 4 of the Birds Directive 2009/147/EC for the protection of endangered species of wild birds. The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats.

In Ireland these sites are designed as *European sites* - defined under the Planning Acts and/or the Birds and Habitats Regulations as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

### 6.1.1.2 Scope of Assessment

The study area is defined by the zone of influence of the proposed development with respect to the ecological receptors that could potentially be affected.

The Zone of Influence (ZoI), or distance over which potentially significant effects may occur, will differ across the Key Ecological Receptors (KERs), depending on the potential impact pathway(s). The results of both the desk study and the suite of ecological field surveys undertaken has established the habitats and species present within, and in the vicinity of, the proposed development site. The ZoI and study area was then informed and defined by the sensitivities of each of the KERs present, in conjunction with the nature and potential impacts associated with the the proposed development.

The ZoI of habitat loss impacts will be confined to the area within the the proposed development boundary. The ZoI of potential impacts on surface water quality in the receiving environment could potentially extend downstream as far as Dublin Bay.

The ZoI of general construction and operational activities (i.e. risk of spreading/introducing non-native invasive species, dust deposition and disturbance due to increased noise, vibration, human presence and lighting) is considered unlikely to extend more than several hundred metres from the site of the proposed development.

### 6.1.1.3 Desk Study

A desk study was undertaken on the 5<sup>th</sup> July 2022, to collate available information on the local ecological environment. The following resources were used to inform the assessment presented in this report:

- Data on European sites, Natural Heritage Areas (NHAs) or proposed Natural Heritage Areas (pNHAs) as held by the National Parks and Wildlife Service (NPWS) from <https://www.npws.ie/protected-sites> and <https://www.npws.ie/maps-and-data> – refer to Figure 6.9 and Figure 6.10 for locations of protected sites in the vicinity of the proposed development<sup>10</sup>;
- Records of rare and protected species for the 2 km grid square(s), as held by the National Biodiversity Data Centre [www.biodiversityireland.ie](http://www.biodiversityireland.ie);
- Ordnance Survey Ireland mapping and aerial photography from <http://map.geohive.ie/>;
- Data on waterbodies, available for download from the Environmental Protection Agency (EPA) web map service. Available from <https://gis.epa.ie/EPAMaps/>;
- Information on soils, geology, and hydrogeology in the area available from the Geological Survey Ireland (GSI) online Spatial Resources service. Available from <https://www.gsi.ie/en-ie/data-and-maps/Pages/Groundwater.aspx>;
- Information on the conservation status of birds in Ireland from Birds of Conservation Concern in Ireland (Gilbert et al., 2021);
- Information on the location, nature and design of the proposed development supplied by the applicant's design team; and
- Information contained within a Natura Impact Statement (NIS) for this proposed development (Scott Cawley Ltd, 2022).
- Information on the methods and procedures to be followed in constructing the proposed development from the Outline CEMP prepared for the proposed development by EIS.
- Information on the timber cutting requirements during construction provided in a technical note prepared by Mott MacDonald (Appendix 6.1)
- Information on hydrogeology presented in Chapter 7 (*Land, Soils, Geology & Hydrogeology*) of this EIAR
- Information on hydrology presented in Chapter 8 (*Water & Hydrology*) of this EIAR
- Arborist Report prepared by Independent Tree Services Ltd. (Appendix 6.2)

<sup>10</sup> The following SAC and SPA GIS boundary datasets are the most recently available at the time of writing: SAC\_ITM\_2022\_06 and SPA\_ITM\_2021\_10. Dates for PNHA and NHA datasets should be included also NHA\_ITM-2019\_06 and pNHA\_ITM\_2015\_11

#### 6.1.1.4 Field Surveys

Field surveys carried out to inform this ecological baseline report were carried out within Intel's ownership boundary, and adjacent publicly accessible lands, between May 2021 and March 2022. An additional site survey was undertaken at the T4 and T5 location by Scott Cawley in September 2022 to address a query regarding this proposed tower location. The specific dates of the various survey elements are listed in Table 6.1 overleaf. The overall survey area is shown in Figure 6.2 below.

Information gathered from these surveys of the wider Intel lands were considered in this assessment with focus on the areas directly affected by the proposed development.



**Figure 6.2 Overall survey area**

**Table 6.1 Ecological survey information**

| Survey                                                   | Survey Date(s)                                                                                                                                                                                                                                                | Surveyor(s)                                                                                                                                                                                                   |
|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Habitat and Flora surveys:<br>General habitats and flora | 28 <sup>th</sup> May, 1 <sup>st</sup> June, 4 <sup>th</sup> June, 10 <sup>th</sup> June, 11 <sup>th</sup> June, 24 <sup>th</sup> June, and 22 <sup>nd</sup> -24 <sup>th</sup> September 2021<br>Additional Survey at T4 and T5 location on 1st September 2022 | General habitats and flora, and bryophyte surveys carried out by Scott Cawley Ltd.<br>Annex I petrifying springs [7220] surveys carried out by independent botanical specialists Joanne Denyer and Rory Hodd. |
| Annex I petrifying springs [7220] habitat                | August-December 2021                                                                                                                                                                                                                                          |                                                                                                                                                                                                               |
| Bryophyte surveys                                        | 28 <sup>th</sup> May, 1 <sup>st</sup> June, 4 <sup>th</sup> June, 10 <sup>th</sup> June, 11 <sup>th</sup> June, 24 <sup>th</sup> June, and September 2021                                                                                                     |                                                                                                                                                                                                               |
| Breeding birds                                           | 27 <sup>th</sup> May, 3 <sup>rd</sup> June, and 21 <sup>st</sup> June 2021                                                                                                                                                                                    | Scott Cawley Ltd.                                                                                                                                                                                             |
| Wintering birds                                          | 20 <sup>th</sup> October, 23 <sup>rd</sup> November, 14 <sup>th</sup> December, 15 <sup>th</sup> December 2021, and 13 <sup>th</sup> January, 15 <sup>th</sup> February, 14 <sup>th</sup> March 2022                                                          | Scott Cawley Ltd.                                                                                                                                                                                             |
| Bat surveys:<br>Tree inspections                         | 21 <sup>st</sup> July, 22 <sup>nd</sup> July, 10 <sup>th</sup> August, and 20 <sup>th</sup> October 2021                                                                                                                                                      | Scott Cawley Ltd.                                                                                                                                                                                             |
| Static detector activity surveys                         | <u>Static 1:</u> 10 <sup>th</sup> August – 18 <sup>th</sup> August 2021<br><u>Static 2:</u> 10 <sup>th</sup> August – 18 <sup>th</sup> August 2021<br><u>Static 3:</u> 23 <sup>rd</sup> July – 10 <sup>th</sup> August 2021                                   |                                                                                                                                                                                                               |
| Walked transect surveys                                  | 22 <sup>nd</sup> June, 10 <sup>th</sup> August, 12 <sup>th</sup> August and 9 <sup>th</sup> September 2021                                                                                                                                                    |                                                                                                                                                                                                               |
| Mammals                                                  | 21 <sup>st</sup> July, 22 <sup>nd</sup> July, 10 <sup>th</sup> August, and 20 <sup>th</sup> October 2021                                                                                                                                                      | Scott Cawley Ltd.                                                                                                                                                                                             |
| Molluscs                                                 | 17 <sup>th</sup> August, 18 <sup>th</sup> August, 22 <sup>nd</sup> August, 23 <sup>rd</sup> August, and 15 <sup>th</sup> September 2021                                                                                                                       | Survey of the public lands at Louisa Bridge carried out by Evelyn Moorkens.<br>Surveys of lands within Intel's ownership boundary carried out by Scott Cawley Ltd.                                            |

#### 6.1.1.5 Habitats and Flora Surveys

##### General Habitats and Flora (including Bryophytes)

Habitat and bryophyte surveys were carried out concurrently on the 28<sup>th</sup> May, 1<sup>st</sup> June, 4<sup>th</sup> June, 10<sup>th</sup> June, 11<sup>th</sup> June, 24<sup>th</sup> June, and 22<sup>nd</sup>-24<sup>th</sup> September 2021 by Alexis Fitzgerald of Scott Cawley Ltd., following the methodology described in *Best Practice Guidance for Habitat Survey and Mapping*<sup>7</sup>. The study area covered the lands within Intel's ownership boundary and adjacent public lands, as mapped in Figure 6.1. All habitat types were classified using the *Guide to Habitats in Ireland*<sup>8</sup>, recording the indicator species and abundance using the DAFOR scale<sup>11</sup> and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of *The National Vegetation Database*<sup>9</sup>, having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles*<sup>10</sup> and the British Bryological

<sup>11</sup> The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant, Abundant, Frequent, Occasional and Rare.

Society's *Mosses and Liverworts of Britain and Ireland: A Field Guide*<sup>11</sup>. Annex I habitat types were classified after the *Interpretation manual of European Union Habitats EUR28*<sup>12</sup> with reference to the corresponding national habitat survey reports and NPWS wildlife manuals, as applicable. The nomenclature for Annex I habitats follows that of the *Interpretation manual of European Union Habitats EUR28* with abbreviated names after those used in *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview*<sup>13</sup>. An updated site walkover of the seven proposed tower locations (as shown in Figure 6.1) was carried out by Shea O'Driscoll of Scott Cawley in June 2022.

#### Annex I Petrifying Springs with Tufa Formation (Cratoneurion) [7220] Survey

##### *Overview*

Annex I petrifying springs with tufa formation (*Cratoneurion*) [\*7220] surveys were undertaken by Dr. Joanne Denyer of Denyer Ecology Ltd, and Dr. Rory Hodd, independent bryologist and ecologist. This Annex I priority habitat is hereafter referred to as 'petrifying springs'. The aim of this survey was to identify all locations of tufa deposits and petrifying springs habitat within Intel's ownership boundary. The survey area included both banks of the Rye Water, the Kellystown stream, the Hamwood stream, and Louisa Bridge. Where a watercourse with tufa formation was located, the full length of the tufa forming section of the watercourse was surveyed. The field surveys commenced in August 2021 and were completed in December 2021. The initial surveys of the features were carried out in August, and the riverbanks were revisited between November and December. This gives the advantage of both undertaking surveys in summer, when more species are present; and visiting sites in winter, when water levels are higher and springs with low summer flows are more visible. This ensures that the surveys provide the best scientific data, which is the most up to date, to inform assessment of the springs.

##### *Site walkover*

All accessible areas of the study area were walked over by two surveyors. The location of any base-rich seepages/springs/tufa formation was mapped using a GPS. General notes of the vegetation (vascular plants and bryophytes) of any areas of base-rich seepages/springs/tufa formation were made and representative photographs taken.

##### *Detailed survey*

Detailed survey was undertaken of each base-rich seepage/spring/tufa formation<sup>12</sup> to determine a) if it is an example of the Annex I priority habitat \*7220; b) to evaluate its quality and condition; and, c) assign a conservation score and ranking. The detailed survey was undertaken in a representative or 'typical' section of each base-rich spring/stream/seepage. Where stream flowed into the Rye Water, the detailed plot was usually undertaken upstream from where the watercourses join (sometimes outside of the SAC). This is because the point at which the tufa forming streams join the river are atypical of the length of the stream. There may be 1-2 m of cascade tufa (e.g. Table 3.1, L01) with little vegetation due to the high flow and varying river height. Data collected included habitat and plot photographs; plot location(s) (GPS); recording of percentage cover of all vascular plant and bryophyte species (including positive and negative indicator species); shading; tufa type and extent; and, impacting activities (such as grazing, invasive species, changes to water quality and/or quality, trampling and dumping). The plot sampling methodology follows Lyons, M.D. & Kelly, D.L. (2016). Monitoring guidelines for the assessment of petrifying springs in Ireland. *Irish Wildlife Manuals*, No. 94. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Ireland. Petrifying spring/ stream vegetation communities were classified using Lyons, M.D. & Kelly, D.L. (2017). Plant community ecology of petrifying springs (*Cratoneurion*) – a priority habitat. *Phytocoenologia* 47 (1): 13-32.

##### *Condition assessment*

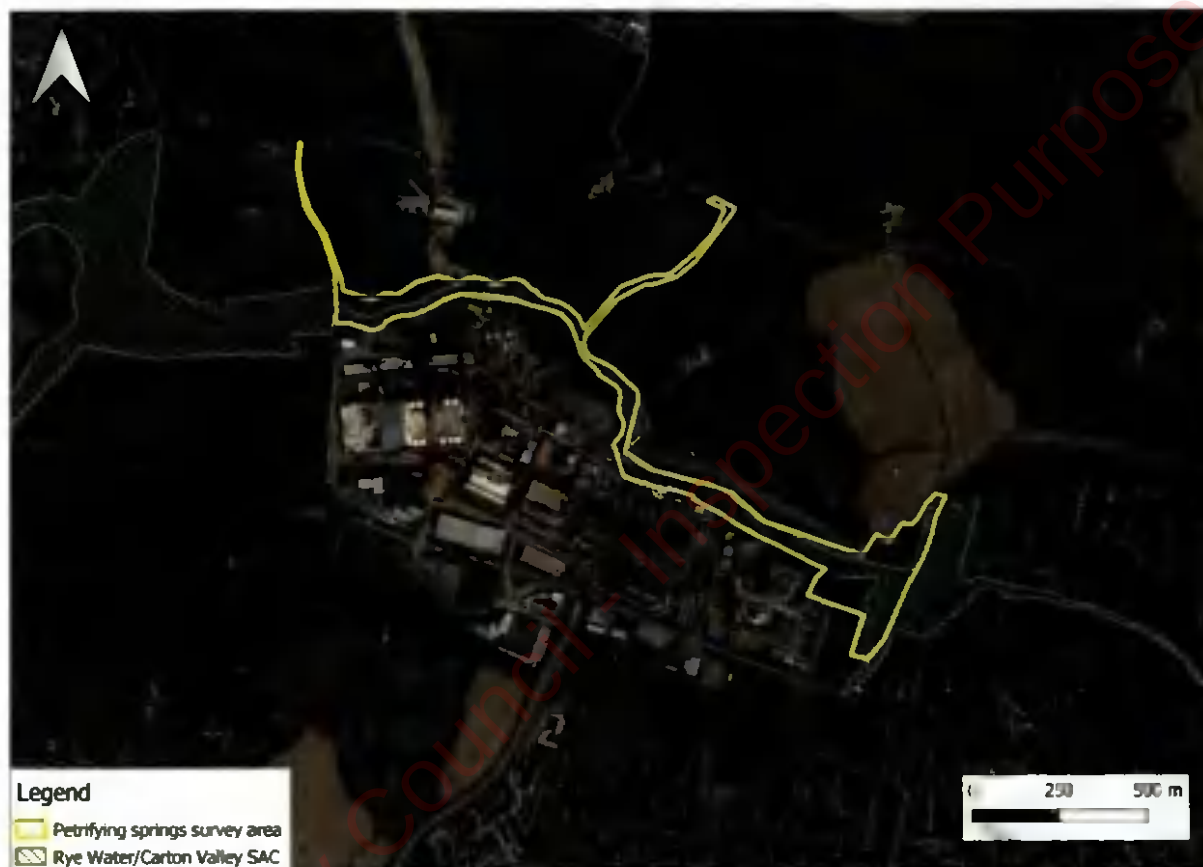
The ecological condition of the springs was assessed using the 'Monitoring Guidelines for the Assessment of Petrifying Springs in Ireland' (Lyons & Kelly, 2016). Criteria include positive and negative indicator species (frequency and cover), woody species cover, vegetation height and disturbance.

##### *Conservation score*

<sup>12</sup> The terms base-rich/ tufa-forming/ stream/ spring/ seepage are used when referring in general to tufa forming habitats within the survey area.

The 'Conservation Score' of the petrifying springs was assessed using the 'Monitoring Guidelines for the Assessment of Petrifying Springs in Ireland' (Lyons & Kelly, 2016). Criteria such as species diversity, High Quality indicator species, tufa-forming capacity and other positive characteristics are used to calculate the 'Conservation Score' for each spring. This score is then used to rank the quality of the spring at a national level (Lyons & Kelly, 2016)

Where there was flowing water, the pH and conductivity of the spring water from each plot was measured using a handheld pH meter to determine baseline chemical condition. Detailed water chemistry data was available for one watercourse (L12). Parameters recorded include pH, Alkalinity CaCO<sub>3</sub>, Calcium Dissolved, Conductivity, Dissolved Hardness as CaCO<sub>3</sub>, Nitrate, Orthophosphate, Total Dissolved Solids and Total Ammonia.



**Figure 6.3 Petrifying Spring [\*7220] Survey Area**

#### 6.1.1.6 Fauna Surveys

##### Breeding Birds

Breeding bird surveys were undertaken on the 27<sup>th</sup> May, 3<sup>rd</sup> June, and 21<sup>st</sup> June 2021 by Laura Higgins, Maeve Maher McWilliams, Lorna Gill and Shea O'Driscoll, all of Scott Cawley Ltd., using a methodology adapted from the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*<sup>14</sup>. The study area covered the lands within Intel's ownership boundary and adjacent public lands, as mapped in Figure 6.4. All habitat features suitable to support breeding birds were surveyed, with a particular focus on areas of woodland. The methodology included a combination of transects and point counts, as appropriate for each habitat type. Birds were identified by sight and song, and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.



**Figure 6.4 Breeding Bird Survey Area**

#### Wintering Birds

Wintering bird surveys were undertaken on the 20<sup>th</sup> October, 23<sup>rd</sup> November, 14<sup>th</sup> December, 15<sup>th</sup> December 2021, and 13<sup>th</sup> January, 15<sup>th</sup> February, 14<sup>th</sup> March 2022 by Cathal O'Brien, Shane Brien and Eoin Cussen of Scott Cawley Ltd. using a methodology based on the *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*<sup>14</sup>. The study area covered the lands within Intel's ownership boundary and adjacent public lands, as mapped in Figure 6.5. Lands were initially surveyed visually using binoculars/scope from a vantage point(s) at the edge of the study area followed by a walkover of the area to identify birds which may not be visible from a distance (e.g. waders) and evidence of usage by wildfowl such as swans or geese (e.g. droppings). Birds were identified by sight and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.



**Figure 6.5 Winter bird survey area**

#### Mammals (excluding bats)

A terrestrial fauna survey (excluding bats) was undertaken on the 21<sup>st</sup> July, 22<sup>nd</sup> July, 10<sup>th</sup> August, and 20<sup>th</sup> October 2021 by Laura Higgins, Tim Ryle, Shea O'Driscoll, Shane Brien and Síofra Quigley, all of Scott Cawley Ltd. The study area covered the lands within Intel's ownership boundary and adjacent public lands, as mapped in Figure 6.1. The presence/absence of terrestrial fauna species were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats on site were assessed for signs of usage by protected/red-listed fauna species, and their potential to support these species.

#### Molluscs

Mollusc surveys were undertaken on 17<sup>th</sup> August, 18<sup>th</sup> August, 22<sup>nd</sup> August, 23<sup>rd</sup> August, and 15<sup>th</sup> September 2021 by Evelyn Moorkens and Ian Killeen of Evelyn Moorkens & Associates, and Shane Brien, Emmi Virkki and Colm Clarke of Scott Cawley Ltd. Targeted mollusc surveys of the following species of interest were carried out: *Vertigo moulinsiana*, *Vertigo angustior* and *Succinella oblonga*. At each of the mollusc sampling locations, all species of mollusc present were recorded and are included in this baseline ecological report. Details of the survey methodologies for each of the target mollusc species are detailed below.

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**Figure 6.6 Mollusc survey area**

#### *Vertigo* surveys

Surveys were undertaken at Louisa Bridge for the Annex II whorl snail species for which the Rye Water Valley/Carton SAC are designated- *Vertigo moulinsiana* and *Vertigo angustior*. Surveys for these species were carried out most recently in 2008 (Moorkens & Killeen, 2011) and in 2014 (Brophy & Long, 2019a, b). The same methodology has been used in the 2021 surveys as that devised in 2008, to allow for a comparison over time to be made, as detailed below.

Habitat suitability surveys for *Vertigo* species were carried out along wetland features within the study area, including the Hamwood Stream, Kellystown Lane, and the north and south banks of the Rye Water from Sandford's Bridge to Louisa Bridge. The vegetation along the river's edge was either completely dry underfoot or entirely under water with evidence of fluctuating water levels (scour marks and flood debris higher the water levels at the time of the survey) and therefore, did not have the degree of wetness and stable hydrogeological/hydrological conditions necessary to support either *Vertigo angustior* or *Vertigo moulinsiana*. Detailed *Vertigo* condition assessments were therefore not carried out at these locations.

#### *Desmoulin's whorl snail Vertigo moulinsiana* surveys at Louisa Bridge

At the Louisa Bridge survey areas for *Vertigo moulinsiana*, samples were taken from 10 areas of mostly suitable habitat to provide adequate information for Condition Assessment. Definitions for condition assessment are shown in Table 6.2. Locations are given in Figure 6.7 and in Table 6.3. Samples were taken by bashing long vegetation over a white tray and examining the contents in the field. Five bashes were made at each site.

The condition assessment follows the protocols for population and habitat given in Table 6.4 and Table 6.5.

**Table 6.2 Specific Habitat Definitions for *Vertigo moulinsiana* at Louisa Bridge**

| <b>Vegetation Classes</b><br>(For condition assessment, the plant species are classified into 4 groups): Class 1 being the most favoured plants at the site to Class 4 which are unsuitable | <b>Class I</b>                                                                                                                                                                                                                                                                                                                               | <b>Class II</b>                                                                         | <b>Class III</b>                                                                                                                          | <b>Class IV</b>   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
|                                                                                                                                                                                             | tall <i>Carex</i> species<br><i>Sparganium erectum</i><br><i>Glyceria maxima</i>                                                                                                                                                                                                                                                             | <i>Phragmites australis</i><br><i>Equisetum fluviatile</i><br><i>Typha angustifolia</i> | <i>Epilobium hirsutum</i><br><i>Mentha aquatica</i><br><i>Juncus</i> spp.<br><i>Deschampsia cespitosa</i><br><i>Eupatorium cannabinum</i> | All other species |
| <b>Soil Moisture classes</b><br>(Ground moisture levels recorded on a scale of 1-5 at each replicate sampling point): classes 3 and 4 are usually the most favourable                       | Dry. No visible moisture on ground surface<br>Damp. Ground visibly damp, but water does not rise under pressure<br>Wet. Water rises under light pressure<br>Very wet. Pools of standing water, generally less than 5cm deep<br>Site under water. Entire sampling site in standing or flowing water over 5cm deep.                            |                                                                                         |                                                                                                                                           |                   |
| <b>Definition of Optimal habitat</b>                                                                                                                                                        | Where <i>Vertigo moulinsiana</i> could survive in a large area (average 50%) of the habitat. It includes a good distribution of tall <i>Carex</i> species, sometimes interspersed with <i>Schoenus nigricans</i> and <i>Phragmites australis</i> . It is wet enough for water to rise and surround the surveyor's boot under light pressure. |                                                                                         |                                                                                                                                           |                   |
| <b>Definition of Sub-optimal habitat</b>                                                                                                                                                    | Where there are patches of vegetation and conditions that support <i>Vertigo moulinsiana</i> (average 10% of habitat), but the majority of the habitat cannot.                                                                                                                                                                               |                                                                                         |                                                                                                                                           |                   |

**Table 6.3 Locations of sampling sites for *Vertigo moulinsiana* at Louisa Bridge**

| Sample Area | Grid Reference | Description                                                                            |
|-------------|----------------|----------------------------------------------------------------------------------------|
| 1           | N 9947 3671    | Pools with <i>Typha</i> and tall sedges                                                |
| 2           | N9947 3673     | Damp hollow on west side of track with grasses, <i>Pulicaria</i> and <i>Eupatorium</i> |
| 3           | N9948 3678     | Wet seepage with grasses, <i>Equisetum</i> , <i>Carex</i> etc                          |
| 4           | N9950 3677     | Wet seepage with grasses, <i>Equisetum</i> , <i>Carex</i> etc                          |
| 5           | N9949 3679     | Wet seepage with grasses, <i>Typha</i> , <i>Mentha</i> etc                             |
| 6           | N9951 3680     | Damp grassland with <i>Iris</i> , <i>Carex</i> and <i>Eupatorium</i>                   |
| 7           | N9952 3680     | Wet seepage with grasses, <i>Equisetum</i> , <i>Carex</i> , <i>Mentha</i> etc          |
| 8           | N9952 3683     | Valley floor fen with <i>Phragmites</i> , <i>Sparganium</i> and <i>Iris</i>            |
| 9           | N9948 3685     | Valley floor fen with <i>Phragmites</i> , <i>Glyceria</i> and <i>Iris</i>              |
| 10          | N9948 3686     | Valley floor fen with <i>Phragmites</i> , <i>Glyceria</i> and <i>Iris</i>              |

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**Table 6.4 Population Condition Assessment Protocol for *Vertigo moulinsiana* at Louisa Bridge**

| Indicator                        | Target                                                                                                               |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------|
| Presence/absence<br>(Site level) | <i>V. moulinsiana</i> is present in 5 of the 10 sample areas                                                         |
| Presence/absence<br>(Site level) | <i>V. moulinsiana</i> is present in 50% of the samples where the habitat is optimal (based upon at least 20 samples) |
| Abundance<br>(Site level)        | 5 samples contain at least 10 adult and juvenile snails (based upon at least 20 samples)                             |

3 passes Favourable (green); 2 passes Unfavourable Inadequate (amber); 0-1 passes Unfavourable Bad (red)

**Table 6.5 Habitat Condition Assessment Protocol for *Vertigo moulinsiana* at Louisa Bridge**

| Indicator                       | Target                                                                         | Result                  | Pass/Fail |
|---------------------------------|--------------------------------------------------------------------------------|-------------------------|-----------|
| Habitat Extent<br>(Site level)  | 5 of the 10 sample areas are dominated by suitable vegetation (Classes I & II) | 6 sample areas suitable | Pass      |
| Habitat Quality<br>(Site level) | 5 of the 10 sample areas fall within soil moisture classes 3-5                 | 8 sample areas suitable | Pass      |
| Habitat Extent<br>(Site level)  | >0.2 ha of the site comprising a mosaic of Optimal and sub-optimal habitat     | 0.204ha                 | Pass      |

3 passes green; 2 passes amber; 0-1 passes red


**Figure 6.7 Vertigo sampling areas at Louisa Bridge**

### Narrow mouthed whorl snail- *Vertigo angustior* surveys at Louisa Bridge

At the Louisa Bridge survey areas for *Vertigo angustior* samples were taken from the most suitable areas for the species within the optimal (or sub-optimal) habitat, designed entirely to determine the present extent of *Vertigo angustior*. No sampling was carried out elsewhere on the site as the habitat there had already been identified as unsuitable in previous surveys. The locations are given in Table 6.6

**Table 6.6 Locations of sampling sites for *Vertigo angustior* at Louisa Bridge**

| Site No. | Grid Reference | Description                                                                             |
|----------|----------------|-----------------------------------------------------------------------------------------|
| 1        | N9943 3687     | <i>Iris</i> marsh relatively high on slope at western end of site – sub-optimal habitat |
| 2        | N9944 3686     | <i>Iris</i> marsh at break of slope – sub-optimal habitat                               |
| 3        | N9946 3684     | <i>Iris</i> marsh at break of slope – sub-optimal habitat                               |
| 4        | N9951 3682     | <i>Iris</i> marsh relatively high on slope at eastern end of site – sub-optimal habitat |
| 5        | N9954 3683     | <i>Iris</i> marsh relatively high on slope at eastern end of site – sub-optimal habitat |

**Table 6.7 Specific Habitat Definitions for *Vertigo angustior* at Louisa Bridge**

|                                          |                                                                                                                                                                                                  |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Definition of Optimal habitat</b>     | Wet grassland dominated by <i>Iris pseudacorus</i> , low herbs and mosses up to 0.9m high. Habitat growing on damp, friable soil covered with a layer of humid, open structured moss and litter. |
| <b>Definition of Sub-optimal habitat</b> | The <i>Iris</i> grassland is >0.9m high, or the water table is below 5cm or ground is flooded at the time of sampling.                                                                           |

**Table 6.8 Population Condition Assessment Protocol for *Vertigo angustior* at Louisa Bridge**

| Indicator                        | Target                                          |
|----------------------------------|-------------------------------------------------|
| Presence/absence<br>(Site level) | <i>Vertigo angustior</i> is present at the site |

1 pass Favourable (green); 0 passes Unfavourable Bad (red)

**Table 6.9 Habitat Condition Assessment Protocol for *Vertigo angustior* at Louisa Bridge**

| Indicator                               | Target                                                                                         |
|-----------------------------------------|------------------------------------------------------------------------------------------------|
| Habitat extent:<br>(sample site level)  | The habitat at all 5 sample sites is classed as Optimal or sub-optimal                         |
| Habitat quality:<br>(sample site level) | Soils, at time of sampling, at all 5 sample sites are damp (optimal wetness)                   |
| Habitat extent:<br>(Overall Site level) | At least 0.2 ha of the site should support habitat which is classed as optimal and sub-optimal |

passes green; 2 passes amber; 0-1 passes red

### Other mollusc surveys

The southern and northern banks of the Rye Water between Sandford's Bridge in the west and Louisa Bridge in the east were surveyed to identify potentially suitable habitat for *Succinella oblonga* and *Myxas glutinosa*, and to record other mollusc species present in the area. *Succinella oblonga* is classed as an endangered species by the IUCN, and is declining across Ireland<sup>15</sup>. It is associated with open, wet muds that are exposed to sun but remain damp year-round<sup>16</sup>. Deer are common in the Rye Water Valley, and particular attention was paid to the identification of deer tracks, where suitable habitat may arise for *Succinella oblonga*, particularly near the edge of the Rye Water River. The 2013 *Succinella oblonga* translocation site and a second potentially suitable area of open wet grassland/recolonising bare ground habitat nearby was surveyed. These sites are located immediately south-east of a pond at Intel. An area of land immediately east of the two sample locations that was identified as suitable for *Succinella oblonga* by Evelyn Moorkens and Associates in 2018<sup>17</sup> was also surveyed. A species *Myxas glutinosa* is classified as an endangered species by the IUCN, and Irish

populations are declining and fragmenting. It is a species of 'clean, unpolluted and usually hard water' on hard surfaces or plants<sup>18</sup>, and is considered common within the Royal and Grand Canals<sup>19</sup>. The study area was surveyed for areas of suitable habitat for this species.

At each sampling location samples were taken by bashing long vegetation over a white tray and examining the contents in the field; fresh and decaying vegetation were taken off site and dried to search for contents which were analysed in the lab. Five bashes were made at each sampling area.

## **Bats**

### *Building and tree inspections*

Tree inspection surveys were carried out on 21<sup>st</sup> July, 22<sup>nd</sup> July, 10<sup>th</sup> August, and 20<sup>th</sup> October 2021 by Laura Higgins, Tim Ryle, Shea O'Driscoll, Shane Brien and Siofra Quigley, all of Scott Cawley Ltd. Trees within the study area were inspected from ground level to determine their suitability for roosting bats. They were assessed based on the presence of features commonly used by bats. Examples of such features include:

- Natural holes;
- Woodpecker holes;
- Cracks/splits in major limbs;
- Loose bark; and,
- Hollows/cavities

There are no buildings or dwellings with bat suitability within or adjacent to the proposed development site. Additionally, no buildings will be directly affected by the proposed development. Therefore, building roosts for bats are not relevant to this assessment.

The inspections of trees within the study area involved a search for evidence of bats such as:

- Dead specimens;
- Bat droppings;
- Urine splashes;
- Fur-oil staining;
- Squeaking noises; and
- Feeding remains (moth wings)

The assessment criteria outlined in Table 6.10 below are derived from Collins (2016)<sup>20</sup>, and are used for the assessment of the site in terms of its suitability for commuting and foraging bats, and where relevant, the suitability of roosting habitats for bats.

**Table 6.10 Assessment Criteria for potential suitability of proposed development sites for bats, derived from similar criteria in Bat Surveys for Professional Ecologists: Good Practice Guidelines**

| Suitability | Description of Roosting Habitat                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Commuting and foraging habitats                                                                                                                                                                                                                                                                                                                                                               |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Negligible  | Negligible habitat features on site likely to be used by roosting bats.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Negligible habitat features on site likely to be used by commuting or foraging bats.                                                                                                                                                                                                                                                                                                          |
| Low         | A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions <sup>13</sup> and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).<br>A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential. | Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.                           |
| Moderate    | A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed)                                                                                                                                                   | Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.<br>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.                                                                                                   |
| High        | A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats in a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.                                                                                                                                                                                                                                                                                 | Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub, hedgerows. Linked back gardens, river valleys, streams and woodland edge.<br>Habitat that is connected to the wider landscape that could be used by foraging bats such as trees scrub, grassland or water.<br>Site is close to and connected to a known roost. |

#### Walked transect surveys

Three no. bat activity surveys were carried out on 22nd June, 10<sup>th</sup> August and 12<sup>th</sup> August (single survey split over two nights), and 9<sup>th</sup> September 2021, by Shea O'Driscoll, Síofra Quigley, Lorna Gill, Zuzana Erosova and Róisín O'Connell. Walked transects covering the wider study area were carried out by surveyors on each of these nights (see Figure 6.8 below). The study area covered the entire subject lands focusing on bat activity along treelines, hedgerows and woodland. Surveying commenced at sunset and continued until the survey was complete, approximately two to three hours after sunset. Bat activity was recorded using Elekon BatLogger M and Elekon BatLogger M2 detectors which record the location of bat calls and have an internal GPS unit to record/plot the transect route. Detectors were set to record continuously, saving call files in WAV format. Bat calls recorded were manually analysed using BatExplorer software. Weather conditions were considered to be suitable for all transect surveys.

<sup>13</sup> For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

**Table 6.11 Bat transect survey details**

| Transect no. | Date                       | Sunset Time | Start time | Finish time |
|--------------|----------------------------|-------------|------------|-------------|
| 1            | 22.07.2021                 | 21:36       | 21:40      | 00:30       |
| 2            | 10.08.2021 &<br>12/08/2021 | 21:03       | 21:04      | 00:00       |
| 3            | 09.09.2021                 | 20:00       | 20:00      | 22:30       |

**Static detector activity surveys**

Three no. static bat detectors were deployed in areas of woodland within the study area, to record bat activity in areas that could not be adequately covered by walked transect surveys (see Figure 6.8 below). The static detectors used were SM4 bat detectors (Wildlife Acoustics). Detectors were set to record in WAC format from sunset to sunrise set to automatically trigger in response to potential bat calls. Bat calls were analysed using the Kaleidoscope auto-identification software (Wildlife Acoustics). Static 1 and 2 were deployed between 10<sup>th</sup> August and 18<sup>th</sup> August 2021, Static 3 was deployed between 23<sup>rd</sup> July and 10<sup>th</sup> August 2021.

**Figure 6.8 Bat transects and static bat detector locations within the study area****Limitations**

The initial bat transect survey on 22<sup>nd</sup> June was not completed in full due to weather conditions and access issues encountered by surveyors on the night. However, this is not considered to pose any limitation to the identification of habitats of importance for bats, and to the overall assessment as approximately 90% of the transect was completed on the first survey, the transect was completed in full on two other occasions and the overall bat survey effort for this baseline report was extensive. The approach with regards to transect design is consistent with Collines (2016), which is considered to be best practice for bat surveys in Ireland and the United Kingdom.

Tree inspections for potential roosting features (PRFs) were carried out during the summer months. This is outside the optimal survey period for PRFs as foliage can obscure PRFs. Given the large areas of woodland, treelines and hedgerows within the wider survey area, and the fact that these surveys were carried out concurrently with the mammal surveys, there are likely to be more trees with PRFs present than recorded

during these surveys. This is considered to be a limitation of this report, however, as pre vegetation trimming surveys have been included within this report as mitigation measures (sections 6.5.2.3 and 6.5.2.4), this will not impact on the assessment of the proposed development.

Mammal surveys were carried out during the summer months. This is outside the optimal survey period for mammals as foliage can obscure signs of mammals. This is not considered to pose a significant limitation on this assessment as surveys for mammals were carried out systematically throughout the lands and Scott Cawley are actively carrying out monitoring of known badger setts in close proximity to the proposed development site. This monitoring has been considered within this assessment.

### 6.1.1.7 Ecological Evaluation and Impact Assessment

#### Ecological Evaluation

Ecological receptors (including identified sites of ecological importance) are valued with regard to the ecological valuation examples set out in *Guidelines for Assessment of Ecological Impacts of National Roads Schemes: Revision 2* (NRA, 2009) and the guidance provided in *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018) – refer to Appendix 6.3 for examples of how ecological importance is assigned. In accordance with these guidelines, important ecological features within what is referred to as the Zone of Influence (ZoI) of the proposed development which are “both of sufficient value to be material in decision making and likely to be affected significantly” are deemed to be ‘Key Ecological Receptors’ (KERs). These are the ecological receptors which may be subject to significant effects from the proposed development, either directly or indirectly. KERs are those biodiversity receptors with an ecological value of local importance (higher value) or greater.

#### Impact Assessment

Ecological impact assessment is conducted following a standard source-pathway-receptor model, where, in order for an impact to be established all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism is sufficient to conclude that a potentially significant effect would not occur.

- Source(s) – e.g. pollutant run-off from proposed works
- Pathway(s) – e.g. groundwater connecting to nearby qualifying wetland habitats
- Receptor(s) – e.g. wetland habitats and the fauna and flora species they support

#### Characterising and Describing the Impacts

The parameters considered in characterising and describing the potential impacts of the proposed development are per the EPA's *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports*<sup>21</sup> and CIEEM's (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland*, whether the effect is positive, neutral or negative; the significance of the effects; the extent and context of the effect; the probability, duration and frequency of effects; and, cumulative effects.

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. The following development types are included in considering cumulative effects:

- Existing projects (under construction or operational)
- Projects which have been granted consent but not yet started
- Projects for which consent has been applied for which are awaiting a decision, including those under appeal
- Projects proposed at a plan level, if relevant (e.g. future strategic infrastructure such as roads or greenways)

The likelihood of an impact occurring, and the predicted effects, can also be an important consideration in characterising impacts. In some cases it may not be possible to definitively conclude that an impact will not occur. In these cases the evaluation of significant effects is based on the best available scientific evidence but where reasonable doubt still remains then the precautionary principle is applied and it may need to be assumed that significant effects may occur. Professional judgement is used in considering the contribution of all relevant criteria in determining the overall magnitude of an impact.

### Significant Effects

In determining whether potential impacts will result in significant effects, the CIEEM guidelines (2018) were followed. The approach considers that significant effects will occur when there are impacts on either:

- the structure and function (or integrity) of defined sites, habitats or ecosystems; or
- the conservation status of habitats and species (including extent, abundance and distribution).

#### *Integrity*

The term "integrity" may be regarded as the coherence of ecological structure and function, across the entirety of a site that enables it to sustain all of the biodiversity or ecological resources for which it has been valued (NRA, 2009).

The term 'integrity' is most often used when determining impact significance in relation to designated areas for nature conservation (e.g. SACs, SPAs or pNHA/NHAs) but can also be the most appropriate method to use for non-designated areas of biodiversity value where the component habitats and/or species exist with a defined ecosystem at a given geographic scale.

An impact on the integrity of an ecological site or ecosystem is considered to be significant if it moves the condition of the ecosystem away from a favourable condition: removing or changing the processes that support the sites' habitats and/or species; affect the nature, extent, structure and functioning of component habitats; and/or, affect the population size and viability of component species.

#### *Conservation Status*

Similar definitions for conservation status given in the EU Habitats Directive 92/43/EEC, in relation to habitats and species, are also used in the CIEEM (2018) and NRA (2009) guidance which are summarised as follows:

For natural habitats, conservation status means the sum of the influences acting on the natural habitat and its typical species, that may affect its extent, structure and functions as well as its distribution, or the long-term survival of its typical species, at the appropriate geographical scale

For species, conservation status means the sum of influences acting on the species concerned that may affect the abundance of its populations, as well as its distribution, at the appropriate geographical scale

An impact on the conservation status of a habitat or species is considered to be significant if it will result in a change in conservation status, having regard to the definitions of favourable conservation status provided in the EU Habitats Directive 92/43/EEC – i.e. into the future, the range, area and quality of habitats are likely to be maintained/increased and species populations are likely to be maintained/increased.

According to the CIEEM (2018) methodology, if it is determined that the integrity and/or conservation status of an ecological receptor will be impacted on, then the level of significance of that impact is related to the geographical scale at which the impact will occur (i.e. local, county, national, international). In some cases an impact may not be significant at the geographic scale at which the ecological feature has been valued but may be significant at a lower geographical level. For example, a particular impact may not be considered likely to have a negative effect on the overall conservation status of a species which is considered to be internationally important. However, an impact may occur at a local level on this internationally important species. In this case, the impact on an internationally important species is considered to be significant at only a local, rather than an international level.

## 6.2 THE PROPOSED DEVELOPMENT

### 6.2.1 DEVELOPMENT DESCRIPTION

Intel proposes to realign an approximately 1.1 km long section of the existing Maynooth-Ryebrook 110kV double circuit overhead line (OHL). The proposal is to move a section of this line that spans Rye Water valley and the Intel site eastwards.

The various elements of the proposed development are described in detail in Chapter 4 *Project Description* of the EIA. The design measures included to protect the receiving groundwater environment are described in Chapter 7, *Land, Soils, Geology & Hydrogeology*; those to protect the receiving surface water environment in Chapter 8 *Water & Hydrology*; and those to protect air quality in Chapter 9, *Air Quality and Climate*. The landscaping design is detailed in the Landscape Plan that accompanies the application.

These environmental controls are drawn together in the following subsections to facilitate a clear assessment of the effects on biodiversity.

### 6.2.2 CONSTRUCTION PHASE

The proposed development description is contained within the Outline CEMP accompanying this application. The main characteristics of the Construction Phase of the proposed development that have potential for ecological impact are:

- Site preparation and vegetation clearance;
- Protection and relocation of existing water main and LV cables;
- Ground testing;
- Excavation of existing 4No OHL towers, associated overhead lines, and foundations;
- Installation of new 110kV OHL tower foundations;
- The installation of 7No new double circuit steel lattice towers;
- Stringing of overhead lines;
- Construction traffic within access routes;
- Landscaping and tree planting; and
- Reinstatement of temporary land acquisitions.

### 6.2.3 ACCESS ROUTES

Access routes will be provided/constructed taking into consideration the surface type and ground conditions. Access to each tower location has been assessed and will be monitored for changing conditions depending on the timing of the construction and present ground conditions at that time. Three access methods are proposed based on the ground conditions, involving existing hardstanding, temporary tracks, or constructed roadways where ground surfaces are extremely poor. The construction of roadways will only be considered as a last resort where temporary tracks are not sufficient. Proposed access routes are outlined within the Outline CEMP prepared by EIS for this application.

### 6.2.4 VEGETATION CLEARANCE

Vegetation clearance will be required at T4 and T5 proposed tower locations to enable main construction works to proceed. It is outlined within the Outline CEMP the loss of localised vegetation at the tower sites, including trees, shrub, and hedge removal to allow for the construction of towers, will be reinstated and that any vegetation clearance will be completed outside the nesting season.

All vegetation adjacent to the proposed overhead line, to a maximum of 3m (without surplus) both under the conductors and to within a lateral distance of 10m from outside the conductors, which has the potential to fall onto the conductors, will be cut or trimmed to ensure safety clearances. The extent of vegetation cutting requirements are shown in the technical note prepared by Mott MacDonald (Appendix 6.1) and within the Tree Impact/Protection Plan drawing prepared by Independent Tree Services. Timber cutting will form part of the ongoing maintenance of the proposed OHL. As outlined within the Tree Impact/Protection Plan drawing (Appendix 6.4), no vegetation clearance is proposed within the Rye Water Valley/ Carton SAC.

### 6.2.5 OPERATIONAL PHASE

With the exception of the timber cutting required as part of regular maintenance of the proposed OHL towers, as described above, no additional significant works are thought to be required as part of the operational phase of the proposed development.

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## 6.3 THE RECEIVING ENVIRONMENT

### 6.3.1 DESIGNATED SITES

#### 6.3.1.1 European Sites

Special Areas of Conservation (SAC) are designated under the EC Habitats Directive (92/43/EEC) for the protection of habitats listed on Annex I and/or species listed on Annex II of the Directive. Special Protection Areas (SPAs) are designated under the Birds Directive (2009/147/EC) for the protection of bird species listed on Annex I of the Directive, regularly occurring populations of migratory species (such as ducks, geese or waders), and areas of international importance for migratory birds.

None of the proposed towers are located within a European site, however the proposed application boundary / proposed overhead line infrastructure crosses through the Rye Water Valley/Carton SAC (see Figure 6.1 above).

There are no other European sites in the immediate vicinity. The next closest European site to the proposed development is Glenasmole Valley SAC; c.15.6 km to the south-east, in the Dublin Mountains and which is not hydrologically connected to the proposed development. The Rye Water is a tributary of the River Liffey and the following European sites in Dublin Bay lie approximately 20 km downstream: North Dublin Bay SAC, South Dublin Bay SAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA.

The SAC and SPA sites in the vicinity of the proposed development, their distance from the proposed development and their Qualifying Interests/Special Conservation Interests are presented in Appendix 6.5. The locations of those SAC and SPA sites relative to the proposed development are illustrated in Figure 6.9

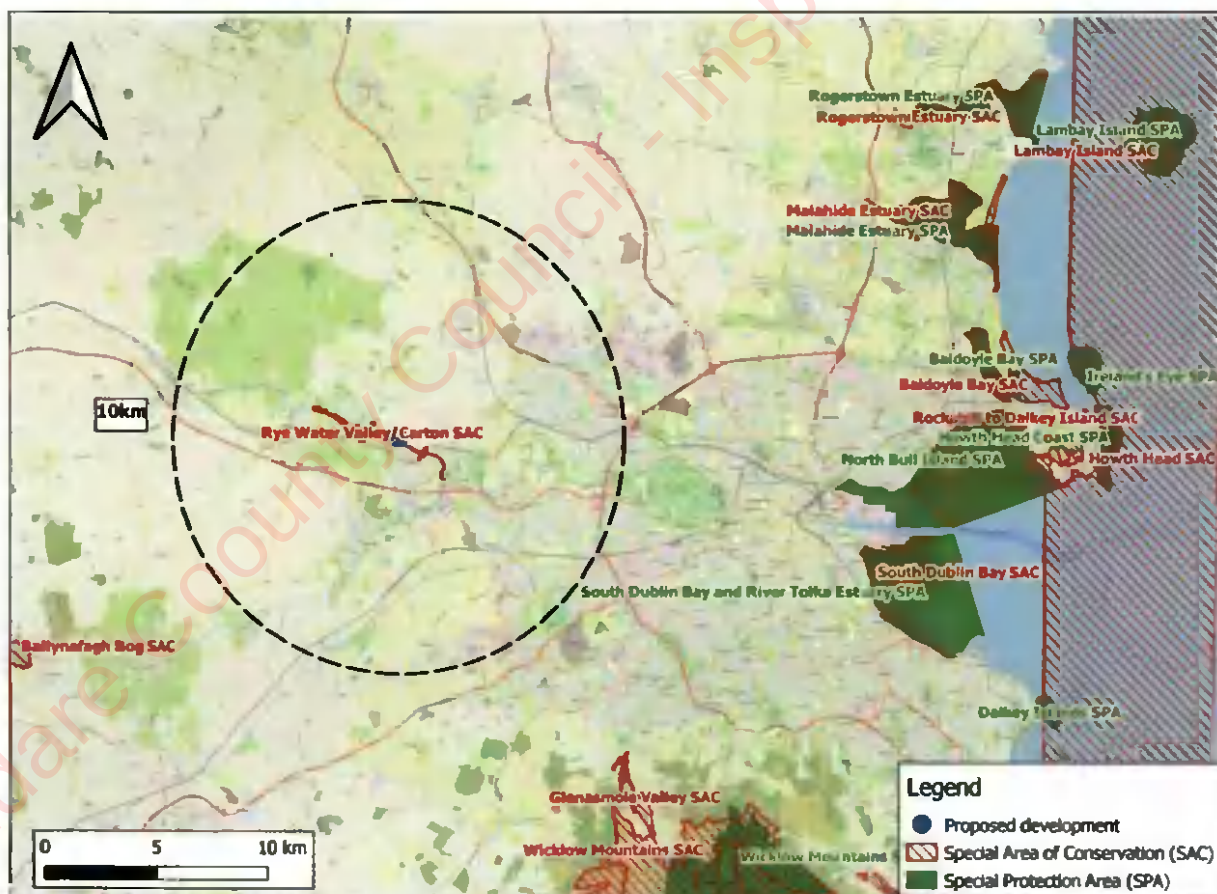


Figure 6.9 European sites in the vicinity of the proposed development

### 6.3.1.2 Nationally Designated Sites

Natural Heritage Areas (NHAs) are designated under the Wildlife Acts to protect habitats, species or geology of national importance. In addition to NHAs there are proposed NHAs (referred to as pNHAs), which are also sites of significance for wildlife and habitats and were published on a non-statutory basis in 1995, but have not since been statutorily proposed or designated. Proposed NHAs are offered protection in the interim period under county or city development plans which requires that planning authorities give due regard to their protection in planning policies and decisions.

The proposed development crosses the boundary of one nationally designated sites, the Rye Water Valley/ Carton pNHA (001398). The proposed development lies in close proximity (c. 44m) from the Royal Canal pNHA (002103). Several additional pNHA sites are located within the vicinity of the proposed development site as shown in Figure 6.10.

Surface waters within the proposed development site ultimately discharge into Dublin Bay coastal waterbody via the Rye Water and the River Liffey. Therefore, the proposed development is hydrologically connected to the following nationally designated sites in the downstream receiving environment: Liffey Valley pNHA (000128), Dolphins, Dublin Docks pNHA (000201), South Dublin Bay pNHA (000210) and North Dublin Bay pNHA (000206). The latter sites located c. 20 km downstream and have been designated for a range of features, including coastal habitats.

The NHA and pNHA sites in the vicinity of the proposed development, their distance from the proposed development and their biodiversity features of note are presented in Appendix 6.5



Figure 6.10 National sites in the vicinity of the proposed development

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## 6.3.2 HABITATS AND FLORA

### 6.3.2.1 Rare and Protected Flora

No records of plant species protected through their inclusion within the Flora (Protection) Order, 2015, were recorded during the field surveys of the Intel site and surrounding lands.

The bryophyte species *Drepanocladus aduncus* was recorded in a flush at the Leixlip Spa area at the eastern edge of the study area during the field surveys. Although listed as Least Concern on the Irish Red List<sup>22</sup>, this species has only scattered records in the southern half of Ireland<sup>23</sup>.

The rare Kildare vascular plant species *Eleocharis quinqueflora* was recorded in a flush and tufa spring the Leixlip Spa area at the eastern edge of the study area during the field surveys. Although listed as Least Concern on the Irish Red List<sup>24</sup>, this species has only scattered recent records in Kildare, and in the east of Ireland more broadly<sup>25</sup>. This species is also rare in neighbouring Co. Dublin<sup>26</sup>.

The rare Kildare vascular plant species *Lithospermum officinale* was recorded just north of the Leixlip Spa (north of the Rye Water) in the east of the study area, in a grassland area surrounded by oak-ash-hazel woodland (WN2) and wet willow-alder-ash woodland (WN6)/riparian woodland (WN5) mosaic vegetation. This species is listed as Near Threatened on the Irish Red List and has only scattered recent records in Kildare, and across (mostly central) Ireland more broadly<sup>4</sup>. This species is also rare in neighbouring Co. Dublin.

The flora species outlined above (i.e. *Drepanocladus aduncus*, *Eleocharis quinqueflora* and *Lithospermum officinale*) are considered to be of local importance (higher value) due to their status as either Least Concern or Near Threatened on the Irish Red List, and their scattered distribution.

However, none of these aforementioned species were recorded at any of the proposed tower locations or within the proposed overhead line route. Therefore, they have not been considered as a KER with regard to the proposed development.

### 6.3.2.2 Non-Native Invasive Flora

No species currently listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulations, 2011* were recorded during the 2021 surveys.

The following 20 undesirable species, which are not subject to restrictions in Irish Law, but which are considered to be invasive in some habitats and locations, were also identified within the study area (some of the species occurring as planted specimens which have then spread to greater or lesser degrees): *Conyza floribunda*, *Buddleia davidii*, *Mycelis muralis*, *Lactuca serriola*, *Aesculus hippocastanum*, *Symphoricarpos albus*, *Cupressus x leylandii*, *Sorbus aria*, *Carpinus betulus*, *Acer campestre*, *Tilia x europaea*, *Hesperis matronalis*, *Alnus incana*, *Populus sp.*, *Alnus cordata*, *Larix decidua*, *Viburnum tinus*, *Cotoneaster* species, *Lonicera* species, and *Clematis vitalba*.

### 6.3.2.3 Habitats

The following habitat types of the Heritage Council classification system (Fossitt, 2000) were identified within and directly adjacent to the proposed development site and are mapped in Figure 6.11 below.

Habitats within the proposed tower locations include artificial surfaces (BL3) at T1 consisting of the Lidl carpark, a mixture of buildings and artificial surfaces (BL3) and bare ground (ED2) associated with the car park opposite the entrance to IR96 building at sites T2 and T3, a mosaic of dry calcareous and neutral grassland (GS1) and scrub (WS1) at T4 and dry calcareous and neutral grassland (GS1) at T5. Site T6 is located on the opposite side of the Rye Water within the North Field area of the Intel grounds and consists of recolonising bare ground (ED3) and bare ground (ED2) adjacent to an area of dry meadows and grassy verges (GS2)<sup>27</sup>. T7 is located in third party farmland on the northern side of the Rye Water. No Annex I habitat types, including the priority petrifying springs with tufa formation (Cratoneurion) habitat for which the adjacent Rye Water Valley/Carlton SAC is designated, were identified at any of the proposed tower locations, as per the Interpretation Manual of European Union Habitats<sup>28</sup>.

The proposed application boundary and proposed overhead line infrastructure crosses through a variety of other habitats valued as local importance (higher value) including mixed broadleaf woodland (WD1), county importance including oak-ash-hazel woodland (WN2) and mixed broadleaf/conifer woodland (WD2) and international importance including depositing lowland rivers (FW2), rich fen and rush (PF1) and wet willow-alder-ash woodland (WN6). Although the aforementioned internationally important habitats are present within the proposed application boundary, given the nature of the works and location of the towers, no significant works are proposed for within these habitats including vegetation trimming during construction. No access tracks are proposed within any of these habitats.

The following habitats of local importance (higher value) and above have been considered a KER with regard the proposed development:

Local importance (higher value)

- dry calcareous and neutral grassland (GS1)
- scrub (WS1)
- mixed broadleaf woodland (WD1)

County importance

- oak-ash-hazel woodland (WN2)
- mixed broadleaf/conifer woodland (WD2)

International importance

- depositing lowland rivers (FW2),
- rich fen and rush (PF1)
- wet willow-alder-ash woodland (WN6)

The rich fen and flush (PF1) and wet willow-alder-ash woodland (WN6) habitats recorded within the wider study area correspond with the EU Habitats Directive Annex I 'alkaline fens (7230)' and 'Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) (\*91E0)' habitats, respectively. Whilst these habitats were recorded within the proposed development site, none of these correspond to QIs of the Rye Water Valley/ Carton SAC.

Temporary access routes for the construction phase of the proposed development will cross the Rye Water Valley/ Carton SAC. Access routes will use existing roads corresponding to BL3 habitat.

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**Figure 6.11 Habitats relevant to the proposed development**

#### **6.3.2.4 Annex I Petrifying Springs with Tufa Formation (Cratoneurion) [\*7220]**

Within Intel's ownership boundary there are three base-rich springs/streams/seepages. There are two tufa forming streams north of the Rye Water: Hamwood Stream to the east and Kellystown stream to the west. One base-rich stream was recorded on the southern riverbank of the Rye Water. Outside of Intel's ownership boundary, springs and seepages were recorded at Leixlip Spa/ Louisa Bridge, both north and south of the Rye Water. Twelve of the thirteen mapped base-rich, tufa forming springs/ streams and seepages are examples of the Annex I priority habitat Petrifying springs. The thirteenth stream, L12 KCC 148 drain outfall, comprises an outfall from a culvert with deposits of tufa along its entire length. A hydrogeological assessment of the stream inputs completed by Johnston (2022) and included in Appendix 6.6 demonstrates that the stream has negligible natural groundwater input and for this reason it does not qualify as the Annex I priority habitat \*7220. Locations of all mapped base-rich, tufa forming springs/ streams and seepages recorded are included in Figure 6.12. Full details of the Petrifying spring surveys are provided in Appendix 6.7.

This habitat is assessed as being of international importance, given its priority Annex I status and the fact that these areas of habitat are designating features of the Rye Water Valley/Cartron SAC.



Figure 6.12 Results of Petrifying Spring [\*7220] Surveys

### 6.3.3 FAUNA SURVEYS

#### 6.3.3.1 Breeding Birds

All wild birds, and their nests and eggs, are protected under the Wildlife Acts. Some bird species are also listed on Annex I of the EU Birds Directive.

There are extensive areas of suitable habitat for breeding bird species present within the wider Intel lands and surrounding area. Woodland, treeline, hedgerow, river, canal and agricultural grassland habitats support a wide range of breeding bird species. The results of the breeding bird surveys carried out to inform this assessment are summarised below.

The breeding bird surveys of the wider Intel lands recorded a total of 46 species, including; four species listed as SCIs for SPAs, one Birds Directive Annex I species, five Red list, 11 Amber list and 30 Green list bird species<sup>29</sup>. While not all of these species were recorded within the proposed development site, given their mobile nature it is likely that they could use the proposed development site.

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**Table 6.12 Birds recorded during the dedicated breeding bird surveys**

| Common name/Latin name                          | Distribution in the wider study area                                                                                                                                                               | Conservation Importance |         |             |
|-------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------|-------------|
|                                                 |                                                                                                                                                                                                    | BOCCI code              | Annex I | SCI species |
| Blackbird/ <i>Turdus merula</i>                 | Frequently recorded throughout the study area in areas of woodland, treelines, hedgerows, and along watercourses.                                                                                  | Green                   | -       | -           |
| Blackcap/ <i>Sylvia atricapilla</i>             | Recorded throughout the study area within blocks of woodland, treelines/hedgerows, and along the Rye Water.                                                                                        | Green                   | -       | -           |
| Blue tit/ <i>Cyanistes caeruleus</i>            | Frequently recorded throughout the study area in areas of woodland, treelines, hedgerows, and along watercourses.                                                                                  | Green                   | -       | -           |
| Bullfinch/ <i>Pyrrhula pyrrhula</i>             | Recorded throughout the study area within blocks of woodland within Intel's ownership boundary, and public lands at Louisa Bridge and along the canal.                                             | Green                   | -       | -           |
| Buzzard/ <i>Buteo buteo</i>                     | Recorded flying/soaring over open fields and block of woodland.                                                                                                                                    | Green                   | -       | -           |
| Chaffinch/ <i>Fringilla coelebs</i>             | Recorded within woodland and on treelines/hedgerows within the study area.                                                                                                                         | Green                   | -       | -           |
| Chiffchaff/ <i>Phylloscopus collybita</i>       | Recorded within woodland and on treelines/hedgerows within the study area.                                                                                                                         | Green                   | -       | -           |
| Coal tit/ <i>Periparus ater</i>                 | Recorded within woodland and on treelines/hedgerows within the study area.                                                                                                                         | Green                   | -       | -           |
| Dunnock/ <i>Prunella modularis</i>              | Recorded within woodland and on treelines/hedgerows within the study area.                                                                                                                         | Green                   | -       | -           |
| Feral pigeon/ <i>Columba livia f. domestica</i> | Recorded on treelines within the Intel facility itself, and along the canal.                                                                                                                       | Green                   | -       | -           |
| Goldcrest/ <i>Regulus regulus</i>               | Recorded within woodland and on treelines/hedgerows within the study area.                                                                                                                         | Amber                   | -       | -           |
| Goldfinch/ <i>Carduelis carduelis</i>           | Recorded within woodland and on treelines/hedgerows within the study area.                                                                                                                         | Green                   | -       | -           |
| Great tit/ <i>Parus major</i>                   | Recorded within woodland within the study area.                                                                                                                                                    | Green                   | -       | -           |
| Greenfinch/ <i>Chloris chloris</i>              | Recorded twice within the north-eastern field on 3 <sup>rd</sup> June 2021, on the edge of the woodland bordering the Hamwood stream, and along the road.                                          | Amber                   | -       | -           |
| Grey heron/ <i>Ardea cinerea</i>                | Recorded twice within the study area, foraging along the Rye Water, and the canal.                                                                                                                 | Green                   | -       | Yes         |
| Grey wagtail/ <i>Motacilla cinerea</i>          | Recorded once within the study area, foraging along the Rye Water.                                                                                                                                 | Red                     | -       | -           |
| Herring gull/ <i>Larus argentatus</i>           | Recorded flying over the study area on several occasions. Noted to be perched on a building within the Intel facility on one occasion. This species is unlikely to breeding within the study area. | Amber                   | -       | Yes         |

| Common name/Latin name                       | Distribution in the wider study area                                                                                                   | Conservation Importance |         |             |
|----------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|-------------------------|---------|-------------|
|                                              |                                                                                                                                        | BOCCI code              | Annex I | SCI species |
| Hooded crow <i>Corvus corone</i>             | Recorded throughout the study area, within the Intel facility itself, and within the surrounding woodland and fields.                  | Green                   | -       | -           |
| House martin <i>Delichon urbicum</i>         | Recorded foraging over fields and waterbodies within the study area.                                                                   | Amber                   | -       | -           |
| House sparrow <i>Passer domesticus</i>       | Recorded on treelines within the Intel facility.                                                                                       | Amber                   | -       | -           |
| Jackdaw <i>Corvus monedula</i>               | Recorded within a range of habitats in the study area, inside and outside of the existing Intel facility.                              | Green                   | -       | -           |
| Jay <i>Garrulus glandarius</i>               | Recorded twice along woodland edge, in close proximity to the Rye Water.                                                               | Green                   | -       | -           |
| Kingfisher <i>Alcedo atthis</i>              | Recorded once, foraging along the Rye Water.                                                                                           | Amber                   | Yes     | Yes         |
| Long-tailed tit <i>Aegithalos caudatus</i>   | Recorded in groups within woodland present along the Rye Water.                                                                        | Green                   | -       | -           |
| Magpie <i>Pica pica</i>                      | Recorded within a range of habitats in the study area, inside and outside of the existing Intel facility.                              | Green                   | -       | -           |
| Mallard <i>Anas platyrhynchos</i>            | Recorded in waterbodies within the study area, including the Rye Water, the canal, and the attenuation pond inside the Intel facility. | Amber                   | -       | Yes         |
| Meadow pipit <i>Anthus pratensis</i>         | Recorded within agricultural grassland habitat.                                                                                        | Red                     | -       | -           |
| Mistle thrush <i>Turdus viscivorus</i>       | Recorded in woodland and grassland habitat within the study area.                                                                      | Green                   | -       | -           |
| Moorhen <i>Gallinula chloropus</i>           | Recorded once, along the canal.                                                                                                        | Green                   | -       | -           |
| Pheasant <i>Phasianus colchicus</i>          | Recorded in woodland and grassland habitat within the study area.                                                                      | Green                   | -       | -           |
| Pied wagtail <i>Motacilla alba yarrellii</i> | Recorded on artificial surfaces and bare ground habitats within the study area.                                                        | Green                   | -       | -           |
| Raven <i>Corvus corax</i>                    | Recorded in woodland habitats within the study area.                                                                                   | Green                   | -       | -           |
| Reed bunting <i>Emberiza schoeniclus</i>     | Recorded once, on the edge of woodland bordering the Rye Water.                                                                        | Green                   | -       | -           |
| Robin <i>Erithacus rubecula</i>              | Recorded within woodland and on treelines/hedgerows within the study area.                                                             | Green                   | -       | -           |
| Rook <i>Corvus frugilegus</i>                | Recorded within a range of habitats in the study area, inside and outside of the existing Intel facility.                              | Green                   | -       | -           |
| Song thrush <i>Turdus philomelos</i>         | Recorded within woodland and on treelines/hedgerows within the study area.                                                             | Green                   | -       | -           |
| Starling <i>Sturnus vulgaris</i>             | Recorded within woodland and on treelines/hedgerows within the study area.                                                             | Amber                   | -       | -           |
| Stock dove <i>Columba oenas</i>              | Recorded once within woodland within the study area.                                                                                   | Red                     | -       | -           |
| Swallow <i>Hirundo rustica</i>               | Recorded foraging over fields within the study area.                                                                                   | Amber                   | -       | -           |

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28 NOV 2022

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| Common name/Latin name                       | Distribution in the wider study area                                                                      | Conservation Importance |         |             |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------|-------------------------|---------|-------------|
|                                              |                                                                                                           | BOCCI code              | Annex I | SCI species |
| Swift <i>Apus apus</i>                       | Recorded foraging and flying over fields and woodland within the study area.                              | Red                     | -       | -           |
| Tree sparrow <i>Passer montanus</i>          | Recorded within the Intel facility, in close proximity to the Rye Water, and along the canal.             | Amber                   | -       | -           |
| Whitethroat <i>Sylvia communis</i>           | Recorded once within treeline habitat within the study area.                                              | Green                   | -       | -           |
| Willow warbler <i>Phylloscopus trochilus</i> | Recorded within woodland and on treelines/hedgerows within the study area.                                | Amber                   | -       | -           |
| Woodpigeon <i>Columba palumbus</i>           | Recorded within a range of habitats in the study area, inside and outside of the existing Intel facility. | Green                   | -       | -           |
| Wren <i>Troglodytes troglodytes</i>          | Recorded within woodland and on treelines/hedgerows within the study area.                                | Green                   | -       | -           |
| Yellowhammer <i>Emberiza citrinella</i>      | Recorded once within the study area, on a treeline adjacent to agricultural grassland.                    | Red                     | -       | -           |

### 6.3.3.2 SCI Breeding Bird Species

Four SCI bird species for which European sites are designated were recorded within the study area however, these species recorded within the study area are unlikely to support any SCI population. The nearest European site designated for grey heron is Wexford Harbour and Slob SPA, c. 97.5 km south of the study area. Grey herons, although they have an extensive geographic range, are generally sedentary in Ireland, meaning they do not travel long distances between their breeding and wintering grounds<sup>30</sup>, and for this reason, the population of birds in the study area are not considered to be part of any European site population. Grey heron recorded within the study area are considered to be of local importance (higher value).

The nearest European site designated for mallard is Dundalk Bay SPA, c. 56 km north of the study area. Breeding mallards in Ireland are largely sedentary, and Dundalk Bay SPA is designated for wintering populations of mallard, the population of which is increased by migratory individuals from Europe<sup>31</sup>. Therefore, the population of birds in the study area are not considered to be part of any European site population. Mallard recorded within the study area are considered to be of local importance (higher value).

The nearest European site designated for kingfisher is the River Boyne and Blackwater SPA, located c. 29 km away and in a different catchment to the study area. Therefore, kingfisher recorded within the study area are not considered to be part of any European site population. Kingfisher recorded within the study area are considered to be of national importance, due to its status as an Annex I bird species.

The nearest European site designated for herring gull is Ireland's Eye SPA, located c. 30 km away. This species is a common urban bird species, with large populations residing in the greater Dublin area. It is unlikely that breeding populations of herring gull associated with Ireland's Eye SPA would forage as far inland as Leixlip, as there are extensive foraging areas in the marine environment surrounding Ireland's Eye, and terrestrial habitats in Dublin. Herring gull recorded within the study area are considered to be of local importance (higher value).

### 6.3.3.3 Other Breeding Bird Species

Non-SCI breeding bird species recorded within the study area include five Red list, 11 Amber list and 30 Green list bird species. Due to their particularly threatened conservation status, all Red list species are valued as being of county importance (grey wagtail, meadow pipit, stock dove, swift and yellowhammer). All other Amber and Green list species are valued as being of local importance (higher value).

With regard this assessment, the highest evaluation for a single species has been taken and applied on a precautionary basis to all breeding birds. Thus, breeding birds are considered to be of national importance, primarily due to the presence of kingfisher and its status as an annex I bird species.



**Figure 6.13 Breeding birds recorded within the wider survey area<sup>14</sup>**

#### 6.3.3.4 Wintering Birds

There are extensive areas of suitable habitat for wintering bird species present within the wider study area. Woodland, treeline, hedgerow, river, canal and agricultural grassland habitats support a wide range of bird species. The results of the wintering bird surveys carried out to inform this assessment are summarised below.

The dedicated bird surveys recorded a total of 55 species across the wider study area, including; nine species listed as SCIs for SPAs, three Birds Directive Annex I species, nine Red list, 14 Amber list and 34 Green list bird species<sup>32</sup>. While not all of these species were recorded within the proposed development site, given their mobile nature it is likely that they could use the proposed development site.

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Planning Department  
28 NOV 2022  
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<sup>14</sup> mapped according to BOCCI code

**Table 6.13 Wintering bird species recorded during the dedicated surveys**

| Common name/Latin name                              | Conservation Importance |         |             |
|-----------------------------------------------------|-------------------------|---------|-------------|
|                                                     | BOCCI code              | Annex I | SCI species |
| Blackbird <i>Turdus merula</i>                      | Green                   | -       | -           |
| Blackcap <i>Sylvia atricapilla</i>                  | Green                   | -       | -           |
| Black-headed gull <i>Chroicocephalus ridibundus</i> | Amber                   | -       | Yes         |
| Blue tit <i>Cyanistes caeruleus</i>                 | Green                   | -       | -           |
| Bullfinch <i>Pyrrhula pyrrhula</i>                  | Green                   | -       | -           |
| Buzzard <i>Buteo buteo</i>                          | Green                   | -       | -           |
| Chaffinch <i>Fringilla coelebs</i>                  | Green                   | -       | -           |
| Chiffchaff <i>Phylloscopus collybita</i>            | Green                   | -       | -           |
| Coal tit <i>Periparus ater</i>                      | Green                   | -       | -           |
| Common gull <i>Larus canus</i>                      | Amber                   | -       | Yes         |
| Cormorant <i>Phalacrocorax carbo</i>                | Amber                   | -       | Yes         |
| Dipper <i>Cinclus cinclus</i>                       | Green                   | -       | -           |
| Dunnock <i>Prunella modularis</i>                   | Green                   | -       | -           |
| Goldcrest <i>Regulus regulus</i>                    | Amber                   | -       | -           |
| Golden plover <i>Pluvialis apricaria</i>            | Red                     | Yes     | Yes         |
| Goldfinch <i>Carduelis carduelis</i>                | Green                   | -       | -           |
| Great spotted woodpecker <i>Dendrocopos major</i>   | Green                   | -       | -           |
| Great tit <i>Parus major</i>                        | Green                   | -       | -           |
| Greenfinch <i>Chloris chloris</i>                   | Amber                   | -       | -           |
| Grey heron <i>Ardea cinerea</i>                     | Green                   | -       | Yes         |
| Grey wagtail <i>Motacilla cinerea</i>               | Red                     | -       | -           |
| Herring gull <i>Larus argentatus</i>                | Amber                   | -       | Yes         |
| Hooded crow <i>Corvus corone</i>                    | Green                   | -       | -           |
| House sparrow <i>Passer domesticus</i>              | Amber                   | -       | -           |
| Jackdaw <i>Corvus monedula</i>                      | Green                   | -       | -           |
| Jay <i>Garrulus glandarius</i>                      | Green                   | -       | -           |
| Kestrel <i>Falco tinnunculus</i>                    | Red                     | -       | -           |
| Kingfisher <i>Alcedo atthis</i>                     | Amber                   | Yes     | Yes         |
| Lesser black-backed gull <i>Larus fuscus</i>        | Amber                   | -       | Yes         |
| Linnet <i>Linaria cannabina</i>                     | Amber                   | -       | -           |
| Little egret <i>Egretta garzetta</i>                | Green                   | Yes     | -           |
| Long-tailed tit <i>Aegithalos caudatus</i>          | Green                   | -       | -           |
| Magpie <i>Pica pica</i>                             | Green                   | -       | -           |
| Mallard <i>Anas platyrhynchos</i>                   | Amber                   | -       | Yes         |
| Meadow pipit <i>Anthus pratensis</i>                | Red                     | -       | -           |
| Mistle thrush <i>Turdus viscivorus</i>              | Green                   | -       | -           |
| Moorhen <i>Gallinula chloropus</i>                  | Green                   | -       | -           |
| Mute swan <i>Cygnus olor</i>                        | Amber                   | -       | -           |
| Pheasant <i>Phasianus colchicus</i>                 | Green                   | -       | -           |
| Pied wagtail <i>Motacilla alba yarrellii</i>        | Green                   | -       | -           |
| Raven <i>Corvus corax</i>                           | Green                   | -       | -           |
| Redpoll <i>Acanthis flammea</i>                     | Green                   | -       | -           |
| Redwing <i>Turdus iliacus</i>                       | Red                     | -       | -           |
| Robin <i>Erithacus rubecula</i>                     | Green                   | -       | -           |
| Rook <i>Corvus frugilegus</i>                       | Green                   | -       | -           |
| Siskin <i>Spinus spinus</i>                         | Green                   | -       | -           |
| Skylark <i>Alauda arvensis</i>                      | Amber                   | -       | -           |
| Snipe <i>Gallinago gallinago</i>                    | Red                     | -       | -           |
| Song thrush <i>Turdus philomelos</i>                | Green                   | -       | -           |

| Common name/Latin name                  | Conservation Importance |         |             |
|-----------------------------------------|-------------------------|---------|-------------|
|                                         | BOCCI code              | Annex I | SCI species |
| Sparrowhawk <i>Accipiter nisus</i>      | Green                   | -       | -           |
| Starling <i>Sturnus vulgaris</i>        | Amber                   | -       | -           |
| Treecreeper <i>Certhia familiaris</i>   | Green                   | -       | -           |
| Woodpigeon <i>Columba palumbus</i>      | Green                   | -       | -           |
| Wren <i>Troglodytes troglodytes</i>     | Green                   | -       | -           |
| Yellowhammer <i>Emberiza citrinella</i> | Red                     | -       | -           |

### 6.3.3.5 SCI and Annex I Wintering Bird Species

Nine SCI bird species for which European sites are designated were recorded within the study area. Four of these species were also recorded during breeding bird surveys: grey heron, herring gull, kingfisher and mallard. As described in detail in 6.3.3.1, none of the aforementioned species recorded within the study area are considered to be part of any European site population due to distance between the nearest European site designated for these species, and the study area. As outlined above, grey heron, herring gull and mallard populations recorded within the study area are considered to be of local importance (higher value) and kingfisher is considered to be of national importance due to its status as an Annex I species.

The nearest European site designated for black-headed gull is South Dublin Bay and River Tolka Estuary SPA, located c. 18.5 km away. This species is a common urban bird species, with large populations residing in the greater Dublin area. It is unlikely that wintering populations of black-headed gull associated with South Dublin Bay and River Tolka Estuary SPA would forage as far inland as Leixlip, as there are extensive foraging areas in the marine environment surrounding South Dublin Bay, and terrestrial habitats in Dublin. Black-headed gull recorded within the study area are considered to be of local importance (higher value).

The nearest European site designated for common gull is Dundalk Bay SPA, located c. 56 km away. It is unlikely that wintering populations of common gull associated with Dundalk Bay SPA would forage as far inland as Leixlip, as there are extensive foraging areas in the marine environment surrounding Dundalk Bay SPA, and agricultural lands in Louth, Meath and Dublin. Common gull recorded within the study area are considered to be of local importance (higher value).

The nearest European site designated for cormorant is Ireland's Eye SPA, located c. 29 km away. The population associated with Ireland's Eye is a breeding colony. Cormorant breed mainly in colonies around the coast of Ireland, with some birds breeding inland. Cormorant are known to winter inland on rivers and lakes, however this species is known to forage up to 20-25 km from its wintering roosts or breeding colonies, with most foraging trips confined to within 10 km of the colony<sup>15</sup>. Therefore any cormorants noted within the proposed development site are unlikely to be associated with the wintering or breeding populations of any SPAs. However, on a precautionary basis, cormorant present within the study area are valued as national importance.

The nearest European site designated for golden plover is North Bull Island SPA, located c. 21.6 km away. It is unlikely that wintering populations of golden plover associated with North Bull Island SPA would forage as far inland as Leixlip, as there are extensive foraging areas in the marine environment surrounding Dublin Bay. Golden plover recorded within the study area are considered to be of national importance, due to their status as an Annex I bird species.

The nearest European site designated for lesser black-backed gull is Lambay Island SPA, located c. 33.8 km away. The population associated with Lambay Island SPA is a breeding population. This species is an urban bird species, with populations residing in the greater Dublin area. It is unlikely that wintering populations of lesser black-backed gull associated with Lambay Island SPA would forage as far inland as Leixlip, as there are extensive foraging areas in the marine environment surrounding Lambay Island SPA, and terrestrial habitats in Dublin. Additionally, there is some evidence to suggest that Irish breeding populations of lesser black-backed gull migrate south to Iberia and northwest Africa for the winter months<sup>33</sup>. Lesser black-backed gull recorded within the study area are considered to be of local importance (higher value).

<sup>15</sup> Great Cormorant (*Phalacrocorax carbo*) - BirdLife species factsheet

Little egret is listed as an Annex I bird species, however, no SPAs in Ireland have been designated for populations of little egret. The populations of this species have expanded rapidly in Ireland over the last two decades, and it is considered to be a Green list species. Therefore, little egret recorded within the study area are considered to be of local importance (higher value).

### 6.3.3.6 Other Wintering Bird Species

Non-SCI wintering bird species recorded within the study area include six Red list, seven Amber list and 32 Green list bird species. Due to their particularly threatened conservation status, all Red list species are valued as being of county importance (grey wagtail, kestrel, meadow pipit, redwing, snipe and yellowhammer). All other Amber and Green list species are valued as being of local importance (higher value).

With regard this assessment, the highest evaluation for a single species has been taken and applied on a precautionary basis to all wintering birds. Thus, wintering birds are considered to be of national importance, primarily due to the presence of annex I bird species.



Figure 6.14 Wintering birds recorded within the wider survey area<sup>16</sup>

### 6.3.3.7 Bats

#### Walked transect surveys

Three no. transect surveys were carried out of the wider study area in summer 2021. A total of six bat species were recorded as being present within the study area during transect surveys, including *Pipistrellus pipistrellus*, *Pipistrellus pygmaeus*, *Pipistrellus nathusii*, *Nyctalus leisleri*, *Plecotus auritus* and *Myotis sp.* Therefore, at least six of Ireland's nine bat species are present within the study area.

The transect surveys focused on areas of suitable commuting and foraging habitat, including woodland, hedgerows and treelines, and watercourses. Transects covered the wider study area, including farmland and woodland in the north and south of the study area, Louisa Bridge, sections of the Royal Canal, and the Intel

<sup>16</sup> mapped according to BOCCI code

facility itself. The transect within the Intel facility focused on hedgerows and treelines along the boundaries of the facility, as well as woodland located to the south of the Rye Water. Bat activity was lower within the Intel facility and along lit public roads. This is due to the fragmented nature of suitable commuting and foraging habitat within these locations, and the presence of artificial light. These features within the facility and along the R148 are considered to be of 'Low' suitability for commuting and foraging bats based on evaluation against Collins (2016), as they are not very well connected to the surrounding landscape. Exceptions to this include the hedgerows along the east and west boundaries and the woodland located north of the facility, discussed below.

Features within the study area which are considered to be of 'Moderate' suitability for bats include planted broadleaf woodland, treelines and hedgerows associated with houses, and the boundary hedgerows of the Intel facility to the east and west. These features represent continuous habitat which is connected to the wider landscape that can be used by bats for commuting and foraging. Very little light spill was noted along these features. A range of bat species were recorded along these features, including *Pipistrellus pipistrellus* Common pipistrelle, *Pipistrellus pygmaeus* Soprano pipistrelle, *Nyctalus leisleri* Leisler's bat, *Myotis sp.*, *Plecotus auritus* Brown long-eared bat and *Pipistrellus nathusii* Nathusius' pipistrelle.

High levels of bat activity were recorded along the Rye Water and the Royal Canal. These corridors, and areas of semi-natural woodland within the study area (including blocks of woodland north and south of the Rye Water, along the Hamwood Stream, and at Louisa Bridge) are considered to be 'High' suitability bat commuting and foraging corridors as they represent dark, continuous, high-quality habitat that is well connected to the wider landscape and is likely to be used regularly by commuting bats.

#### Tree inspection surveys

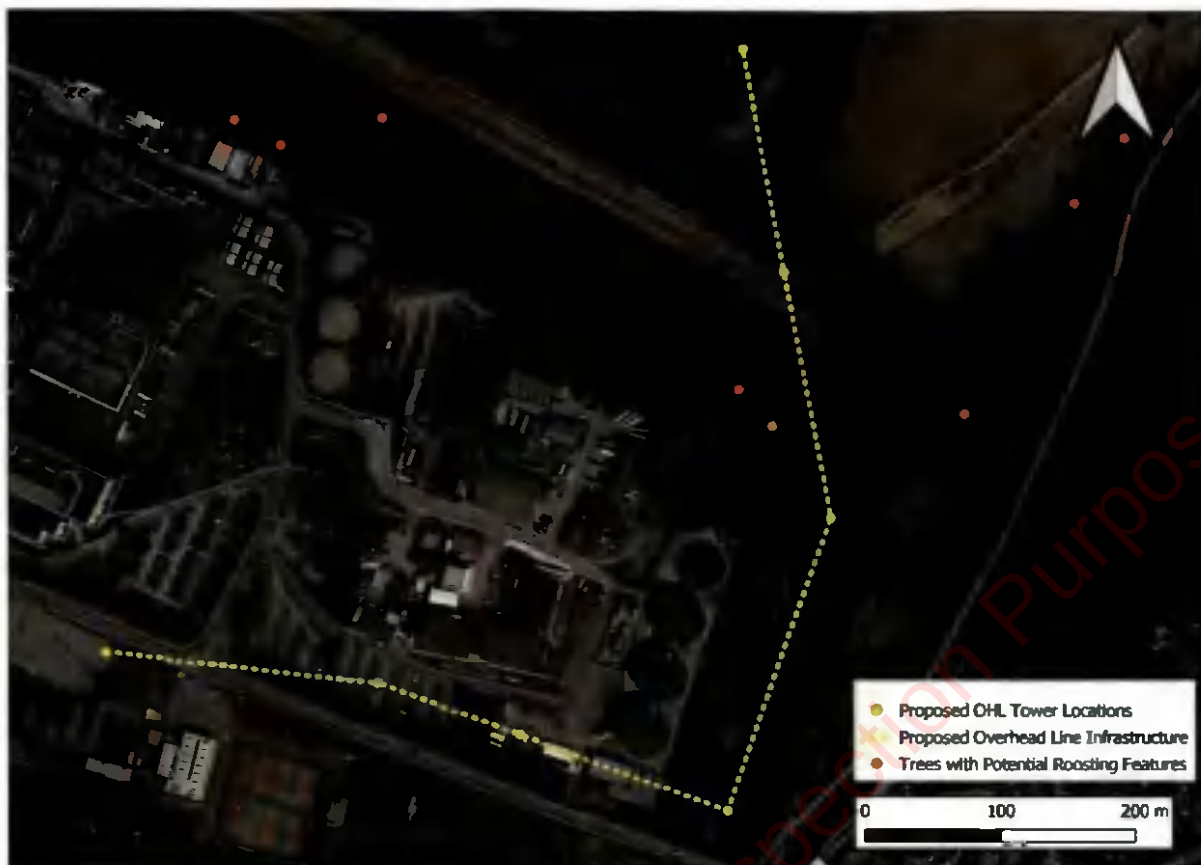
Tree inspection surveys from ground level were carried out concurrently with the mammal surveys. Trees within the wider survey area were examined from ground level for any potential roosting features (PRFs). Given the size of the site, the number of trees present, and that these surveys were carried out in the summer months, it is likely that there are more trees with suitability for roosting bats than were recorded during the surveys. PRFs recorded, within and adjacent to the proposed development site, during these surveys are indicated in Figure 6.15 below.

No works, including tree trimming or topping are proposed to any of the PRF trees shown below as outlined within the Tree Impact/Protection Plan drawing prepared by Independent Tree Services for the proposed development.

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**Figure 6.15 PRFs within and adjacent to the proposed development site**

#### Static detector activity surveys

The automated static bat detectors were placed in areas of woodland that were not accessible to surveyors during the activity transect surveys. All three locations chosen are considered to be highly suitable bat commuting and foraging corridors as they are located within blocks of woodland located along watercourses. In total, five bat species were recorded on automated static bat detectors deployed within the survey area, including: Leisler's bat, Nathusius' pipistrelle, common pipistrelle, soprano pipistrelle, brown long-eared bat, and unidentified *Myotis* bat species. Full details of the static detector results are provided in Table 6.14.

**Table 6.14 Results of automated static bat detector surveys**

| Static no. | Habitat description                                                                                                                                                                                                                                                            | Deployment dates                | Number of nights recorded | Species recorded (overall total number of calls) <sup>17</sup>                                                                                                          |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1          | Automated detector placed within an area of oak-ash-hazel woodland (WN2) along the Hamwood stream, on the north-eastern boundary of the survey area.                                                                                                                           | 10th August to 18th August 2021 | 8                         | <i>Myotis</i> species (140)<br>Leisler's bat (2)<br>Common pipistrelle (206)<br>Soprano pipistrelle (5,252)<br>Brown long-eared bat (4)                                 |
| 2          | Automated detector placed within an area of plantation (Mixed) broadleaved woodland (WD1) on the north bank of the Rye Water.                                                                                                                                                  | 10th August to 18th August 2021 | 8                         | <i>Myotis</i> species (1)<br>Leisler's bat (53)<br>Common pipistrelle (37)<br>Soprano pipistrelle (174)                                                                 |
| 3          | Automated detector placed within an area of Annex I Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> ( <i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i> ) [*91E0] on the south bank of the Rye Water, north of the Intel facility. | 23rd July to 10th August 2021.  | 18                        | <i>Myotis</i> species (136)<br>Leisler's bat (75)<br>Nathusius' pipistrelle (17)<br>Common pipistrelle (610)<br>Soprano pipistrelle (5603)<br>Brown long-eared bat (10) |

### 6.3.3.8 Ecological valuation of bat species recorded within the study area

#### Common pipistrelle *Pipistrellus pipistrellus*

Common pipistrelle was recorded widely throughout the study area, foraging and commuting along suitable habitat features including woodland, hedgerows and treelines, as well as within the Intel facility itself. This species was recorded by all three static bat detectors. Four no. small common pipistrelle roosts were recorded within the wider study area during dedicated surveys.

The common pipistrelle bat population within the study area is valued as being of local importance (higher value) given their conservation status of "Least Concern" (Marnell et al., 2019) and that they are a common bat species.

#### Soprano pipistrelle *Pipistrellus pygmaeus*

Soprano pipistrelle was recorded widely throughout the study area, foraging and commuting along suitable habitat features including woodland, hedgerows and treelines. Particularly high levels of activity were recorded along the Royal Canal and the Rye Water. This species was also recorded by all three static bat detectors. Two no. soprano pipistrelle roosts were recorded during the dedicated surveys of the wider study area surveys, one of which is likely to be a maternity roost.

Although a maternity roost was recorded for this species within the wider study area, no roosts were recorded within the proposed development site and there are no suitable features present to support a maternity roost within any of the proposed tower location or along the proposed overhead line route. Additionally, soprano pipistrelle have a conservation status of "Least Concern" (Marnell et al., 2019) and are commonly found across the study area. In light of the above, the soprano pipistrelle population within the study area is valued as being of local importance (higher value).

<sup>17</sup> The number of bat calls is provided beside each species in brackets. To note, this does not necessarily correspond to the exact number of bats using the lands; however, it does provide an indication of usage by a particular bat species at that location

**Nathusius' pipistrelle *Pipistrellus nathusii***

Nathusius' pipistrelle were recorded in five locations during activity surveys, along the Rye Water and adjacent to hedgerow/treeline habitats. This species was also recorded by static detector no. 3, north of the Rye Water to the east of the study area. No Nathusius' pipistrelle roosts were recorded.

Nathusius' pipistrelle have a conservation status of "Least Concern" (Marnell et al., 2019) however, given the low numbers of this species recorded in Co. Kildare, and the overall lack of data available for this species in Ireland, the local population of this species is valued as being of county importance.

**Leisler's bat *Nyctalus leisleri***

Leisler's bat was recorded widely throughout the study area, foraging and commuting along suitable habitat features including woodland, hedgerows and treelines, as well along well-lit roads and within the Intel facility itself. This species was also recorded by all three static bat detectors. No roosts for this species were recorded within the study area.

The Leisler's bat population within the study area is valued as being of local importance (higher value) given their conservation status of "Least Concern" (Marnell et al., 2019) and that they are a common bat species.

**Brown long-eared bat *Plecotus auritus***

Brown long-eared bat were recorded in discrete locations within the study area, along the Rye Water, hedgerows, treelines and associated with the houses north of the Intel facility. This species was also recorded by static detectors no. 1 and 3. Two roost of brown long-eared bat were recorded during the dedicated surveys of the wider study area.

The brown long-eared bat population within the study area is valued as being of local importance (higher value) given their conservation status of "Least Concern" (Marnell et al., 2019) and that they are a common bat species.

**Myotis species**

There are three no. *Myotis* bat species in Ireland: *Myotis daubentonii*, *Myotis mystacinus* and *Myotis nattereri*. The calls of these species can be difficult to differentiate, which is why they have been grouped together for the purposes of this assessment. *Myotis* species were recorded throughout the study area, particularly along the Rye Water, and along woodland, hedgerow and treeline habitats to the north of the Intel facility. *Myotis* species were recorded by all three static detectors. One single bat *Myotis sp.* roost was recorded during the dedicated survey.

The *Myotis* bat populations within the study area are valued as being of local importance (higher value) given their conservation status of "Least Concern" (Marnell et al., 2019) and that they are common bat species.

With regard this assessment, the highest evaluation for a single species has been taken and applied on a precautionary basis to all bats. Thus, bats are considered to be of county importance, primarily due to the presence of Nathusius pipistrelle and the low numbers of this species recorded in Co. Kildare.

**6.3.3.9 Mammals (excluding bats)**

Dedicated surveys for signs of all mammal species were carried out within the wider survey area. The results of these surveys, within and adjacent to the proposed development site are mapped in Figure 6.16, and discussed below.



**Figure 6.16 Mammals recorded within and adjacent to the proposed development site**

### 6.3.3.10 Otter

Otter, and their breeding and resting places, are protected under the Wildlife Acts. Otter are also listed on Annex II and Annex IV of the EU Habitats Directive and are afforded strict protection under the Habitats Directive (Birds and the Habitats) Regulations.

Mammal surveys were carried out during daytime hours, and recorded signs of mammal activity. Many signs of otter activity were recorded during mammal surveys of the Rye Water channel. These signs of otter activity recorded include spraints, prints, remains of food (including white-clawed crayfish remains), slides, couches, and openings which were considered to be potential holt entrances. Additionally, a live otter was recorded during a bat emergence survey of Sandford's Bridge on 8<sup>th</sup> July 2021. This individual was recorded feeding along the Rye Water for the duration of the bat survey, from approximately 10pm until 12am.

In an Irish context, the conservation concern of otter is 'Least Concern' (Marnell et al. 2019) due to population recoveries since 2009. However, otter remains 'Near Threatened' at a European and Global context, as per the International Union for Conservation of Nature (IUCN) Red List of Threatened Species (Roos et al. 2015). The otter population valued as being of county importance as it is listed on Annex II of the Habitats Directive and is considered to be a species of high conservation concern, but it is not likely to be associated with the qualifying interest otter populations of any SAC.

### 6.3.3.11 Badger

Badger, and their breeding and resting places, are protected under the Wildlife Acts. Badgers are known to be present within the study area and have been recorded within the Intel facility in the past. There is a known active badger sett within the hedgerow running north to south between the proposed development site and the Royal Canal. These setts are subject to ongoing monitoring by Scott Cawley Ltd as part of a mitigation plan for a previous planning application.

Mammal surveys carried out within the wider survey area recorded several signs of badger activity, particularly in areas of woodland. Signs of badger activity recorded included faeces, snuffle holes, prints, and

both active and inactive setts. Other mammal signs recorded within the wider study area which may be attributed to badger include mammal tracks. Active badger setts were recorded along the northern boundary of the Alleckcastle lands, adjacent to the Royal Canal, within a block of plantation broadleaf woodland in the middle of the study area, and within the woodland to the west of the Hamwood Stream.

The local badger population is deemed to be of local importance (higher value) due to the known presence of resident populations within the wider study area, and the protection afforded to badgers under the Wildlife Acts.

#### 6.3.3.12 Other mammal species

Although not recorded during mammal surveys, other mammal species protected under the Wildlife Acts, such as Irish stoat *Mustela erminea*, hedgehog *Erinaceus europaeus* and pygmy shrew *Sorex minutus*, are likely to be present and widespread within the areas of suitable habitat located within the study area (i.e. agricultural fields bordered by hedgerows and treelines, woodland, scrub and vegetated river banks). The ecological value of these other small mammal species is deemed to be of local importance (higher value) due to the protection afforded to these species under the Wildlife Acts.

Evidence of other mammals which are not protected under the Wildlife Acts were recorded within the study area. These species include fox *Vulpes vulpes*, fallow deer *Dama dama* and rabbit *Orytolagus cuniculus*. Evidence of these species including burrows, faeces and sightings of individuals were recorded across the study area within areas of suitable habitat. It is also likely that species such as wood mouse *Apodemus sylvaticus*, house mouse *Mus musculus* and brown rat *Rattus norvegicus* are present within the study area. Although these species are not afforded legal protection under the Wildlife Acts, they form part of the local biodiversity resource and are noted here in that context. These unprotected mammal species are deemed to be of local importance (lower value).

#### 6.3.3.13 Molluscs

The findings of the habitat suitability surveys along the Hamwood Stream, Kellystown Lane, and the north and south banks of the Rye Water, concluded that the fringing wetland habitat was unsuitable to support *Vertigo moulinsiana* and *Vertigo angustior*. The vegetation along the river's edge was either completely dry underfoot or entirely under water with evidence of fluctuating water levels (scour marks and flood debris higher the water levels at the time of the survey) and therefore, did not have the degree of wetness and stable hydrogeological/hydrological conditions necessary to support either species.

*Vertigo moulinsiana* are known to occur in the marsh/fen vegetation at Louisa Bridge, east of the proposed development site. *Vertigo angustior* were not recorded at Louisa Bridge during the detailed surveys in 2021 with the last record of the species at Louisa Bridge from 1997. None of the proposed tower locations or the proposed overhead line infrastructure route cross through sites where *Vertigo moulinsiana* have been recorded. Additionally, the proposed overhead line infrastructure route does not have the correct degree of wetness or the stable hydrogeological/hydrological conditions necessary to support either of the protected species of whorl snail; *Vertigo angustior* or *Vertigo moulinsiana* for which the Rye Water Valley SAC is designated.

However, on a precautionary basis, mollusc within the proposed development site have been valued as being of international importance as they are a qualifying interest of the adjacent Rye Water Valley /Carton SAC and given the close proximity of the proposed development site to the aforementioned European site.

#### 6.3.3.14 White-clawed crayfish

The White-clawed crayfish *Austropotamobius pallipes* is listed on Annex II and Annex V of the Habitats Directive and the species is protected in Ireland under the Wildlife Acts. Although no species-specific surveys were carried out during the baseline surveys of the wider Intel lands for white-clawed crayfish, evidence of this species was recorded during mammal surveys. Freshwater habitats within the survey area are considered to be suitable to support white-clawed crayfish as the species is known utilise a range of freshwater habitats in Ireland in areas where there is sufficient lime. The soil and bedrock geology in the Leixlip area is calcareous in nature and therefore, aquatic habitats in this area are calcium/lime-rich.

Remains of five no. crayfish carapaces were found in two no. locations along the Rye Water, north of the Intel facility. These remains were signs of otter activity. An additional dead crayfish was recorded on the Rye Water, where it passes through Louisa Bridge. This individual was mostly intact and therefore not considered to be otter feeding remains. Additionally, previous surveys of the Rye Water carried out by Scott Cawley in 2016 recorded live specimens of crayfish within the waterbody.

This section of the Rye Water is within the favourable reference range for white-clawed crayfish (NPWS, 2019). For this reason, and due to the protection afforded to these species under the Wildlife Acts. The ecological value of the white-clawed crayfish population is deemed to be of county importance.



**Figure 6.17 Crayfish records within the wider Intel lands**

#### **6.3.4 SUMMARY OF ECOLOGICAL EVALUATION**

Table 6.15 summarises the ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identifies the Key Ecological Receptors (KERs). Species, habitats and features not qualifying as KERs are not subjected to impact assessment in line with current best practice of assessing the impacts on what are determined to be important ecological or biodiversity features: CIEEM and NRA guidelines (CIEEM, 2018 and NRA, 2009).



**Table 6.15 Ecological evaluation of all receptors taking into consideration legal protection, conservation status and local abundance, and identification of the Key Ecological Receptors (KERs).**

| Ecological Receptor                                                                                                              | Ecological Valuation            | KER? |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------|------|
| <b>Designated Sites</b>                                                                                                          |                                 |      |
| Rye Water Valley/Carton SAC                                                                                                      | International                   | Yes  |
| North Dublin Bay SAC                                                                                                             | International                   | Yes  |
| South Dublin Bay SAC                                                                                                             | International                   | Yes  |
| North Bull Island SPA                                                                                                            | International                   | Yes  |
| South Dublin Bay and River Tolka Estuary SPA                                                                                     | International                   | Yes  |
| Rye Water Valley/Carton pNHA                                                                                                     | National                        | Yes  |
| Royal Canal pNHA                                                                                                                 | National                        | No   |
| Liffey Valley pNHA                                                                                                               | National                        | Yes  |
| Dolphins, Dublin Docks pNHA                                                                                                      | National                        | Yes  |
| North Dublin Bay pNHA                                                                                                            | National                        | Yes  |
| South Dublin Bay pNHA                                                                                                            | National                        | Yes  |
| Other European sites (SACs and SPAs)                                                                                             | International                   | No   |
| Other NHAs and pNHAs                                                                                                             | National                        | No   |
| <b>Habitats</b>                                                                                                                  |                                 |      |
| Dry calcareous and neutral grassland (GS1)                                                                                       | Local importance (higher value) | Yes  |
| Scrub (WS1)                                                                                                                      | Local importance (lower value)  | Yes  |
| Mixed broadleaf woodland (WD1)                                                                                                   | Local importance (lower value)  | Yes  |
| Recolonising bare ground (ED3)                                                                                                   | Local importance (lower value)  | No   |
| Buildings and artificial surfaces (BL3)                                                                                          | Local importance (lower value)  | No   |
| Dry meadows and grassy verges (GS2)                                                                                              | Local importance (lower value)  | No   |
| Recolonising bare ground (ED3)                                                                                                   | Local importance (lower value)  | No   |
| Spoil and bare ground (ED2)                                                                                                      | Local importance (lower value)  | No   |
| Oak-ash-hazel woodland (WN2)                                                                                                     | County importance               | Yes  |
| Mixed broadleaf/conifer woodland (WD2)                                                                                           | County importance               | Yes  |
| Depositing lowland rivers (FW2)                                                                                                  | International importance        | Yes  |
| Rich fen and rush (PF1)                                                                                                          | International importance        | Yes  |
| Wet willow-alder-ash woodland (WN6)                                                                                              | International importance        | Yes  |
| <b>Fauna Species</b>                                                                                                             |                                 |      |
| Bats                                                                                                                             | County importance               | Yes  |
| Badgers                                                                                                                          | Local importance (higher value) | Yes  |
| Otter                                                                                                                            | County importance               | Yes  |
| Other mammals protected under the Wildlife Acts (Irish stoat, hedgehog and pygmy shrew)                                          | Local importance (higher value) | Yes  |
| Other mammals not protected under the Wildlife Acts (fox, fallow deer, rabbit, wood mouse, house mouse, brown rat)               | Local importance (lower value)  | No   |
| Breeding birds                                                                                                                   | National importance             | Yes  |
| Wintering birds                                                                                                                  | National importance             | Yes  |
| White-clawed crayfish                                                                                                            | County importance               | Yes  |
| Molluscs (including Narrow-mouthed whorl snail <i>Vertigo angustior</i> and Desmoulin's whorl snail <i>Vertigo moulinsiana</i> ) | see Rye Water Valley/Carton SAC | Yes  |

## 6.4 PREDICTED EFFECTS

As per the relevant guidelines, likely significant effects have only been assessed for KERs, as listed in Table 6.15. An effect is considered to be ecologically significant if it is predicted to affect the integrity or conservation status of a KER at a specified geographical scale. All effects are described in the absence of mitigation.

### 6.4.1 CONSTRUCTION PHASE

The proposed construction phase impacts from the OHL realignment (including decommissioning) has been assessed below. As outlined within the Outline CEMP accompanying this application, the proposed decommissioning of the existing towers does not require physical overlap of the SAC or sensitive habitat areas, rather the conductors will be winched onto drums remotely. All tower locations to be removed, with the exception of Tower 7 are located within existing, hard standing car park areas of the Intel complex and Lidl. Therefore, there are no additional impacts associated with the decommissioning works above those described below.

#### 6.4.1.1 Construction Phase impacts on designated sites

This section describes and assesses the potential for the proposed development to result in likely significant effects on designated areas for nature conservation at SACs, SPAs, NHAs or pNHAs. In the context of European sites this is focussed on the habitats and species for which the sites are selected (QIs for SACs and SCIs for SPAs) and the conservation objectives supporting their conservation status in each site. This assessment is directly related to the assessment methodology for European sites required under the Habitats Directive, which is presented in the Appropriate Assessment Screening Report prepared for the proposed development.

In the case of NHAs and pNHAs the assessment considers whether the integrity of any such site would be affected by the proposed Strategic Housing Development with reference to the ecological features for which the site is designated or is proposed.

#### 6.4.1.2 European Sites

##### Rye Water Valley / Carton SAC

As outlined within the NIS accompanying this application, the proposed development has the potential to affect the conservation objectives, and therefore the integrity, of the Rye Water Valley/Carlton SAC because of:

- the risk that an accidental pollution event during construction could affect groundwater quality within the SAC; and,
- the risk that an accidental pollution event during construction could affect the surface water quality within the SAC.

Affecting the integrity of the Rye Water Valley/Carlton SAC would result in a likely significant effect at the international geographic scale.

##### North Dublin Bay SAC, South Dublin Bay SAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA

The proposed development site drains to the Rye Water. Therefore, the proposed development has the potential to affect water quality in the Rye Water and downstream in the River Liffey and Dublin Bay. A pollution event, of a sufficient magnitude, has the potential to affect the receiving aquatic and marine environments (either alone or in combination with other pressures on water quality) to an extent that undermines the conservation objectives of the European sites downstream in Dublin Bay, and therefore, adversely affect the integrity of those European site: North Dublin Bay SAC, South Dublin Bay SAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA.

Affecting the integrity of the North Dublin Bay SAC, South Dublin Bay SAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA would result in a likely significant effect at the international geographic scale.

#### **6.4.1.3 National Sites**

##### Rye Water Valley/Cartron pNHA

In the vicinity of the proposed development site, the boundary of the Rye Water Valley/Cartron pNHA is largely contiguous with the boundary of the Rye Water Valley/Cartron SAC. As outlined in section 6.3.1.1 the proposed development crosses the pNHA boundary at one location (see Figure 6.9).

The potential impacts of the proposed development on the Rye Water Valley/Cartron pNHA are as outlined above for the Rye Water Valley/Cartron SAC: an accidental pollution event during construction affecting surface water or groundwater quality.

These potential impacts could affect habitat and species, and therefore, the integrity of the Rye Water Valley/Cartron pNHA which would result in a likely significant effect at the national geographic scale.

##### Liffey Valley pNHA, Dolphins, Dublin Docks pNHA, North Dublin Bay pNHA, South Dublin Bay pNHA

The potential impacts of the proposed development on these pNHA sites are as described for the SAC and SPA sites downstream in Dublin Bay:

- An accidental pollution event during construction of a sufficient magnitude, could potentially negatively affect water quality in the Rye Water, the River Liffey and in Dublin Bay.

A pollution event, of a sufficient magnitude, has the potential to affect the receiving aquatic and marine environments (either alone or cumulatively with other pressures on water quality) to an extent that has long-term effects on the ecological environment supporting the diverse range of habitats and species found within the pNHA sites along the Liffey Valley and in Dublin Bay: Liffey Valley pNHA, Dolphins, Dublin Docks pNHA, North Dublin Bay pNHA, South Dublin Bay pNHA.

Affecting the integrity of the Liffey Valley pNHA, Dolphins, Dublin Docks pNHA, North Dublin Bay pNHA, South Dublin Bay pNHA would result in a likely significant effect at the national geographic scale.

#### **6.4.1.4 Construction Phase impacts on habitats**

##### **6.4.1.5 Habitat loss**

There will permanent loss of small areas of dry calcareous and neutral grassland, scrub, recolonising bare ground and dry meadows and grassy verges habitat associated with the construction of the proposed towers and associated foundations. However, given the size of the proposed tower foundations, these areas of habitat loss will be minor. Additionally, as outlined within the Outline CEMP, following construction of the proposed towers, lands will be reinstated with topsoil and vegetation which will minimise the impact of those effects on habitats over the short to medium-term. Therefore, the loss of these habitat is not likely to result in a significant negative effect, at any geographic scale.

There will also be a loss of sections of mixed broadleaf woodland, oak-ash-hazel woodland and broadleaf/conifer woodland habitat as a result of vegetation clearance/ tree topping during construction and operation. As outlined on the Tree Survey Report prepared by Independent Tree Services, vegetation clearance will involve a combination of crowning/topping, coppicing, pruning and height reduction rather than complete removal. However, the loss/ alterations of these habitats will be permanent and has the potential to result in a likely significant negative effect, at a local to county geographic scale (depending on the habitat being impacted upon).

##### **6.4.1.6 Habitat degradation as a result of hydrological and hydrogeological impacts**

An accidental pollution event or increased sediments loading in run-off during construction of the proposed development, of a sufficient magnitude, has the potential to affect the receiving ground water and surface water environment and downstream marine environments (either alone or in combination with other pressures on water quality) to an extent that could result in adverse effects habitats, especially those

associated the Rye Water Valley/Carton SAC or European sites downstream in Dublin Bay: North Dublin Bay SAC, South Dublin Bay SAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA. During construction of the proposed development, there is a risk of accidental pollution incidences from the following sources:

- Suspended solids (muddy water with increase turbidity) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.

Qualifying interest priority Annex I petrifying spring habitat associated with the Rye Water Valley/Carton SAC is characterised by the formation of tufa, an alkaline substrate formed in limestone rich environments. Pollution of the Rye Water or local groundwater body as a result of an accidental spillage or contaminated surface water run-off could erode tufa deposits, and affect the bryophyte assemblages present within the Rye Water Valley/Carton SAC. Impacts associated with an accidental spillage or contaminated surface water run-off could result in an overall reduction in flora diversity. Impacts could extend farther downstream to Dublin Bay (North Dublin Bay SAC, South Dublin Bay SAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA) and include an overall reduction in flora diversity.

Therefore, in the absence of mitigation, potential surface and ground water quality impacts arising from the proposed development, including decommissioning could result in a likely significant effect on habits at a local to international geographical scale, albeit over a temporary scale during construction.

#### 6.4.1.7 Damage to retained vegetation

In the absence of any mitigation, there is potential for damage to areas of treelines, scrub and woodland not proposed for removal. While areas of these habitats are being retained as part of the proposed development, there remains a risk of damage to the habitats arising during construction such as driving vehicles and storing materials within tree root protection zones, or through accidental machinery strikes to branches or trunks of trees. This impact, in a worst-case scenario could result in damage and degradation of trees, and ultimately death of individual trees. At a worst case scenario, this impact would be significant at an international geographic scale and the duration of impact would be long-term.

#### 6.4.1.8 Construction Phase impacts on Fauna

##### 6.4.1.9 Badger

##### Habitat loss

Although no setts or signs or badger were recorded at any of the proposed tower locations, badgers are likely to utilise the proposed development site for commuting and foraging. Construction of the towers will result in the permanent loss of small areas of badger foraging habitat within the proposed development site, and badgers may temporarily be displaced from the immediate vicinity of the towers during the construction phase of the proposed development. The area of habitat that will be lost at each tower is very small (through displacement during construction, and permanently arising from the installation of infrastructure), equivalent to the footprint of the towers. In the context of badger territories which range between 25ha and 200ha<sup>34</sup>, the loss of habitat is not significant, as the reduction in foraging resource is not likely to negatively affect the rate of survival or condition of local badger populations.

##### Disturbance/ displacement

Increased human presence and/or noise and vibration during construction, has the potential to displace badgers from foraging habitat. However, considering the short-term nature of the construction works (c. 9 months) and that the majority of human disturbance/noise will typically be undertaken during normal daylight hours and badgers are nocturnal in habit, significant displacement of badgers from foraging areas is unlikely to affect the local badger population.

There is a known active badger sett within the hedgerow running north to south between the proposed development site and the Royal Canal. There is potential for construction work and use of heavy machinery to result in death or injury to badgers within setts, as well as the destruction of setts. This has the potential to result in a likely significant negative effect, at a local geographic scale.

#### 6.4.1.10 Otter

##### Habitat loss

No works are proposed within any watercourses and there will be no loss of aquatic or suitable riparian/terrestrial foraging habitat due to the proposed development including decommissioning. Therefore, the proposed development will not result in a significant negative effect, with regard habitat loss for otter, at any geographic scale.

##### Disturbance/ displacement

The noise, vibration, increased human presence and the visual deterrent of construction traffic associated with site clearance and construction theoretically has the potential to disturb and displace otters from habitat areas adjacent to the proposed development site. For mammal species such as otter, disturbance effects would not be expected to extend beyond 200m<sup>35</sup>-250m<sup>18</sup>. With respect to the proposed development, two towers are located within 250m of an otter couch site (an above ground resting place for otter, typically used as a feeding location):

- A tower on the north bank of the Rye Water is c. 110m from an otter couch site; and,
- A tower on the south bank of the Rye Water is c. 150m from an otter couch site.

Notwithstanding the proximity of towers to the couch site, the existing vegetation comprising woodland on the south bank and treelines on the north bank, will shield the couch site from construction work and activities. The work footprint does not extend to the immediate vicinity (e.g. within 30m of) the couch site and it is not anticipated that footfall from construction personnel will significantly increase in proximity to the couch site for this reason. Otter are likely to be somewhat habituated to human presence along the Rye Water, and the species occurs in urban environments including Dublin City Centre<sup>36</sup>. Finally, otter are largely crepuscular in nature, e.g. they are most active at dawn and dusk, meaning they are less active during peak periods of human activity. For these reasons, there is no possibility of significant disturbance/displacement impacts on otter arising from the proposed development either during its construction or operation.

With respect to the strict protection afforded to otters by way of Regulation 51 of the Birds and Habitats Regulations, the need for a derogation licence under Section 54 of the regulations is not triggered in this instance as the proposed development will not result in disturbance as it is defined in relation to the Habitats Directive within *Guidance Document on the Strict Protection of Animal Species of Community Interest under the Habitats Directive*<sup>37</sup>: "any activity that deliberately disturbs a species to the extent that it may affect its chances of survival, breeding success or reproductive ability, or leads to a reduction in the occupied area or the relocation or displacement of the species". In the context of the proposed development, otter are anticipated to continue utilising their territory along the Rye Water and the proposed works will not affect the breeding success or reproductive ability of the species, and therefore cannot affect the chances of survival of the species in the locality.

##### Effects of water quality impacts

In the absence of specific mitigation measures, there is potential for the proposed development to affect water quality in the Rye Water, the River Liffey and downstream in Dublin Bay which could affect otter in those sites through direct pollution or through a reduction in prey availability. This has the potential to result in a likely significant negative effect, at a county geographic scale.

<sup>18</sup> This is consistent with Transport Infrastructure Ireland (TII) guidance (*Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* and *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes*) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by existing surrounding vegetation and buildings, with the actual ZoI of construction related disturbance likely to be much less in reality.

#### 6.4.1.11 Other small mammals

##### Habitat loss

The majority of the proposed development site consists of rank grassland, scrub and woodlands with potentially suitable habitat to support small mammal species, such as Pygmy shrew or Hedgehog. Given the relatively low numbers of individuals of each species that are likely to be affected, and that they are highly mobile species, site clearance is unlikely to result in a level of mortality that would affect the species' conservation status, and result in a significant negative effect, even at a local geographic scale.

##### Disturbance/displacement

In conjunction with any displacement effects associated with habitat loss, increased human presence and/or noise and vibration associated with construction works, has the potential to displace mammal species from both breeding/resting places and from foraging habitat. However, considering that disturbance will be short-term (c. 6 - 8 months), it is extremely unlikely to result in any long-term effects on the local mammal population or their conservation status. Therefore, disturbance/displacement is unlikely to result in a significant negative effect, at any geographic scale.

#### 6.4.1.12 Bats

##### Direct mortality

Bats, and their breeding and resting places, are strictly protected under the Birds and Habitats Regulations, and under the Wildlife Acts, and it is an offence under that legislation to intentionally kill or injure bats or to interfere with or destroy their breeding or resting places. However, no suitable roosting features were identified within the proposed development site including any areas of vegetation marked for clearance. Therefore, the proposed development will not result in a significant negative effect, arising from direct mortality, at any geographic scale.

##### Habitat loss

No suitable roosting habitat was identified within the proposed development site, and therefore there is no possibility of significant effects arising from the loss of roosting habitat.

The loss of woodland and treeline habitat will result in the permanent loss of foraging habitat for bat species within the proposed development site. However, given the relatively small scale of vegetation clearance required and the availability of alternative suitable foraging habitat located in the immediate surrounding environment, all of which are likely to be sufficient to maintain the local population in the long-term.

It is therefore predicted that, despite any temporary effects, the loss of foraging/commuting habitat associated with the proposed development is unlikely to affect the conservation status of the local bat population and will not result in a likely significant negative effect, at any geographic scale, especially considering that the most frequently recorded species (common pipistrelle, soprano pipistrelle and Leisler's bat) are known to have a widespread distribution across the region, and in Ireland (Roche *et al.*, 2014) and that these species are showing an increase in their population trend.

##### Disturbance/ displacement

Light levels are not anticipated to increase significantly during the construction phase of the proposal, as works will be largely confined to daylight hours, and therefore there will not be a requirement for long-term lighting of the proposed development site which could affect suitable bat foraging habitat in the vicinity. However, it is possible that temporary lighting required during the construction stage of the proposed development may illuminate previously unlit feeding and/or commuting areas, making them unsuitable for bats. However, any effects associated with artificial lighting during construction of the proposed development, are likely to be temporary and confined to specific areas within the site. Additionally, the most common species recorded within the subject lands i.e. Leisler's bat, soprano pipistrelle and common pipistrelle bat are some of the least sensitive species to artificial light spill. For these reasons, disturbance / displacement impacts during construction will not be significant at any geographic scale.

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28 NOV 2022 77

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#### **6.4.1.13 Breeding and Wintering birds**

##### Habitat loss

Woodland, grassland and scrub habitats within the site support the majority of birds recorded. Vegetation clearance to facilitate construction will remove sections of these habitats from within the proposed development site. Overall, breeding and wintering birds have been evaluated as national importance, given the presence of Annex I bird species including golden plover and kingfisher within the wider survey area. However, the loss of woodland, grassland and scrub habitat will result in the permanent loss of foraging/nesting habitat for bird species within the proposed development site. Given the relatively small scale of vegetation clearance required relative to the total local resource and the availability of alternative suitable habitat located in the immediate surrounding environment, all of which are likely to be sufficient to maintain the local population in the long-term.

Additionally, as outlined within the Outline CEMP, following construction of the proposed towers, lands will be reinstated with topsoil and vegetation and vegetation clearance will involve a combination of crowning/topping, coppicing, pruning and height reduction rather than complete removal in most cases.

It is therefore predicted that, despite any temporary effects, the loss of foraging/nesting habitat associated with the proposed development is unlikely to affect the conservation status of the local bird populations and will not result in a likely significant negative effect, at any geographic scale.

##### Direct mortality

If site clearance works were to be undertaken during the bird breeding season (March to August, inclusive) it is likely that nesting sites holding eggs or chicks will be destroyed and birds killed. Mortality of birds at the scale of the proposed development, over what is likely to be a single breeding bird season in terms of completing site clearance works, is likely to have a short-term effect on local bird population abundance. However, the direct mortality of breeding birds has the potential to result in a likely significant negative effect, at the local to national geographic scale, depending on the species impacted upon.

##### Disturbance/ displacement

The noise, vibration, increased human presence and the visual deterrent of construction traffic associated with site clearance and construction will disturb breeding and wintering bird species and is likely to displace birds from habitat areas adjacent to the proposed development boundary. Although it is not possible to quantify the magnitude of this potential impact (or the potential effect zone) it could potentially extend for several hundred metres from the proposed development. Given the short-term nature of the construction works (c. 9 months), disturbance or displacement effects will also be over the short-term and are therefore not likely to affect the conservation status of the local bird populations.

##### Effects of water quality impacts

There is also, in the absence of specific mitigation measures, the potential for the proposed development to affect water quality in the Rye Water, the River Liffey and downstream in Dublin Bay which could affect birds in those sites; particularly species such as the kingfisher that depend on the aquatic environment for food. This has the potential to result in long-term effects on bird populations downstream and has the potential to result in a likely significant negative effect, at a national geographic scale (outside of the designated sites for nature conservation).

#### **6.4.1.14 Molluscs**

##### Effects of water quality impacts

An accidental surface or ground water pollution event during construction, of a sufficient magnitude, has the potential to affect water quality in the Rye Water and adjacent Rye Water Valley/Carton SAC, either alone or cumulatively with other pressures on water quality within the vicinity.

This could have long-term effects on the fen and marsh habitats within the Rye Water Valley/Carton SAC at Louisa Bridge, which support the qualifying interest narrow-mouthed whorl snail and Desmoulin's whorl snail populations and has the potential to result in a likely significant effect, at the international geographic scale.

### 6.4.1.15 White-clawed Crayfish

#### Habitat loss

No works are proposed within any watercourses and there will be no loss of aquatic / suitable habitat due to the proposed development. Therefore, the proposed development will not result in a significant negative effect, with regard habitat loss for crayfish, at any geographic scale.

#### Effects of water quality impacts

An accidental pollution event during construction, of a sufficient magnitude, has the potential to affect water quality in the Rye Water and the River Liffey downstream, either alone or cumulatively with other pressures on water quality within the catchments. This could have long-term effects on the quality of the receiving river systems and the populations of white-clawed crayfish species they support and has the potential to result in a likely significant effect, at the county geographic scale.

## 6.4.2 OPERATIONAL PHASE

### 6.4.2.1 Operational Phase impacts on designated sites

As outlined within Chapter 7 and Chapter 8 of this EIAR, there will be a minimal decrease in recharge area associated with the tower foundations surface area. Once these are installed into the overburden, there could be a minimal cut of the shallow horizontal recharge/ groundwater flow. However, this will not affect the regional water table within bedrock or the hydrological/ hydrogeological regime of the water environmental receptors (Rye Water SAC and Leixlip Spa). This will have a minor effect on local recharge to ground; however, the impact on the overall hydrological regime will be imperceptible.

In light of the above and considering the nature and location of the proposed development, no operational phase impacts are predicted on any European or Nationally designated sites including:

- Rye Water Valley/Carlton SAC;
- North Dublin Bay SAC;
- South Dublin Bay SAC;
- North Bull Island SPA;
- South Dublin Bay and River Tolka Estuary SPA
- Rye Water Valley/Carlton pNHA;
- Liffey Valley pNHA;
- Dolphins, Dublin Docks pNHA;
- North Dublin Bay pNHA; and,
- South Dublin Bay pNHA

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28 NOV 2022

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### 6.4.2.2 Operational Phase impacts on habitats

#### 6.4.2.3 Habitat loss

Ongoing vegetation trimming will be required as part of the regular maintenance of the proposed development. This trimming will be carried out to ensure that flashover(s) to timber do not occur when OHL conductors are moved by wind, and that falling trees cannot come into contact with any part of the transmission line.

While it is unknown at this stage when or where this vegetation trimming will be required if works are undertaken within oak-ash-hazel woodland or wet willow-alder-ash woodland identified within the proposed development site, this has the potential to result in long-term effects on habitats and has the potential to result in a likely significant negative effect, at the county to international geographic scale (depending on the habitat impacted).

#### 6.4.2.4 Damage to retained vegetation

During this on-going vegetation trimming described above, there is potential for damage to areas of treelines, scrub and woodland not proposed for removal. There is a risk of damage to habitats arising during works such as driving vehicles and storing materials within tree root protection zones, or through accidental machinery

strikes to branches or trunks of trees. This impact, in a worst-case scenario could result in damage and degradation of trees, and ultimately death of individual trees. At a worst-case scenario, this impact would be significant at an international geographic scale and the duration of impact would be long-term.

#### **6.4.2.5 Operational Phase impacts on fauna**

##### **6.4.2.6 Badger**

There is a known active badger sett within the hedgerow running north to south between the proposed development site and the Royal Canal. There is potential for operation vegetation clearance works and use of heavy machinery to result in death or injury to badgers within setts, as well as the destruction of setts. This has the potential to result in a likely significant negative effect, at a local geographic scale.

##### **6.4.2.7 Otter**

Given the nature and location, no operational phase impacts are predicted on otter as a result of the proposed development.

##### **6.4.2.8 Other small mammals**

Given the nature and location, no operational phase impacts are predicted on other small mammals as a result of the proposed development.

##### **6.4.2.9 Bats**

###### Direct mortality through collisions and electrocution with overhead wires

There is very little literature available on the effects of overhead line infrastructure on bat species with the majority of published information on bat collisions with manmade structures pertaining to wind turbines. However, many bat deaths associated with wind turbines are as a result of barotrauma rather than direct collision. Recent studies, investigating the cause of bat collisions with buildings<sup>38</sup> found that building material is an important factor to be considered and that smooth vertical surfaces such as glassy exteriors and windows can be problematic, none of which are present on the proposed development. Irish bat species navigate largely by echolocation calls, and fixed structures such as those proposed as part of the proposed development present a low risk in terms of collision.

Electrocution caused by interaction with electricity transmission infrastructure is not possible for Irish bat fauna. Avian electrocution occurs when a bird is able to bridge any two energized conductors (Janss, 2000). The shortest phase to phase conductor spacing in Ireland for 110 kV in the field is generally 4.5m (EirGrid, 2012). Leisler's bat, the largest species in Ireland, has a wingspan of just 26-34 cm (Altringham, 2003) thus making electrocution impossible.

Therefore, direct mortality to bat species through collision or electrocution is unlikely to result in a significant negative effect, at any geographic scale

###### Direct mortality as a result of vegetation clearance

Although no suitable roosting features were identified within the proposed development site including any areas of vegetation marked for clearance there is potential that this could change overtime and new PRFs become established within the proposed development site. As such, there is the potential for bats roosting in this structure or trees to be injured or killed during on-going maintenance and tree trimming works associated with the operation of the proposed development.

##### **6.4.2.10 Breeding and wintering birds**

###### Direct mortality through collisions and electrocution with overhead wires

Collision with overhead lines (specifically the earth wire or conductors) is the main potential threat posed by transmission lines to birds in Ireland. However, collisions with transmission lines are considered to be

relatively rare events (Eirgrid, 2020)<sup>39</sup>. Most studies conclude that mortality from collisions is unlikely to affect bird populations except, where rare or protected species occur, impacts could be significant (EirGrid EBES, 2016b6).

The literature suggests that herons, swans, geese, raptors (including owls), gamebirds (grouse and pheasants), waders, rails, crakes and some passerines should be considered as susceptible to collisions with power lines (Eirgrid, 2020). A number of the above species were recorded within the wider Intel lands during the dedicated breeding and wintering bird surveys.

Landscape features such as valleys, rivers or shorelines may concentrate birds into relatively narrow flight paths, and preferably new power lines should be routed parallel rather than perpendicular to such features. Although the proposed development crosses the Rye water perpendicularly at one point (Figure 6.1) the majority of the route runs parallel to the Royal Canal, an area where the majority of higher risk species (e.g., mallard, swan and heron) were recorded.

However, given the risk posed by overhead line infrastructure, the location of the proposed development relevant to the Rye Water and Royal Canal and the presence of susceptible species within the wider Intel lands the risk posed the direct mortality of breeding birds as a result of collision with overhead lines has the potential to result in a likely significant negative effect, at the local to national geographic scale, depending on the species impacted upon.

Electrocution of birds occurs when they make simultaneous contact with the energised and grounded sections of a power line, or between two phase conductors. The risk of electrocution of birds is considered to be low on electricity transmission structures in Ireland because of the design of poles and pylons and the wide spacing and arrangement of conductors. Conductor spacing for 110 kV lines is typically 4.5m, which is almost double the wingspan of the largest Irish bird species such as Mute Swan and White-tailed Eagle. In addition, the design of structures is such that contact between conducting wires and grounded components is not possible (EirGrid, 2012). Studies worldwide indicate that it is only on lower voltage distribution lines that conducting wires and/or earthed components are placed sufficiently closely for even larger birds to touch two wires simultaneously, and larger bird species are most at risk of electrocution because they are most likely to bridge the gap between conducting wires.

Therefore, direct mortality to bird species through collision or electrocution is unlikely to result in a significant negative effect, at any geographic scale

#### Direct mortality as a result of vegetation clearance

If on-going vegetation trimming works were to be undertaken during the bird breeding season (March to August, inclusive) it is likely that nesting sites holding eggs or chicks will be destroyed and birds killed. Mortality of birds at the scale of the proposed vegetation clearance works, is likely to have a short-term effect on local bird populations. However, the direct mortality of breeding birds has the potential to result in a likely significant negative effect, at the local to national geographic scale, depending on the species impacted upon.

#### **6.4.2.11 Molluscs**

Given the nature and location, no operational phase impacts are predicted on mollusc species including *Vertigo moulinsiana* and *Vertigo angustior* as a result of the proposed development.

#### **6.4.2.12 White-clawed crayfish**

Given the nature and location, no operational phase impacts are predicted on white-clawed crayfish as a result of the proposed development.

## **6.5 MITIGATION AND MONITORING MEASURES**

Mitigation measures are discussed only for KERs where a potential significant effect has been identified. All measures described below will be implemented in full and included in the Outline CEMP to accompany the planning submission. The CEMP is a live document that will be updated by the appointed contractor.

## 6.5.1 CONSTRUCTION PHASE

### 6.5.1.1 Measures to protect water quality during construction

In advance of work starting on site, the works Contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The detailed CEMP will set out the overarching vision of how the construction of the proposed development will be managed in a safe and organised manner by the Contractor. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent planning conditions relevant to the proposed development.

As a minimum, the CEMP will be formulated in accordance with best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532) Construction Industry Research and Information Association;
- CIRIA (2002) Control of water pollution from construction sites: guidance for consultants and contractors (SPI56) Construction Industry Research and Information Association
- CIRIA (2005), Environmental Good Practice on Site (C650); Construction Industry Research and Information Association
- BPGCS005, Oil Storage Guidelines;
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- CIRIA 697, The SUDS Manual, 2007; and
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.

In order to reduce impacts on the soils and geology environment, a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:

- Control of soil excavation/ infill and export from site;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

#### Control of Soil Excavation

- Site preparation, clearance, levelling, construction of foundations, and access roads will require the excavation c. 2,060m<sup>3</sup> of soil. All topsoil excavated in the construction of tower foundations will be reinstated where possible, on completion of the proposed works. Where practical and appropriate, excavated subsoil will be used for associated construction and landscaping purposes.
- According to onsite investigations, the bedrock vulnerability varies from 'Low' to 'Extreme' (T6) along the projected line throughout the site. Removal and reinstatement of subsoil cover will not alter the vulnerability category of the underlying bedrock. The deposition of compacted soil would increase the overburden thickness and thus may even decrease the groundwater vulnerability.
- Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any open surface water drains. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust. The tower foundations will be backfilled one leg at a time with the excavated material. The backfill is placed and compacted in layers. When the base construction crew leave the site, they will ensure the removal of all surplus materials from the site, including all unused excavated fill.
- Measures to minimise the suspension and mobilisation of sediment downstream of the working area should consider silt barriers and coffer damming to create dry working areas.
- To avoid excessive silt runoff, site clearance is not to be undertaken during wet conditions, when rainfall of more than 0.5 mm/hour is forecast within the next 24 hours or rainfall of more than 3mm/hour is forecast within the next five days in the Leixlip area. At the riverbank works locations, silt fencing will be installed along the river bank to retain eroded sediments. Catch nets may be used where relevant.
- Soil cleared from the site and all materials associated with the building process are to be stored outside the flood zone in designated storage areas. The flood zone will be delineated on the works areas. No

soil storing will be allowed within 30 m of the open water, which is in line with the Inland Fisheries Ireland guidelines

- Although there is no evidence of historical contamination in the proposed development site, all excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be disposed of by a licensed waste disposal contractor.
- Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated against through the implementation of appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the boundary of the site and there will be no direct link or pathway from this area to any surface water body. Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible.
- Dust suppression measures (e.g., damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads.

#### Fuel and Chemical Handling

- The construction material storage yard is proposed to be located in the existing southern car parks within Intel's compound, between towers T1-T2 and T2-T3.
- Wash-out of concrete trucks will not occur at the proposed development site, instead wash-out will be undertaken at the supplier washout facility. The location for the washout facilities is in Kilsaran, Adamstown, Lucan, Dublin and Roadstone which is located at Roadstone retail belgard, Tallaght, Dublin.
- All chemicals and fuels will be stored properly in identified areas within the construction compound. No batching of wet-cement products will occur on site. Ready-mixed concrete will be delivered to the excavation site. Wash-down of concrete contaminated equipment will not take place within the site.
- To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Refuelling areas are to be identified in the CEMP prepared by the construction contractor. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.
- In the case of drummed fuel or other chemicals which may be used during construction, containers should be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.
- Emergency response procedures will be outlined in the detailed CEMP. All personnel working on the site will be suitably trained in the implementation of the procedures.
- All vehicles should be regularly checked for oil leaks, and ruptured hose pipes.

#### Control of Water during Construction

- Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the work areas which limits the potential for any offsite impacts.
- Any minor ingress of groundwater and collected rainfall in the excavation will be pumped out during construction.
- There shall not be discharge of silty water from the works to any watercourse, should any discharge of construction water be required during the construction phase, discharge will be to foul sewer following agreement with Kildare CC/ Irish Water.
- There will be no discharge of effluent to groundwater during the construction phase. All wastewater from the construction facilities will be stored for removal off site for disposal and treatment.

- All works in the SAC or adjacent to it will comply with current best practice, notable the Inland Fisheries Ireland Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016) and Transport Infrastructure Ireland's Guidelines for the crossing of watercourses during the construction of national road schemes (TII, 2008).
- The contractor shall be obliged to ensure no deleterious discharges are released from the sites to the River Rye Water during excavation, de-watering, or erecting activities. Throughout the period of works the contractor shall also take account of relevant legislation and best practice guidance including but not limited to the following:
  - C532 Control of water pollution from construction sites: guidance for consultants and contractors;
  - C648 Control of water pollution from linear construction projects;
  - SP156 Control of water pollution from construction sites – guide to good practice;
  - NRA's 'Guidelines for the Crossing of Watercourses during Construction of National Road Schemes (NRA, 2005);
  - The Eastern Regional Fisheries Board guidance document 'Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites' (Murphy, 2004); and
  - The Southern Regional Fisheries Board guidance document 'Maintenance and protection of the inland fisheries resource during road construction and improvement works' (Kilfeather, 2007).
- In order to minimise the risk of contamination, any stockpiled material designated for removal will be removed off-site as soon as possible. Surface water drain gratings in areas near or close to where stockpiles are located will be covered by appropriate durable polyurethane covers or similar. Active treatment systems such as siltbusters or similar may will be adopted, depending on turbidity levels and discharge limits.

In addition to the above measures, the following controls will be used to avoid release of cement leachate from the site:

- No batching of wet-cement products will occur on site;
- Ready-mixed concrete will be delivered to the excavation site. Where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements will be used;
- Shuttering and formwork shall be checked for gaps by the ECoW in advance of pouring. Where necessary, polyurethane foam may be used to seal shuttering joints to prevent concrete leaking.
- Wash-down of concrete contaminated equipment will not take place within the site.
- Concrete trucks will be brought as close as possible to the excavation to pour directly into the excavation. If this is not possible, concrete will be transported in dumpers fitted with concrete chutes;
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed;
- Weather forecasting will be used to plan dry days for pouring concrete;
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event;
- The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a concrete washout area.

#### 6.5.1.2 Measures to protect habitats during construction

Measures outlined within Section 6.5.1.1 of this report are sufficient to reduce the potential effects of surface and ground water quality impacts on habitats downstream and adjacent to the proposed development site to levels that are not significant at any geographic scale.

Any vegetation (including trees or woodlands) adjacent to, or within, the proposed development which is to be retained will be afforded adequate protection during the construction phase in accordance with the Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post Construction of National Road Schemes (National Roads Authority, 2006b), as follows:

- All trees within and adjacent to the proposed development site that are to be retained, will be fenced off at the outset of works and for the duration of construction to avoid structural damage to the trunk, branches or root systems of the trees as per the requirements of the British Standard Institution (BSI) British Standard (BS) 5837:2012 Trees in relation to in relation to design, demolition and construction

- Recommendation . Temporary fencing will be erected at a sufficient distance from the tree so as to enclose the Root Protection Area (RPA) of the tree. The RPA will be defined based upon the recommendation of a qualified arborist;
- Where fencing is not feasible due to insufficient space, protection for the tree/hedgerow will be afforded by wrapping hessian sacking (or suitable equivalent) around the trunk of the tree and strapping stout buffer timbers around it
- The area within the RPA will not be used for vehicle parking or the storage of materials (including soils, oils and chemicals). The storage of hazardous materials (e.g. hydrocarbons) or concrete washout areas will not be undertaken within 10 m of any retained trees, hedgerows and treelines
- A qualified arborist will assess the condition of, and advise on any repair works necessary to, any trees which are to be retained or that lie outside of the proposed development boundary but whose RPA is impacted by the works. Any remedial works required will be carried out by a qualified arborist
- A buffer zone of at least 5m will be maintained between construction works and retained hedgerows to ensure that the root protection areas are not damaged

#### **6.5.1.3 Measures to protect breeding birds during construction**

Vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1st of March and the 31st of August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within three days of the nest survey. Where the vegetation is not cleared within three days of checks, a repeat check will be required. Should nesting birds be encountered during surveys, the removal of vegetation will be required to be delayed until after the nesting has finished.

Measures outlined within Section 6.5.1.1 of this report are sufficient to reduce the potential effects of water quality impacts on downstream breeding and wintering bird species, particularly species such as the kingfisher that depend on the aquatic environment for food to levels that are not significant at any geographic scale.

#### **6.5.1.4 Measures to protect badger during construction**

As the usage of the proposed development site by badgers can change over time, a confirmatory pre-construction check of the proposed development site, especially the proposed tower locations for new burrow entrances will be carried out immediately prior to construction works commencing to confirm their usage by badger.

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Planning Department

28 NOV 2022

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The existing badger setts as well as any new badger setts identified during the survey outlined above will be afforded protection in line with the requirements set out in the NRA (2005) guidance document as follows:

- Badger setts if encountered will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage
- In the season June to November, no heavy machinery will be used within 30m of badger setts; lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances
- During the breeding season (December to June inclusive), none of the above works will be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts
- Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of an ecologist with experience of badger mitigation.

#### **6.5.1.5 Measures to protect otter during construction**

Measures outlined within Section 6.5.1.1 of this report are sufficient to reduce the potential effects of water quality impacts on aquatic fauna including otter to levels that are not significant at any geographic scale.

#### **6.5.1.6 Measures to protect molluscs during construction**

Measures outlined within Section 6.5.1.1 of this report are sufficient to reduce the potential effects of surface and ground water quality impacts on local fauna including *Vertigo moulinsiana* and *Vertigo angustior* to levels that are not significant at any geographic scale.

#### **6.5.1.7 Measures to protect crayfish during construction**

Measures outlined within Section 6.5.1.1 of this report are sufficient to reduce the potential effects of water quality impacts on aquatic fauna including white-clawed crayfish to levels that are not significant at any geographic scale.

### **6.5.2 OPERATIONAL PHASE**

No operational phase impacts are predicted with regard surface and ground water, designated sites, badger, otter, other small mammals, molluscs or crayfish as a result of the proposed development and thus no operational mitigation is required.

#### **6.5.2.1 Measures to protect habitats during operation**

Prior to the commencement of any works a suitably qualified ecologist will be appointed to review the trimming requirements. Where works are to be undertaken within habitats identified as county importance or higher e.g. oak-ash-hazel woodland (WN2) or wet willow-alder-ash woodland (WN6), this should be reviewed by the project ecologist at the time.

Works within these locations will only involve topping or crown reduction if this is confirmed to be necessary to achieve the desired safety clearance.

No heavy machinery is to be used within the boundary of the SAC or areas identified as internationally important habitat as per Figure 6.11.

### 6.5.2.2 Measures to protect badger during operation

The existing badger setts as well as any new badger setts identified during the survey outlined above will be afforded protection in line with the requirements set out in the NRA (2005) guidance document as follows:

- Badger setts if encountered will be clearly marked and the extent of bounds prohibited for vehicles clearly marked by fencing and signage
- In the season June to November, no heavy machinery will be used within 30m of badger setts; lighter machinery (generally wheeled vehicles) will not be used within 20m of a sett entrance; light work, such as digging by hand or scrub clearance will not take place within 10m of sett entrances
- During the breeding season (December to June inclusive), none of the above works will be undertaken within 50m of active setts, nor blasting or pile driving within 150m of active setts
- Works can be undertaken within these zones following consultation with, the approval of and, if required, under the supervision of an ecologist with experience of badger mitigation.

### 6.5.2.3 Measures to protect bats during operation

Although no suitable roosting features were identified within the proposed development site including any areas of vegetation marked for clearance there is potential that this could change overtime and new PRFs become established within the proposed development site. Therefore, a suitably qualified bat ecologist, licenced as necessary, will undertake a confirmatory check prior to any vegetation trimming to assess the suitability of trees marked for trimming to host roosting bats. A derogation licence may need to be sought from NPWS in order to permit removal of bats and mitigate for the loss/destruction of any roosts on the site, should PRFs be identified.

### 6.5.2.4 Measures to protect birds during operation

Vegetation (e.g. hedgerows, trees, scrub and grassland) will not be removed, between the 1st of March and the 31st of August, to avoid direct impacts on nesting birds. Where the construction programme does not allow this seasonal restriction to be observed, then these areas will be inspected by a suitably qualified ecologist for the presence of breeding birds prior to clearance. Areas found not to contain nests will be cleared within three days of the nest survey. Where the vegetation is not cleared within three days of checks, a repeat check will be required. Should nesting birds be encountered during surveys, the removal of vegetation will be required to be delayed until after the nesting has finished.

The proposed overhead powerlines will be fitted with devices to make them more visible to flying birds to mitigate bird collisions. A wide range of wire marking devices are available, generally falling into three basic designs: spiral devices which wrap around the wire (and may act to reduce line vibration as well as making power lines more visible to birds), hanging devices which are suspended from the wire with fixed or swinging plates or flappers; and spheres (also known as aviation balls).

The choice of marking devices should take into consideration a number of issues, including product effectiveness, availability and durability, cost, ease of installation, and structural constraints such as wind and ice loading. Ideally a wire-marking device should last as long as the wire itself (e.g., all steel components of devices should be made of stainless steel and plastic components should be UV stable high impacted PVC).

The devices to be used will be agreed in advance between the appointed Project Ecologist and the local authority.

### 6.5.3 MONITORING

This section details post-construction monitoring. The success of mitigation, compensation and enhancement measures will be measured by their completion. A Project Ecologist employed in an Ecological Clerk of Works (ECOW) role will be appointed to record completion of measures outlined in this report. Post-construction monitoring is proposed to gather information and assess whether the flora and fauna across the proposed

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Planning Department

28 NOV 2022

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route has responded favourably to mitigation, compensation and enhancement measures outlined in 6.5 of this report.

Post-construction monitoring will be undertaken for the items listed below. A programme has been suggested for each item, although the programme will need to be agreed between the appointed Project Ecologist and the local authority. This is because several variables can influence programme, such as the completion date of the proposed development, whether the proposal is completed as a single entity or as several separate projects, or if the proposal is amended in the future:

The effectiveness of the bird deflectors as outlined in Section 6.5.2.4 above will be monitored by a suitably qualified and experienced ecologist. Surveys for flight activity and bird remains will be conducted along the length of the proposed development between T1 and T7 at years 1, 2, 3, 4 and 5 post-completion. The target and monitoring reporting will be agreed in advance with the local authority.

## **6.6 RESIDUAL IMPACTS**

### **6.6.1 DESIGNATED SITES AND DOWNSTREAM AQUATIC ENVIRONMENT**

Assuming the full and successful implementation of the mitigation measures outlined above, no significant residual impacts are predicted on the receiving aquatic environment or downstream European or Nationally designated sites at any geographical scale.

### **6.6.2 HABITATS**

With regard to the KER habitats identified within the proposed development site, there will permanent loss of small areas of dry calcareous and neutral grassland, scrub, recolonising bare ground and dry meadows and grassy verges habitat associated with the construction of the proposed towers and associated foundations. However, given the size of the proposed tower foundations, these areas of habitat loss will be minor. Additionally, as outlined within the Outline CEMP, following construction of the proposed towers, lands will be reinstated with topsoil and vegetation which will minimise the impact of those effects on habitats over the short to medium-term.

There will also be a loss of sections of mixed broadleaf woodland, oak-ash-hazel woodland and broadleaf/conifer woodland habitat as a result of vegetation clearance/ tree topping during construction and operation. As outlined on the Tree Survey Report prepared by Independent Tree Services, vegetation clearance will involve a combination of crowning/topping, coppicing, pruning and height reduction rather than complete removal. This along with the mitigation strategy to protect trees to be retained, will minimise the impact of those effects on habitats over the medium to long-term. Although there will be an impact on higher value habitats (e.g., oak-ash-hazel woodland) as a result of habitat loss, the proposed development is not likely to result in long-term effects on habitats and will not result in a likely significant negative residual effect, at any geographic scale.

### **6.6.3 BADGER**

Assuming the full and successful implementation of the mitigation measures outlined above, no residual impacts are predicted on the local badger population at any geographical scale.

### **6.6.4 OTTER**

Assuming the full and successful implementation of the mitigation measures outlined above with regard surface water protection during construction, no residual impacts are predicted on the local otter population at any geographical scale.

### **6.6.5 OTHER SMALL MAMMALS**

Significant effects have not been identified for other small mammals, and there will be no residual effects for other small mammals arising from the proposed development at any geographic scale.

### 6.6.6 BATS

Assuming the full and successful implementation of the mitigation measures outlined above, no residual impacts are predicted on roosting/foraging/commuting bats at any geographical scale.

### 6.6.7 BREEDING AND WINTERING BIRDS

Direct mortality from collisions with overhead lines to breeding and wintering during operation of the proposed development will likely result in a negative effect on the local bird population. Although the mitigation measures outlined within Section 6.5.2.4 within this report will minimise the impact of those effects on the local bird populations residual impacts on birds will remain during operation. Therefore, the proposed development is likely to result in long-term effects on breeding and wintering populations and will result in a likely significant negative residual effect at the local to national geographic scale, depending on the species impacted upon.

### 6.6.8 MOLLUSCS

Assuming the full and successful implementation of the mitigation measures outlined above, no residual impacts are predicted on roosting/foraging/commuting bats at any geographical scale.

### 6.6.9 WHITE-CLAWED CRAYFISH

Assuming the full and successful implementation of the mitigation measures with regard surface water protection during construction outlined above, no residual impacts are predicted on white-clawed crayfish at any geographical scale.

## 6.7 CUMULATIVE IMPACT

This section of the report presents the assessment carried out to examine whether any other proposed developments have the potential to act cumulatively with the proposed development to give rise to likely significant effects on biodiversity. The following proposed and permitted developments within the existing Intel site have been considered in the cumulative impact assessment:

- Intel Manufacturing Facility; Permitted KCC Ref. 22/491
- Intel Manufacturing Facility; Permitted KCC Ref 21/1398
- Intel Manufacturing Facility; Permitted KCC Ref. 21/229 Intel Manufacturing Facility; Permitted and under construction (ABP Ref. PL09.248582 (KCC Ref. 16/1229))
- Intel Manufacturing Facility; Permitted KCC Ref. 19/1054
- Intel Manufacturing Facility; Permitted ABP Ref. PL09.307806 (KCC Ref. 20/333)
- Intel Manufacturing Facility; Permitted KCC Ref. 19/1339. Modifications to permitted ABP Ref. PL09.304672 (KCC Ref. 19/91)
- Intel Manufacturing Facility; Permitted KCC Ref. 16/1063
- Intel Manufacturing Facility; Permitted KCC Ref. 14/750
- Intel Manufacturing Facility; Permitted KCC Ref. 14/100
- Intel Manufacturing Facility; Permitted KCC Ref. 13/837
- Intel Manufacturing Facility; Permitted ABP Ref. PL09.242826 (KCC Ref. 13/786)
- Intel Manufacturing Facility; Permitted KCC Ref. 12/993
- Intel Manufacturing Facility; Permitted ABP Ref. PL09.241071 (KCC Ref. 12/435)
- Intel Manufacturing Facility; Permitted KCC Ref. 12/398
- Intel Manufacturing Facility; Permitted KCC Ref. 12/135
- Intel Manufacturing Facility; Permitted KCC Ref. 11/1207

There are also a number of permitted and proposed developments in the wider surrounding environment, outlined in Section 17.4 which have been considered within this section.

The surrounding lands to the north are zoned for agricultural use. The Louisa Bridge site, directly east of the proposed development site as well as lands to the south are zoned as open space and for amenity use. Neither of these land use zonings are likely to result in developments that would act cumulatively with the

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Planning Department  
28 NOV 2022

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proposed development to affect biodiversity locally. The most likely cumulative effect of other future development with the proposed development on the receiving environment is the potential for other pollution sources within the Rye Water catchment, the River Liffey catchment, and any other catchments that also drain to Dublin Bay (e.g. the Dodder and the Tolka catchments) to cumulatively affect water quality in the receiving surface water, estuarine and marine environments.

Additional potential cumulative impacts of other future developments with the proposed development on the receiving environment is the potential for disturbance along the Rye Water during construction and/or operation of other granted and future developments located along the Rye Water. However, any long-term effects on biodiversity are likely to be moderated by the environmental protective policies and objectives of the *Kildare County Development Plan 2017-2023* and the *Draft Leixlip LAP 2020 - 2026*.

There are general overarching policies in the *Kildare County Development Plan 2017-2023* to ensure that proposals for development integrate the protection and enhancement of biodiversity (Policy NH 2) and to identify and protect sites of local biodiversity importance (Objective NHO 1). There are also specific objectives to protect European sites (Policy NH 4), prevent development that would adversely affect the integrity of any European site(s) (Policy NH 5), protect designated or proposed natural heritage areas, nature reserves and Ramsar sites (Policies NH 8, NH9 and NH 10) and to ensure that development does not have significant impact on protected habitats and species (Policies NH 11 and NH 12). The *Kildare County Development Plan 2017-2023* also has specific policies and objectives relating to the protection of surface water and groundwater resources (e.g. WS 1, WS 9, WS10, WS11, WQ 1, WQ 6, WDO 7) and the protection of air quality (PC 10).

The environmental protective policies and objectives set out in the *Kildare County Development Plan 2017-2023* are mirrored in the *Draft Leixlip Local Area Plan 2020-2026* in terms of the protection of European sites and natural heritage areas (Policy NH1 and objectives NHO1.1, NHO1.2, NHO1.3) and biodiversity protection and enhancement generally (Objective NHO1.5), including Local Biodiversity Areas and Key Green Infrastructure Areas (Policy GI 1 and Objectives GIO1.1 – GIO1.11). The LAP also has specific policies and objectives relating to the protection of surface water and groundwater resources (policy I2 and objectives IO2.1, IO2.2, IO2.3, IO2.4 and IO2.5) and the protection of air quality (policy I5 and objective IO5.2).

Land use plans for the other local authorities (e.g. Meath County Council and the Dublin local authorities) whose functional areas also include the Rye Water catchment, or other surface water catchments that drain to Dublin Bay, were examined and analysed and those land use plans also include protective environmental policies to protect biodiversity, designated sites for nature conservation and the receiving surface water, estuarine and marine environments.

Considering the nature and relatively short construction period for the proposed realignment works, the predicted impacts described in Section 6.4 above, the mitigation measures proposed in Section 6.5, and the protective policies and objectives on the land-use plans that will direct future development locally, significant cumulative negative effects on biodiversity are not predicted.

## 6.8 INTERACTIONS

Biodiversity interacts with several environmental factors including Land, Soils, Geology & Hydrogeology, Water & Hydrology, Air Quality & Climate and Noise & Vibration chapters of the EIAR. Changes to these environmental factors could result in significant impacts on biodiversity such as the following:

**Water & hydrology** – interactions between water & hydrology and biodiversity including habitats, flora and fauna can occur through impacts to water quality either arising from an accidental pollution event or increased sedimentation during the construction stage, the potential release of contaminated dewatered groundwater into the local surface water network during construction or an accidental pollution event during the operational stage. This interaction has the potential to result in significant impacts on hydrologically connected habitats and sensitive fauna that rely on these habitats. Following the implementation of mitigation measures outlined in Section 6.5.1.1, impacts to habitats, flora and fauna from water & hydrology interactions are not predicted to be significant.

**Land, Soils, Geology & Hydrogeology** – interactions between hydrogeology, soils & land and biodiversity can occur through an accidental pollution event during construction, which could result in habitat degradation of habitats within the proposed development site and adjacent/downstream designated sites and their associated qualifying interests. Following the mitigation measures outlined within Section 6.5.1.1 impacts to habitats, flora and fauna from lands, soil, geology and hydrogeology interactions are not predicted to be significant.

**Air quality & climate** – interactions between air quality and flora and fauna in adjacent habitats and designated sites can occur during the construction stage due to dust emissions arising from construction works. This interaction has the potential to result in significant impacts on biodiversity. However, given the location, scale and nature of the proposed development, impacts to flora and fauna are not predicted to be significant.

**Noise & Vibration** – interactions between noise and sensitive fauna, namely birds and badgers can occur and arise from increased noise levels during the construction stage. This interaction has the potential to result in significant impacts and has been assessed when considering disturbance impacts during construction. Following the implementation of mitigation measures outlined in Sections 6.5.1.3 and 6.5.1.4, impacts to fauna from noise interactions are not predicted to be significant.

Kildare County Council  
Planning Department

28 NOV 2022

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## 7 LAND, SOILS, GEOLOGY & HYDROGEOLOGY

### 7.1 INTRODUCTION /METHODOLOGY

This chapter assesses and evaluates the potential impacts of the proposed development on the land, soil, geological and hydrogeological aspects of the site and surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

#### 7.1.1.1 Criteria for Rating of Effects

This chapter evaluates the effects, if any, which the proposed development will have on Land, Soils, Geology and Hydrogeology as defined in the Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022). The Draft EPA document entitled 'Advice Notes for Preparing Environmental Impact Statements' (EPA, 2015) is also followed in this geological and hydrogeological assessment and classification of environmental effects. Due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled 'Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements' (IGI, 2013). In addition, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII, 2009) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental effects on the land, soil, geological and hydrogeological environment is based on the standard EIAR impact predictions table included in Chapter 1 which takes account of the quality, significance, duration, and type of effect characteristic identified (in accordance with impact assessment criteria provided in the EPA Guidelines (2022) publication).

The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

The TII criteria for rating the magnitude and significance of impacts on the geological related attributes and the importance of hydrogeological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Tables 1-5 in Appendix 7.1.

The principal attributes (and effects) to be assessed include the following:

- Geological heritage sites in the vicinity of the perimeter of the subject site;
- Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground;
- The quality, drainage characteristics and range of agricultural uses of soil around the site;
- Quarries or mines in the vicinity, the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material on site as well or requirement to remove it off-site as waste for disposal or recovery;
- High-yielding water supply springs/ wells in the vicinity of the site to within a 2 km radius and the potential for increased risk presented by the proposed development;
- Classification (regionally important, locally important etc.) and extent of aquifers underlying the site perimeter area and increased risks presented to them by the proposed development associated with aspects such as for example removal of subsoil cover, removal of aquifer (in whole or part), drawdown in water levels, alteration in established flow regimes, change in groundwater quality;

- Natural hydrogeological/karst features in the area and potential for increased risk presented by the activities at the site; and
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally.

### 7.1.2 SOURCES OF INFORMATION

Desk-based geological information on the substrata (both Quaternary deposits and bedrock geology) underlying the extent of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1: 100,000 mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

Site specific data was derived from the following sources:

- Geotechnical Interpretative Report. Collinstown 110kV OHL Diversion. IGSL, July 2022;
- Geotechnical Interpretative Report (Factual). Collinstown 110kV OHL Diversion. IGSL, June 2022;
- Design Report. Collinstown 110kV OHL Diversion Project. Mott MacDonald, December 2021;
- CEMP Information. Collinstown 110kV OHL Diversion Project. Mott MacDonald, March 2022;
- Hydrological and Hydrogeological Qualitative Risk Assessment for A Ground Investigation Works Execution Plan at Intel Ireland Campus. Leixlip, Co. Kildare. AWN, March 2022;
- Various design site plans and drawings.

## 7.2 THE PROPOSED DEVELOPMENT

### 7.2.1 GENERAL DESCRIPTION OF THE DEVELOPMENT

The proposed realignment will consist of the following principal elements:

- The installation of 7 new double circuit steel lattice towers and replacement of 2 existing double circuit towers ranging in height from approximately 20.75 m to 39.75 m above ground level and supporting three electrical conductors, one earth wire and associated overhead line infrastructure
- The decommissioning and removal of 4 existing towers and associated electrical conductors
- All ancillary site development, preparation and reinstatement works:

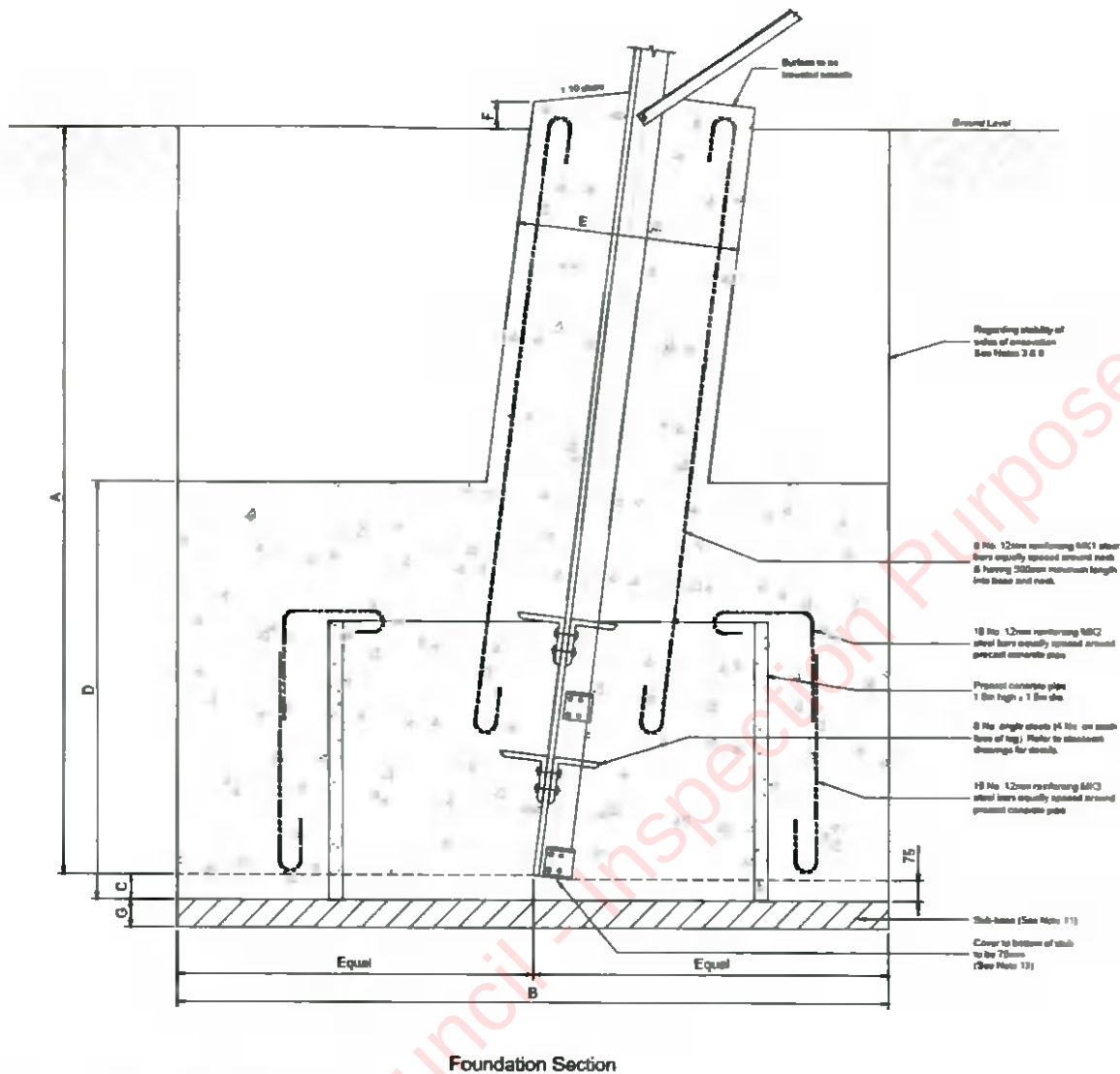
There are three tower types to be utilised within the OHL diversion depending on functions of the tower. As per design report the tower types are:

- Type 1463 DE: T1, T2, T5 & T7;
- Type 1403 DE: T3 & T6;
- Type 1493 DET:T4.

The dimensions for each foundation is presented in Table 7.1 and Figure 7.1 below.

**Table 7.1 Foundation Dimensions**

| Towers          | Size (m) |      |        | Dimensions (mm; as per Figure 7.1) |       |     |       |       |     |     |
|-----------------|----------|------|--------|------------------------------------|-------|-----|-------|-------|-----|-----|
|                 | Deep     | Wide | Length | A                                  | B     | C   | D     | E     | F   | G   |
| T3 & T6         | 2.8      | 4    | 2.5    | 2,800                              | 2,500 | 90  | 1,600 | 800   | 100 | 100 |
| T4              | 4        | 4    | 4      | 4,000                              | 4,000 | 105 | 2,800 | 1,000 | 300 | 100 |
| T1, T2, T5 & T7 | 4        | 4    | 3.8    | 4,000                              | 3,800 | 105 | 2,000 | 1,200 | 300 | 100 |



**Figure 7.1 Foundation Section**

At the depths below ground at which foundation bases are installed, various types of soil, gravelly soil, and rock will be excavated. All topsoil excavated in the construction of tower foundations will be reinstated where possible, on completion of the proposed works. Where practical and appropriate, excavated subsoil will be used for associated construction and landscaping purposes.

All surplus waste arising during the construction phase will be managed and disposed of to a licensed landfill. This ensures compliance with the provisions of the Waste Management Act 1996 (as amended) and the extant Eastern Midlands Region Waste Management Plan (2015-2021). A Construction Waste Management Plan will be implemented to minimise waste and ensure correct handling and disposal of construction waste streams in accordance with the "Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects" (Environmental Protection Agency, 2021).

Site enabling works will be carried out at the outset of the construction phase. This will include clearing the site, removal of fences, cutting back of trees and vegetation and laying of temporary access tracks to tower positions.

The construction material storage yard is proposed to be located in the existing southern car parks within Intel's compound, between towers T1-T2 and T2-T3. The compound, of approximately 3500 m<sup>2</sup>, will be located to the northern side of the R148. Temporary access routes capable of

accommodating construction plant, construction materials and personnel, are required for the construction of each tower, installation of the conductor and the setting up of guarding locations. The temporary access road to T4 will be kept at the greatest possible separation distance from the SAC. The berm area in this zone will remain untouched.

T1, T2, and T3 are positioned on existing hardstanding areas. Ground preparation works for craneage is therefore not required in these areas. T4, T6 and T7 are located in areas of soft ground or pasture areas. For these locations, ground will be required to be levelled and built up with stone and compacted for craneage. The California Bearing Ratio (CBR) value of the ground has to be taken before placement of the crane. In the case of T5, the access route to the tower location is steep. Derrick methodology may therefore have to be used for the erection of this tower. Working areas around tower locations have allowed for a 15 m x 15 m area for crane pads.

The approximate quantity of soil to be stockpiled and the quantity of soil to be taken off site for each tower is estimated as follows.

**Table 7.2 Earth Work Estimation**

| Tower | Volume of muck away (m <sup>3</sup> ) | Volume of Stockpile (m <sup>3</sup> ) |
|-------|---------------------------------------|---------------------------------------|
| T1    | 120                                   | 220                                   |
| T2    | 120                                   | 250                                   |
| T3    | 40                                    | 90                                    |
| T4    | 180                                   | 150                                   |
| T5    | 120                                   | 220                                   |
| T6    | 40                                    | 150                                   |
| T7    | 120                                   | 240                                   |

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## 7.2.2 CONTROL ENVIRONMENTAL MEASURES

The following control measures will be used to avoid release of cement leachate from the site:

- No batching of wet-cement products will occur on site;
- Ready-mixed concrete will be delivered to the excavation site. Where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements will be used;
- Shuttering and formwork shall be checked for gaps by the EnCoW in advance of pouring. Where necessary, polyurethane foam will be used to seal shuttering joints to prevent concrete leaking.
- Wash-down of concrete contaminated equipment will not take place within the site.
- Concrete trucks will be brought as close as possible to the excavation to pour directly into the excavation. If this is not possible, concrete will be transported in dumpers fitted with concrete chutes;
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed;
- Weather forecasting will be used to plan dry days for pouring concrete;
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event;
- The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a concrete washout area.

Wash-out of concrete trucks will not occur at the proposed development site, instead wash-out will be undertaken at the supplier washout facility. The location for the washout facilities is in Kilsaran, Adamstown, Lucan, Dublin and Roadstone which is located at Roadstone retail belgard, Tallaght, Dublin.

All chemicals and fuels will be stored properly in identified areas within the construction compound.

There will be a bunded bowser located in the construction compound to refuel track machines, site dumpers, rollers and articulated dumpers, etc. Refuelling should take place within areas of hardstanding. The bowser will be filled directly from delivery tanker. A drip tray placed under the filling point at all times to prevent discharges of fuel. Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment.

Refer to Chapter 4 *Project Description* for further details.

## 7.3 THE RECEIVING ENVIRONMENT

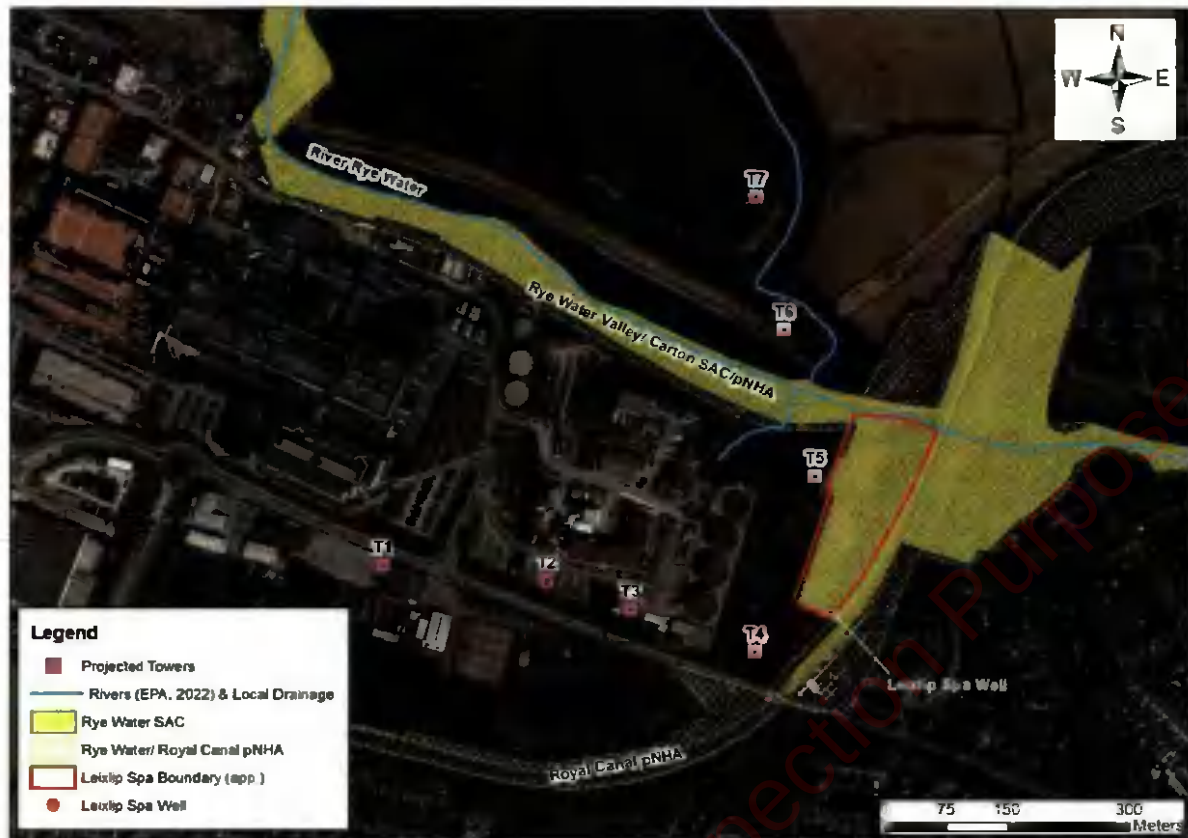
The receiving environment is discussed in terms of land geology, soils, hydrogeology and site history including potential for existing and historical contamination.

### 7.3.1 GENERAL DESCRIPTION OF THE SITE

The development site is associated with the realignment project of the 110kV OHL which traverses the Intel campus. The chosen route consists of the diverting of the OHL to the East of the campus site with connections to the existing overhead line at the Lidl carpark at the south of the site (T1) and to the existing overhead line at a location north of the River Rye (T7).

The OHL diversion project is located within an environmentally sensitive area. The line runs in close proximity to the Rye Water Valley/Carton SAC which stretches along either side of the River Rye from the Carton Estate to the Leixlip Spa. The area and its wildlife are protected from site development and disturbance. The area is designated as a SAC due to the value of the area to the local community and the presence of a wide diversity of wildlife, including some endangered species. The overhead line crosses the River Rye between Tower 6 and Tower 7. Refer to Figure 7.2 below for site location in relation to SAC and Leixlip Spa.

Intel Ireland's Leixlip campus is located off the R148 Maynooth-Leixlip Regional Road approximately 1.6 km north of the M4 motorway route (Junction 6) and 2 km northwest of Leixlip town centre. To the front (south) of the plant the campus grounds are mainly flat in topography consisting of employee multi-level car parks, tarmacadam-surfaced car parks and, in Eastlands, gravel-surfaced car parks. Peripheral landscaped areas bound the site. To the rear of the plant there is a gradual slope descending from south to north towards the Rye Water River valley. There is, however, a pronounced descent from the elevation of the newly built Process Water Tanks in Eastlands (c.59 m OD) through to the green belt referred to earlier (T4 & T5 / 55 – 47 m OD) and beyond to the Rye Water River (c.33 m OD).



**Figure 7.2 Site Location and Local Environment**

### 7.3.2 LOCAL DRAINAGE

The River Rye Water passes to the north of the Eastlands site and is one of the main sensitive receptors in the proximity of the site. The watercourse generally runs along the northern boundary of the Intel site from west to east and has been shown to lie in/ at areas of varying geology including Clays and Gravels

The Leixlip Spa site in Co. Kildare is a wetland area which developed on five distinct terraces with shallow bedrock and constitutes part of the Rye Water Valley Special Area of Conservation, site code: 001398.

Historical monitoring data (Hydro-G, 2008) analysis suggest that water at the Leixlip Spa site (which comprises a warm and cold spring) originates from a complex groundwater system combining two sources. The main source of water comes from a deeper, older and warmer groundwater system, discharging at the top of the first terrace through the Spa Well. The second is a more recent, shallow groundwater that flows through the karstified limestone bedrock with the main groundwater discharge located in the vicinity of the fen wetland habitat ('filtering ponds') at the most elevated, southern terrace, i.e. Louisa Bridge springs.

On a local scale, no ditches or active open water courses have been identified in the immediate vicinity of the projected towers. Nevertheless, there is a ditch running north-south to the east of both T4 and T5 which seems to be dry.

As can be seen in Figure 7.2 above there is a small-scale stream close to the River Rye Water itself.

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### 7.3.3 HISTORICAL AND EXISTING LAND USE

The historic mapping below indicates the prior use of the site from the earliest mapping available 1837-1842 through to the present use by Intel. The Ordnance Survey Ireland (OSi) online historical maps were consulted as part of this assessment. OSi maps were available from 1830 historic 6" maps and 1900 from the historic 25" maps. The historic maps indicate that the subject site was greenfield prior to the Intel development in the area. Mass movement of soil / rock eastwards can be observed during construction of nearby FAB24. Haul roads can be seen to angle their way through the site in the OSI map dated 2000. In the OSI aerial orthophotograph dated 2005, the gravel-surfaced car park at IR96 appears to be fully developed towards the east of the site. A grassed soil berm appears along the eastern flank of the car park, its height defined by the shadow it casts in the aerial image. Some ground disturbance can also be seen to the east of the same berm. Refer to Figure 7.3 to Figure 7.7 below.

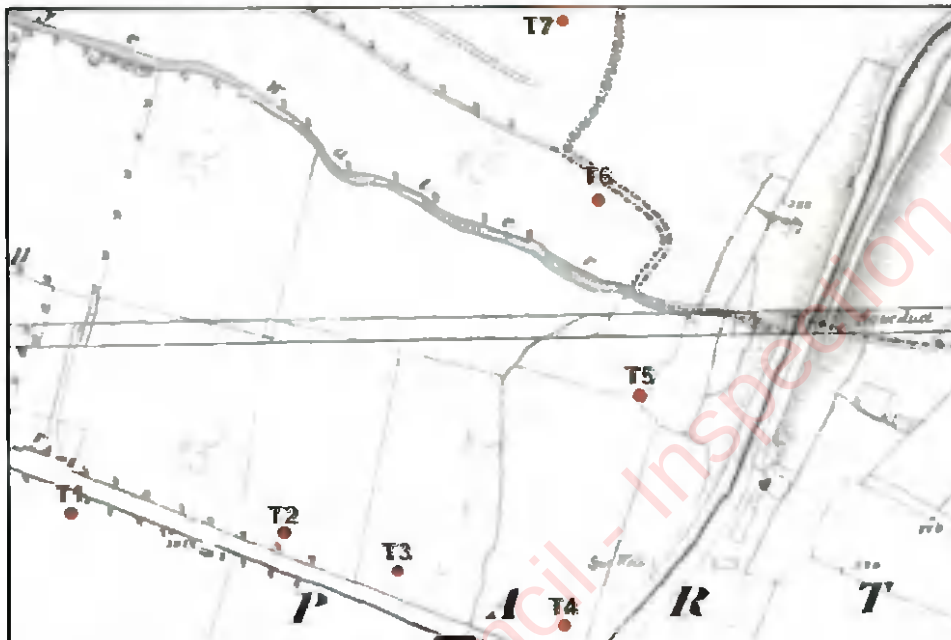


Figure 7.3 Historic 6" Mapping<sup>19</sup>

<sup>19</sup> Source: OSi, 2022



Figure 7.4 Historic 25" Mapping<sup>19</sup>

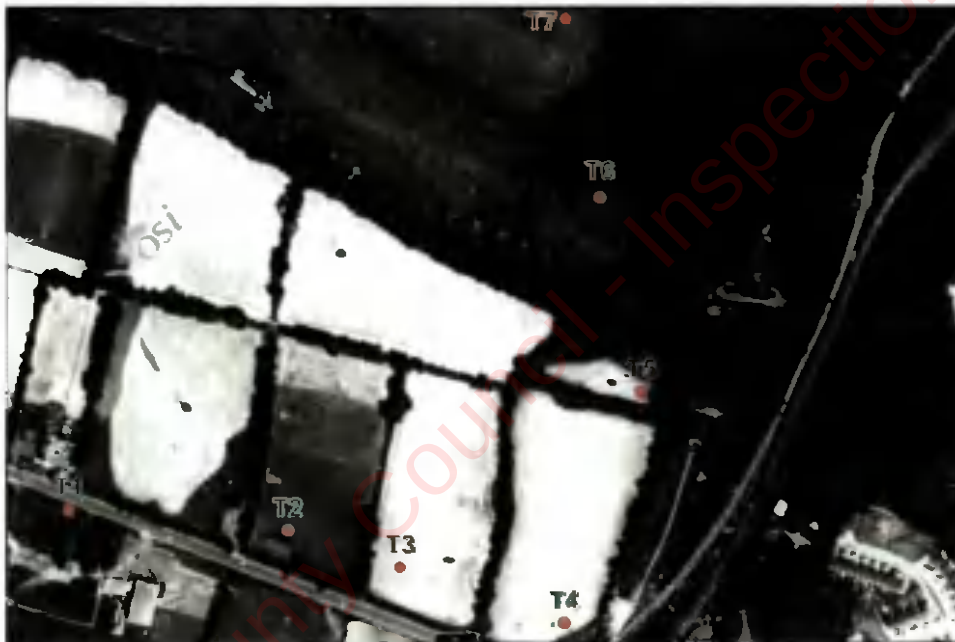


Figure 7.5 Historic 1995 Aerial Map<sup>19</sup>

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**Figure 7.6 Historic 2000 Aerial Map<sup>19</sup>**



**Figure 7.7 Historic 2005 Aerial Map<sup>19</sup>**

According to the EPA (2022) there are no other licensed IPPC/ IEL facilities in the immediate vicinity of the development site in addition to the Intel licence.

#### **7.3.4 SITE INVESTIGATIONS**

A geotechnical site investigation was carried out during May and June 2022 by IGSL whose works were conducted to enable design of the proposed diversion of the existing Maynooth-Ryebrook 110kV overhead line (OHL) and associated transmission infrastructure. As mentioned above, the locations were sited towards the east of the Intel Leixlip campus. The exploratory holes for five proposed tower locations were located in the IR96 car park (T2 & T3), a greenbelt to the eastern edge of the campus (T4 & T5) and in what is termed the North Field, north of the Rye Water River.

Preliminary slit trench ground investigations were carried at the tower locations within Intel's land to the south of the River Rye (T2 – T5), to ascertain any presence of services and the properties of the

ground at each location. Samples were taken to establish the profile of the soil for foundation design. Further borehole ground investigation works at each tower location to obtain the detailed and precise ground composition are currently in progress, the results and analysis of which will feed into the detailed civil design and environmental control requirements. These will ascertain the level of both water table and rock, which will provide certainty of foundation design to proceed with planning permission for the project.

The investigations comprised the following:

- Inspection Pits (5 No.)
- Cable Percussion Boring (4 No.)
- Rotary Core Drillholes (5 No.)
- Slit Trenches / H-digs (3 No.)
- Groundwater Monitoring
- Gas Monitoring
- Surveying of Exploratory Hole Locations

Cable percussion boring (200 mm diameter) was undertaken at four locations (BH02, BH03, BH04 and BH05, associated to towers T2, T3, T4 and T5, respectively). These boreholes extended to depths of between 3.50 m and 9.0 m below ground level (mbgl). Rotary core drilling was carried out at 5 no. locations (same as cable boreholes in addition to tower T6). In the case of core drillholes 2, 3, 4 and 5 drilling continued down the same pre-bore made by the corresponding cable percussion borehole. At location RC06, drilling was conducted from the base of the pre-dug inspection pit. No cable percussion borehole was carried out at Tower 6 location given the shallow depth to bedrock proven in nearby slit trenches (c. 1.70 m bgl). Slit trenching was undertaken at three locations in the North Field at the proposed Tower 6 location.

Figure 7.8 below presents location of these investigation points.



**Figure 7.8 Site Investigation Points<sup>20</sup>**

<sup>20</sup> Source: IGSL, 2022

Selected soil samples were taken from the inspection pits and boreholes and were analysed for Soil, Leachate and Rilta Suites (i.e., 'Full WAC Suite' plus loss on ignition and asbestos screen). Groundwater samples were retrieved at each of five water well installations on the site.

### 7.3.5 SOILS

The GSI/ Teagasc Subsoil Map of Ireland shows the soil covering the site to be predominantly gleys and brown earths derived from limestone glacial till which is to be expected, given the underlying bedrock. The soil mapping indicates that the soils comprise primarily of basic grey brown podzolics and brown earths (BMinPD and BMinDW) at the site (refer to Figure 7.9 below). This ground conditions have been confirmed by site investigations undertaken in the subject site, which have described the local topsoil as sandy gravelly Clay. However, made ground composed of granular fill was encountered within the Intel campus. (T2 & T3).

Brown earths are relatively mature, well-drained, mineral soils possessing a rather uniform profile that have not been extensively leached or degraded. Brown Earths possess medium soil texture and have good structure and drainage characteristics and are extensively cultivated. They have relatively low nutrient status.



Figure 7.9 Soils Map<sup>21</sup>

### 7.3.6 SUBSOILS

The Quaternary geological period extends from about 1.5 million years ago to the present day and can be sub-divided into the Pleistocene Epoch, which covers the Ice Age period and which extended up to 10,000 years ago and the Holocene Epoch, which extends from that time to the present day.

The GSI/ Teagasc mapping database of the subsoils in the surrounding area of the subject site indicates that the subsoil beneath the towers located in the southside of the Rye Water comprises Till

<sup>21</sup> Source: Teagasc, 2022

derived from Limestones (TLs) which are typically associated with low permeability clays (refer to Figure 7.10 below).

The mapping also shows alluvial deposits along the Rye Water SAC and local drainage (T6 site). Gravels derived from Limestones are presented to the northside of the SAC (T7 location).

On a local scale, the site investigation carried out by IGSL in 2022 is generally consistent with the GSI description. Subsoils across the site were identified as cohesive sandy gravelly Clay (even in T6). However, as mentioned above, 3.9-5.5 m depth made ground composed of granular fill was encountered within the Intel campus. (T2 & T3 locations). Granular deposits (gravels) underlying the cohesive subsoils were also encountered at T4 and T5.

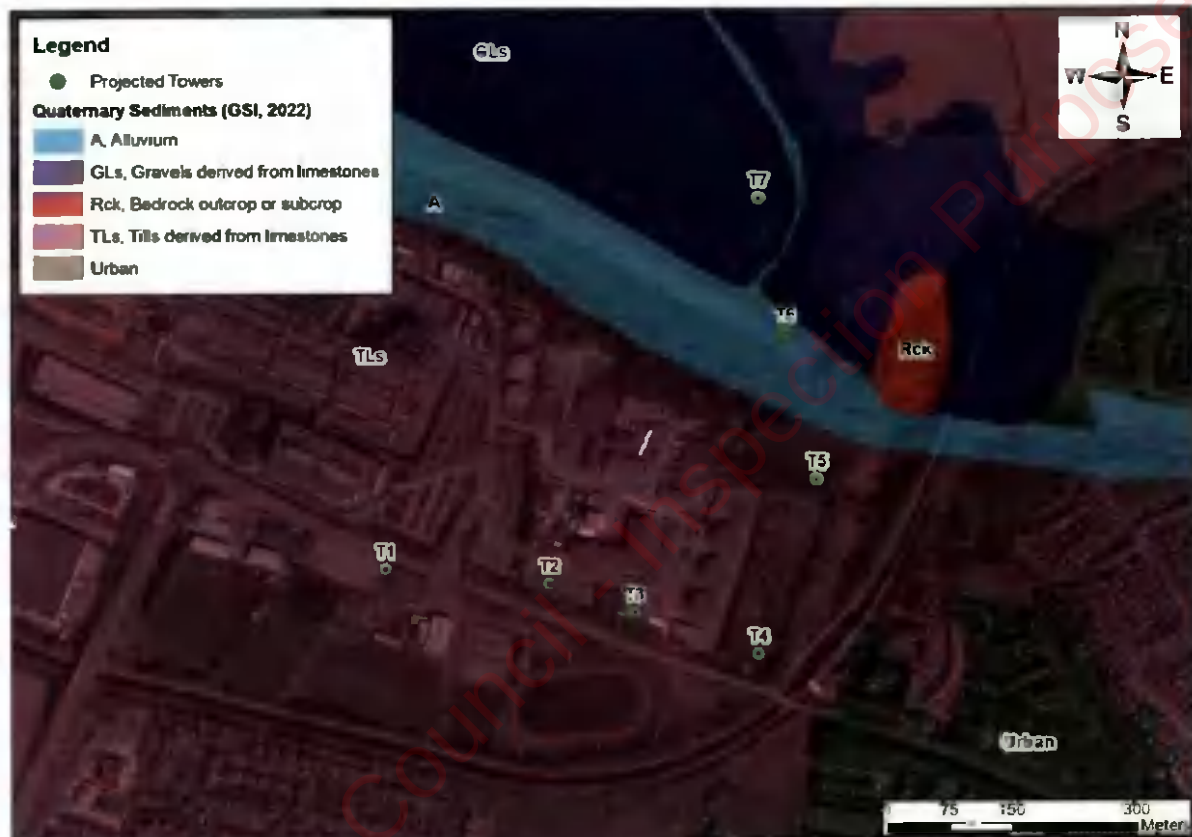


Figure 7.10 Subsoils Map<sup>22</sup>

### 7.3.7 BEDROCK GEOLOGY

A review of the available GSI (2022) records (on-line mapping database) shows that the bedrock underlying the site is part of the Lucan Formation (code CDLUCN; see Figure 7.11 below). The Lucan Formation (Nolan 1986, 1989) forms the bulk of the basinal rocks throughout the geologically termed 'Dublin Basin', and is characterised by graded, intraclastic skeletal packstone/grainstone interbedded with anoxic calcareous mudstone / black shale, laminated calcisiltite and argillaceous micrite (i.e. impure limestone with clay minerals). Its base is defined by the first appearance of thick graded beds of limestone, and a marked decrease in the proportion of interbedded shale, compared with the underlying Tober Colleen Formation. The Lucan Formation is widely known as the Calp Limestone (Marchant and Sevastopulo, 1980) but is also referred to as the Upper Dark Limestone and has long been a source of building materials and aggregate for Dublin. The Calp is largely undifferentiated geologically.

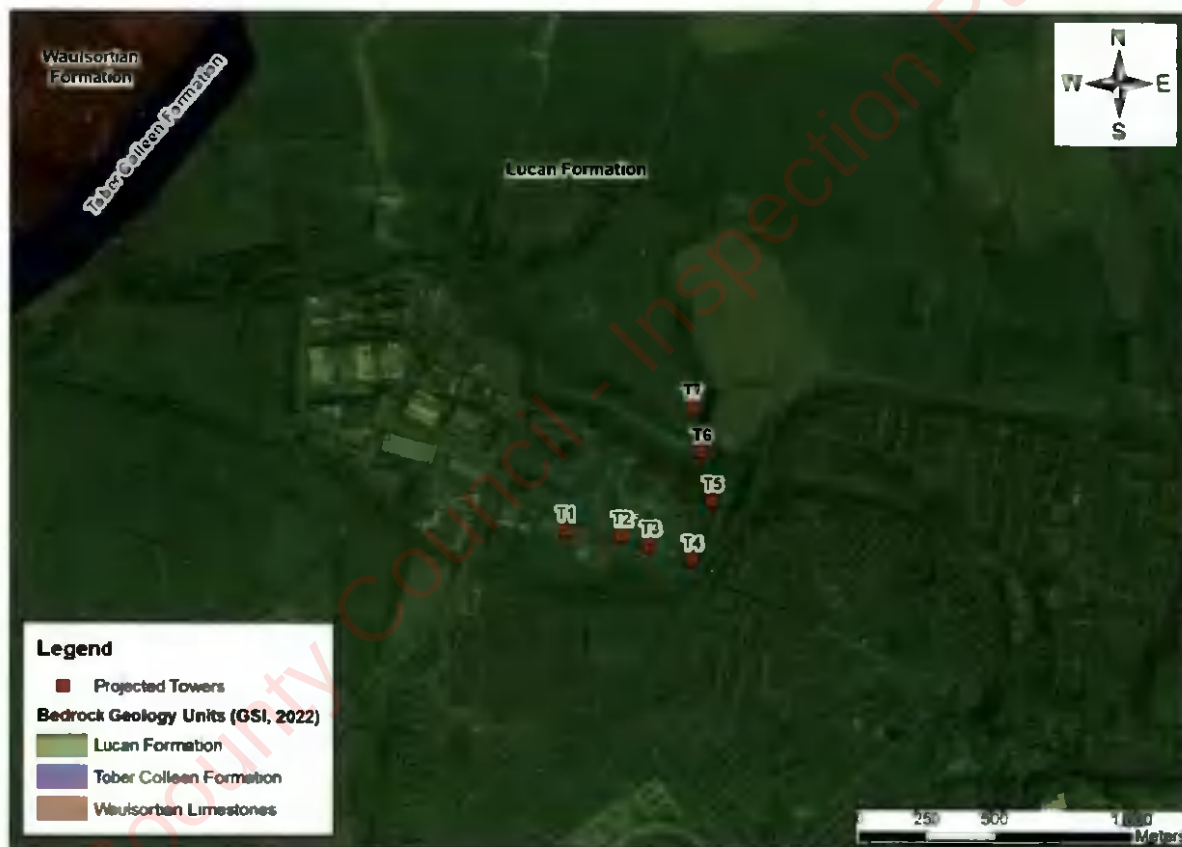
The intrusive site investigation carried out by IGSL in 2022 have confirmed the presence of limestone bedrock at the site at a depths of 13.3 mbgl (T2), 9.0 mbgl (T3), 5.0 mbgl (T4), 16 mbgl (T5) and 2.0 mbgl (T6).

<sup>22</sup> Source: IGSL, 2022

mbgl (T6). The grey limestone was described as strong to weak and included subordinated mudstone and local stylolites and slightly to moderately weathered at thin.

There are no geological faults indicated on the GSI bedrock geology maps beneath the proposed new development. A review of available core logs (IGSL 2022) show no indication of significant faulting within this area. According to the GSI online database, no karstic features are located at the proposed site.

The Calp limestone is dominated by low permeability limestones and shales, with higher permeability areas only occurring where fracturing or karstification has occurred. There is no evidence of faulting or karstification on the site of the proposed development. Aquifer transmissivity (T) is the average hydraulic conductivity by the saturated thickness of the aquifer. Results of pump testing in this area of the site indicate approximate T values of 1- 1.5 m<sup>2</sup>/d. The T values for the site are lower than what would be expected in terms of a typical range of 10 - 150 m<sup>2</sup>/d for the Dublin Groundwater Body (GWB) according to the GSI database (GSI, 2015). Higher T values are recorded where interconnected fractures are recorded. This was not observed to date during any testing on the Intel site.



**Figure 7.11 Bedrock Geology Map<sup>23</sup>**

### 7.3.8 SUMMARY OF SITE SPECIFIC SOIL CONDITIONS

As mentioned in Section 7.3.4 above, site investigation has been undertaken along the proposed line diversion. Cross sections of the geology and hydrogeology are presented in the conceptual site model section of the report (Section 7.3.18 below). The lithology encountered in the footprint of the proposed development is as follows:

<sup>23</sup> Source: IGSL, 2022

### 7.3.8.1 Topsoil

Top soil composed of sandy Silt/Clay was encountered at boreholes positions within grassed area and SAC (T4, T5 and T6). Top soil was generally 0.2-0.4 m thick.

### 7.3.8.2 Made Ground

Made Ground/ Granular Fill was encountered within Intel Campus and was 5.5 m and 3.9 m thick in BH2 and BH3, respectively. The made ground from both of these boreholes comprises sandy gravelly Clay.

### 7.3.8.3 Cohesive Deposits

Within the Intel Campus, below the layer identified as Made Ground, the subsoil was generally sandy gravelly Clay proven in depths up to 12.0 mbgl in BH/RC2 and 8.5 mbgl in BH3.

BH4 and BH5 in the grassland area overlie granular deposits and presented cohesive deposits (sandy gravelly Clay) at depths up to 1.2 mbgl and 13.2 mbgl, respectively. RC6 encountered sandy gravelly Clay at a depth up to 2.0 mbgl.

### 7.3.8.4 Granular Deposits

Granular deposits layer composed of clayey sandy Gravel were encountered in BH4 and BH5 locations underlying the cohesive deposit layer. In BH4 they were encountered from 1.2 to 5.0 mbgl and in BH5 from 13.2 to 16.0 mbgl. In both locations these gravels overlie the bedrock unit. Granular deposits in BH5 are associated to alluvial deposits.

### 7.3.8.5 Bedrock

The depth at which weathered rock was encountered varies beneath each tower area as follows:

- BH/RC2: 13.0 mbgl;
- BH/RC3: 9.0 mbgl;
- BH/RC4: 5.0 mbgl;
- BH/RC5: 16.0 mbgl;
- RC6: 2.0 mbgl;

## 7.3.9 REGIONAL HYDROGEOLOGY

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km<sup>2</sup>), well yield (m<sup>3</sup>/d), specific capacity (m<sup>3</sup>/d/m) and groundwater transmissivity (m<sup>2</sup>/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (RF) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (LI). Similarly, poor aquifers are classed as either generally unproductive except for local zones (PI) or generally unproductive (Pu).

Reference to the GSI National Draft Bedrock Aquifer Map for the site (see Figure 7.12 below) indicates that the site is underlain by a *Locally Important* Bedrock Aquifer (LI), which is described by the GSI as bedrock as '*moderately productive only in local zones.*'

According to the GSI National Draft Gravel Aquifer Map for the region, the site is not underlain by gravel which could comprise an aquifer.

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Figure 7.12 Aquifer Classification Map<sup>24</sup>

### 7.3.10 GROUNDWATER LEVELS

No significant groundwater strikes were observed during the excavation of the site investigation points (IGSL, 2022). However, in the slit trenches ST06-A, ST06-B and ST06-C groundwater entry was observed in the base of each of the three trenches.

In relation to boreholes, strikes were logged during the course of cable percussion boring at both BH02 and BH04. Groundwater entry was logged as an “overnight seepage” in BH03. Furthermore, groundwater monitoring wells were installed in each drillhole and standing water level (SWL) dip measurements taken at each are presented below.

- RC2 (screened in bedrock): SWL dipped at 5.42 mbgl (53.22 m OD) on 16-06-22;
- RC3 (screened in overburden): SWL dipped at 6.77 mbgl (52.81 m OD) on 16-06-22;
- RC4 (screened in bedrock): SWL dipped at 1.70 mbgl (53.23 m OD) on 01-06-22;
- RC5 (screened in overburden): SWL dipped at 3.80 mbgl (43.12 m OD) on 01-06-22;
- RC6 (screened in bedrock): SWL dipped at 1.20 mbgl (31.71 m OD) on 01-06-22;

Given the low permeability of the natural till soils, it would not be unexpected to find groundwater or perched water ponding in disturbed ground near buried services within the soil overburden. Proposed Tower 6 location lies close to the Rye River in a relatively low-lying area. There may be some connectivity between the groundwater regime in the area of Tower 6 and the level of the nearby Rye Water River.

### 7.3.11 GROUNDWATER QUALITY

The Water Framework Directive (WFD) Directive 2000/60/EC, was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of ‘Good Status’ in water

<sup>24</sup> Source: IGSL, 2022

bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present. 'Good Status' was to be achieved in all waters by 2015, as well as maintaining 'high status' where the status already exists. The EPA co-ordinates the activities of the River Basin Districts, local authorities and state agencies in implementing the directive, and operates a groundwater quality monitoring programme undertaking surveys and studies across the Republic of Ireland.

Presently, the groundwater body in the region of the site (Dublin GWB, IE\_EA\_G\_008) is classified under the WFD Risk Score system (EPA, 2022) as having "Good" Status and its risk score is currently "Under Review" for the last WFD cycle (2013-2018).

Groundwater monitoring was carried out at boreholes BH01, BH02 and BH04 during site investigation in July 2021. The samples were analysed for Total Petroleum Hydrocarbon (TPH), Polycyclic Aromatic Hydrocarbons (PAH), Metals Suite and General physico-chemical suite. Groundwater results were compared with Groundwater Threshold Value (Groundwater Directive S.I. No. 9 of 2010 and amendment; S.I. No. 366 of 2016) and EPA Interim Guidelines (2003) for groundwater where available.

Laboratory results were compared to the abovementioned criteria. Results are presented in Table 7.3 below).

Some few exceedances can be observed for the following parameters:

- BH2: Chloride, NH<sub>3</sub>.
- BH3: Chloride, NH<sub>3</sub>; Hardness; Mn.
- BH4: Chloride, NH<sub>3</sub>; Hardness; TDS.
- BH5: Chloride, Hardness; Cd, Pb, Mn, Ni.
- BH6: Chloride, Hardness;

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**Table 7.3 Groundwater Quality Results<sup>25</sup>**

| Sample ID                                                                                                                                                                                                                                                                                                                                                                    |                                                      |         |         |         | BH02       | BH03       | BH04       | BH05       | BH06       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|---------|---------|---------|------------|------------|------------|------------|------------|
| Laboratory                                                                                                                                                                                                                                                                                                                                                                   |                                                      |         |         |         | Chemtest   | Chemtest   | Chemtest   | Chemtest   | Chemtest   |
| Report                                                                                                                                                                                                                                                                                                                                                                       |                                                      |         |         |         | 22-22945   | 22-22945   | 22-20883   | 22-20883   | 22-20883   |
| Sample Type                                                                                                                                                                                                                                                                                                                                                                  |                                                      |         |         |         | Primary    | Primary    | Primary    | Primary    | Primary    |
| Sample Date                                                                                                                                                                                                                                                                                                                                                                  |                                                      |         |         |         | 18/06/2022 | 18/06/2022 | 06/06/2022 | 06/06/2022 | 06/06/2022 |
| Parameters                                                                                                                                                                                                                                                                                                                                                                   | Units                                                | LOD     | GTV     | EPA IGV |            |            |            |            |            |
| Arsenic                                                                                                                                                                                                                                                                                                                                                                      | mg/l                                                 | 0.0002  | 0.0075  | 0.010   | 0.00074    | 0.00054    | 0.002      | 0.00066    | 0.0009     |
| Barium                                                                                                                                                                                                                                                                                                                                                                       | mg/l                                                 | 0.005   | nv      | 0.1     | 0.026      | 0.098      | 0.055      | 0.082      | 0.049      |
| Beryllium                                                                                                                                                                                                                                                                                                                                                                    | mg/l                                                 | 0.001   | nv      | nv      | -          | -          | -          | 0.0089     | -          |
| Boron                                                                                                                                                                                                                                                                                                                                                                        | mg/l                                                 | 0.01    | 0.75    | 1       | 0.067      | 0.037      | 0.044      | 0.043      | 0.032      |
| Cadmium                                                                                                                                                                                                                                                                                                                                                                      | mg/l                                                 | 0.00011 | 0.00375 | 0.005   | -          | -          | 0.00016    | 0.0079     | 0.00026    |
| Chromium                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.0005  | 0.0375  | 0.03    | -          | -          | 0.0046     | 0.015      | 0.0034     |
| Copper                                                                                                                                                                                                                                                                                                                                                                       | mg/l                                                 | 0.0005  | 1.5     | 0.03    | -          | -          | 0.0016     | 0.0087     | 0.0011     |
| Iron                                                                                                                                                                                                                                                                                                                                                                         | mg/l                                                 | 0.005   | nv      | 0.2     | -          | -          | 0.0091     | 0.031      | 0.0095     |
| Lead                                                                                                                                                                                                                                                                                                                                                                         | mg/l                                                 | 0.0005  | 0.0075  | 0.01    | -          | -          | -          | 0.012      | -          |
| Magnesium                                                                                                                                                                                                                                                                                                                                                                    | mg/l                                                 | 0.2     | nv      | 50      | 24         | 31         | 22         | 20         | 11         |
| Manganese                                                                                                                                                                                                                                                                                                                                                                    | mg/l                                                 | 0.0005  | nv      | 0.05    | 0.027      | 0.39       | 0.035      | 0.37       | 0.0031     |
| Molybdenum                                                                                                                                                                                                                                                                                                                                                                   | mg/l                                                 | 0.0002  | nv      | nv      | 0.04       | 0.0037     | 0.002      | 0.0077     | 0.0051     |
| Nickel                                                                                                                                                                                                                                                                                                                                                                       | mg/l                                                 | 0.0005  | 0.015   | 0.02    | 0.00085    | 0.0008     | 0.0024     | 0.019      | 0.012      |
| Selenium                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.0005  | nv      | nv      | 0.016      | 0.002      | 0.0065     | 0.022      | 0.013      |
| Vanadium                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.0005  | nv      | nv      | -          | -          | -          | 0.0        | 0.0        |
| Zinc                                                                                                                                                                                                                                                                                                                                                                         | mg/l                                                 | 0.0025  | 0.075   | 0.1     | -          | -          | 0.017      | 0.021      | 0.0071     |
| TPH CWG (Note 1)                                                                                                                                                                                                                                                                                                                                                             |                                                      |         |         |         |            |            |            |            |            |
| Aliphatics                                                                                                                                                                                                                                                                                                                                                                   |                                                      |         |         |         |            |            |            |            |            |
| >C5-C6                                                                                                                                                                                                                                                                                                                                                                       | mg/l                                                 | 0.0001  | 0.0075  | 0.01    | -          | -          | -          | -          | -          |
| >C6-C8                                                                                                                                                                                                                                                                                                                                                                       | mg/l                                                 | 0.0001  |         |         | -          | -          | -          | -          |            |
| >C8-C120                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.0001  |         |         | -          | -          | -          | -          |            |
| >C10-C12                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.0001  |         |         | -          | -          | -          | -          |            |
| >C12-C16                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.0001  |         |         | -          | -          | -          | -          |            |
| >C16-C21                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.0001  |         |         | -          | -          | -          | -          |            |
| >C21-C35                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.0001  |         |         | -          | -          | -          | -          |            |
| >C35-C44                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.0001  |         |         | -          | -          | -          | -          |            |
| Total aliphatics >C5-44                                                                                                                                                                                                                                                                                                                                                      | mg/l                                                 | 0.005   |         |         | -          | -          | -          | -          |            |
| Aromatics                                                                                                                                                                                                                                                                                                                                                                    |                                                      |         |         |         |            |            |            |            |            |
| >EC5-EC7                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.01    | 0.0075  | 0.01    | -          | -          | -          | -          | -          |
| >EC7-EC8                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.01    |         |         | -          | -          | -          | -          |            |
| >EC8-EC10                                                                                                                                                                                                                                                                                                                                                                    | mg/l                                                 | 0.01    |         |         | -          | -          | -          | -          |            |
| >EC10-EC12                                                                                                                                                                                                                                                                                                                                                                   | mg/l                                                 | 0.005   |         |         | -          | -          | -          | -          |            |
| >EC12-EC16                                                                                                                                                                                                                                                                                                                                                                   | mg/l                                                 | 0.01    |         |         | -          | -          | -          | -          |            |
| >EC16-EC21                                                                                                                                                                                                                                                                                                                                                                   | mg/l                                                 | 0.01    |         |         | -          | -          | -          | -          |            |
| >EC21-EC35                                                                                                                                                                                                                                                                                                                                                                   | mg/l                                                 | 0.01    |         |         | -          | -          | -          | -          |            |
| >EC35-EC44                                                                                                                                                                                                                                                                                                                                                                   | mg/l                                                 | 0.01    |         |         | -          | -          | -          | -          |            |
| Total aromatics >C5-44                                                                                                                                                                                                                                                                                                                                                       | mg/l                                                 | 0.01    |         |         | -          | -          | -          | -          |            |
| Total aliphatics and aromatics >C10-35                                                                                                                                                                                                                                                                                                                                       | mg/l                                                 | 0.01    |         |         | -          | -          | -          | -          |            |
| MTBE                                                                                                                                                                                                                                                                                                                                                                         | mg/l                                                 | 0.0001  | 0.01    | 0.03    | -          | -          | -          | -          | -          |
| Benzene                                                                                                                                                                                                                                                                                                                                                                      | mg/l                                                 | 0.0005  | 0.00075 | 0.001   | -          | -          | -          | -          | -          |
| Toluene                                                                                                                                                                                                                                                                                                                                                                      | mg/l                                                 | 0.005   | 0.52    | 0.01    | -          | -          | -          | -          | -          |
| Ethylbenzene                                                                                                                                                                                                                                                                                                                                                                 | mg/l                                                 | 0.001   | nv      | 0.01    | -          | -          | -          | -          | -          |
| m/p-Xylene                                                                                                                                                                                                                                                                                                                                                                   | mg/l                                                 | 0.002   | nv      | 0.01    | -          | -          | -          | -          | -          |
| o-Xylene                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 0.001   | nv      | 0.01    | -          | -          | -          | -          | -          |
| Mineral Oil (C10-C40)                                                                                                                                                                                                                                                                                                                                                        | mg/l                                                 | 0.01    | nv      | nv      | -          | -          | -          | -          | -          |
| Total 16 PAH's                                                                                                                                                                                                                                                                                                                                                               | mg/l                                                 | 0.0002  | nv      | nv      | -          | -          | -          | -          | -          |
| Total Phenols                                                                                                                                                                                                                                                                                                                                                                | mg/l                                                 | 0.3     | nv      | nv      | -          | -          | -          | -          | -          |
| Sulphate as SO4                                                                                                                                                                                                                                                                                                                                                              | mg/l                                                 | 1       | 187.5   | 200     | 57         | -          | 53         | 65         | 72         |
| Chloride                                                                                                                                                                                                                                                                                                                                                                     | mg/l                                                 | 1       | 187.5   | 30      | 37         | 250        | 310        | 220        | 49.0       |
| Nitrate                                                                                                                                                                                                                                                                                                                                                                      | mg/l                                                 | 0.5     | 37.5    | 25      | -          | -          | -          | -          | 7.4        |
| Ammoniacal Nitrogen as NH3                                                                                                                                                                                                                                                                                                                                                   | mg/l                                                 | 0.05    | nv      | 0.15    | 0.32       | 0.22       | 0.18       | -          | -          |
| Total Hardness (as CaCO3)                                                                                                                                                                                                                                                                                                                                                    | mg/l                                                 | 1       | nv      | 200     | 190        | 820        | 300        | 290        | 350        |
| Total Dissolved Solids                                                                                                                                                                                                                                                                                                                                                       | mg/l                                                 | 10      | nv      | 1,000   | 410        | 470        | 1,300      | 920        | 620        |
| pH                                                                                                                                                                                                                                                                                                                                                                           | pH units                                             | 6-9     | nv      | nv      | 7.0        | 6.8        | 7.8        | 7.8        | 7.8        |
| Key                                                                                                                                                                                                                                                                                                                                                                          |                                                      |         |         |         |            |            |            |            |            |
| BOLD                                                                                                                                                                                                                                                                                                                                                                         | Value exceeds the Groundwater Threshold Value (GTV)  |         |         |         |            |            |            |            |            |
| Underlined                                                                                                                                                                                                                                                                                                                                                                   | Value exceeds the EPA Interim Guideline Values (IGV) |         |         |         |            |            |            |            |            |
| LOD Laboratory Limit of Detection                                                                                                                                                                                                                                                                                                                                            |                                                      |         |         |         |            |            |            |            |            |
| - Results below LOD                                                                                                                                                                                                                                                                                                                                                          |                                                      |         |         |         |            |            |            |            |            |
| nv Guideline threshold value not available                                                                                                                                                                                                                                                                                                                                   |                                                      |         |         |         |            |            |            |            |            |
| GTV Groundwater Threshold Value (S.I. No. 9, 2010 Groundwater Regulations)                                                                                                                                                                                                                                                                                                   |                                                      |         |         |         |            |            |            |            |            |
| Groundwater Threshold Value (S.I. No. 366, 2016 Groundwater (Amendment) Regulations)                                                                                                                                                                                                                                                                                         |                                                      |         |         |         |            |            |            |            |            |
| IGV Interim Guideline Values (EPA, 2003)                                                                                                                                                                                                                                                                                                                                     |                                                      |         |         |         |            |            |            |            |            |
| Notes                                                                                                                                                                                                                                                                                                                                                                        |                                                      |         |         |         |            |            |            |            |            |
| Note 1. Sum of Total Petroleum Hydrocarbons (TPH) including the volatile petroleum hydrocarbons (VPH) range and extractable petroleum hydrocarbons (EPH) range hydrocarbons C2-C5 and hydrocarbons C6-C40 respectively (S.I. 366 of 2016). The IGV value is a 'catch-all' and includes for analysis of TPH, MTBE, as well as Toluene, Ethylbenzene, m/p-Xylene, and o-Xylene |                                                      |         |         |         |            |            |            |            |            |

<sup>25</sup> Source: IGSL, 2022

### 7.3.12 AQUIFER VULNERABILITY

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures, the main feature that protects groundwater from contamination, and therefore the most important feature in protection of groundwater, is the subsoil (which can consist solely or of mixtures of peat, sand, gravel, glacial till, clays or silts).

The GSI (2022) classifies the aquifer vulnerability in the region as 'Moderate' (south side of the Rye Water) to 'Extreme' (north of the Rye Water) which indicates a range of general overburden depth potential of 0-10 m (refer to Table 7.4 below). The aquifer vulnerability in the region of the site is presented below as Figure 7.13 below.

According to the depth at which rock was encountered during the site investigation, the actual groundwater vulnerability for each tower area will be as follows:

- T2: Low;
- T3: Moderate;
- T4: High (granular overburden);
- T5: Low;
- T6: Extreme;



Figure 7.13 Groundwater Vulnerability Map<sup>26</sup>

<sup>26</sup> Source: IGSL, 2022

**Table 7.4 Vulnerability Mapping Guidelines**

| Vulnerability Rating | Hydrogeological Condition                 |                                            |                                                    |                              |                |
|----------------------|-------------------------------------------|--------------------------------------------|----------------------------------------------------|------------------------------|----------------|
|                      | Subsoil Permeability (type) and Thickness |                                            |                                                    | Unsaturated Zone             | Karst Features |
|                      | High Permeability (sand/gravel)           | Moderate Permeability (e.g. sandy subsoil) | Low Permeability (e.g. clayey subsoil, clay, peat) | (Sand/ gravel aquifers only) | (<30 m radius) |
| Extreme (E)          | 0 - 3 m                                   | 0 - 3 m                                    | 0 - 3 m                                            | 0 - 3 m                      | -              |
| High (H)             | > 3 m                                     | 3 - 10 m                                   | 3 - 5 m                                            | > 3 m                        | n/a            |
| Moderate (M)         | n/a                                       | > 10 m                                     | 5 - 10 m                                           | n/a                          | n/a            |
| Low (L)              | n/a                                       | n/a                                        | > 10 m                                             | n/a                          | n/a            |

Notes: (1) n/a: Not applicable

(2) Precise permeability values cannot be given at present

(2) Release point of contaminants is assumed to be 1-2 below ground surface

### 7.3.13 GROUNDWATER WELLS

The GSI Well Card Index is a record of wells drilled in Ireland, water supply and site investigation boreholes. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in the Republic of Ireland.

The wells recorded by the GSI in the area surrounding the Intel campus site were installed into the underlying bedrock at depths in the range of 3.0 m to 79.2 m bgl. The groundwater yield from these wells ranged from poor to moderate with recorded yields from as little as 5.4 m<sup>3</sup>/day in a well drilled to 39 m BGL in Collinstown up to 88 m<sup>3</sup>/day in a well drilled to 23.2 m BGL in Leixlip. The groundwater yields recorded by the GSI in the townland of Collinstown, where the site is located, range from poor at 5.4 m<sup>3</sup>/day to moderate at 87.3 m<sup>3</sup>/day. Higher groundwater yields are associated with fissures in the bedrock, and it is noted that fissures have not been encountered during site investigation undertaken.

Figure 7.14 below presents the GSI well search for the area surrounding the site (note this source does not include all wells) and below summarises the details of recorded wells present within this search area. Regional groundwater would flow to the towards the River Rye Water.

The proposed development is not located within any public water source protection zone. The nearest public water supply source protection zones is Dunboyne (c. 5 km northwest of the site).



Figure 7.14 GSI Well Search<sup>27</sup>

### 7.3.14 SOIL QUALITY

There are no legislated threshold values for soils in Ireland. As such soil samples were compared to a Generic Assessment Criteria (GAC) derived to be protective of human health, water bodies (including groundwater) and also ecology for a resident and commercial/industrial end use.

GAC in the UK has been derived using the Contaminated Land Exposure Assessment (CLEA) model to be protective of human health for a number of different land uses. LQM (Land Quality Management) and the CIEH (Chartered Institute of Environmental Health) developed a document in July 2009 detailing their own research and derivation of their own 'LQM GACs'. A total of 82 substances including many organic substances had LQM GACs derived, for the standard land uses of residential, commercial/industrial and allotments. This was updated in 2015 following further research and the derived results are now called LQM/CIEH Suitable 4 Use Level (S4UL). The LQM/CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and as transparently derived and cautious "trigger values" above which further assessment of the risks or remedial action may be needed. For each contaminant S4ULs have been derived for six land use scenarios based on assessing exposure pathways in each planning scenario. In this instance the commercial scenario has been considered. Soil type and soil organic matter (SOM) has an influence on the behaviour of contaminants. S4ULs have been derived for three SOM contents (1%, 2.5% and 6%) to cover the likely range in soils. A prudent approach has been taken by considering the lower 1% SOM content.

The UK values do not have any legal standing within the Republic of Ireland and no statutory guidance for assessing the significance of soil contamination currently exists. However, the values do provide a means of placing the data within context when considering magnitude of risk and have been used in that capacity for this assessment.

<sup>27</sup> Source: IGSL, 2022

*Note: The UK values do not have any legal standing within the Republic of Ireland and no statutory guidance for assessing the significance of soil contamination currently exists. However, the values do provide a means of placing the data within context when considering magnitude of risk and have been used in that capacity for this assessment. The main basis of the assessment remains the conceptual site model and consideration of the pollutant linkages: Source – Pathway – Receptor.*

During the sites investigation carried out by IGSL in 2022, 12 no. samples were analysed for a suite of parameters which allows for the assessment of the sampled material in terms of total pollutant content for classification of materials as hazardous or non-hazardous. The suite also allows for the assessment of the sampled material in terms of suitability for placement at licenced landfills (inert, stable non-reactive, hazardous etc.). The parameter list for the suite includes analysis of the solid samples for antimony, arsenic, barium, cadmium, chromium, copper, lead, nickel, mercury, zinc, speciated aliphatic and aromatic petroleum hydrocarbons, pH, sulphate, sulphide, moisture content, soil organic matter and an asbestos screen. The suite also includes those parameters specified in the EU Council Decision establishing criteria for the acceptance of waste at Landfills (Council Decision 2003/33/EC), which for the solid samples are total organic carbon (TOC), speciated aliphatic and aromatic petroleum hydrocarbons, BTEX, phenol, polychlorinated biphenyls (PCB) and PAH. As part of the suite a leachate is generated from the solid samples.

Laboratory results were compared to the abovementioned GAC criteria. Results are presented in Table 7.5 below. As can be seen, analysed parameters did not exceed the threshold valued for commercial or residential use of soil. Asbestos was not detected in any of the samples taken.

Table 7.5 Soil Quality Results<sup>28</sup>

| Sample ID                   | IPB402                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | IPB402     | IPB403                                             | IPB405                                            | IPB402     | IPB402     |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|----------------------------------------------------|---------------------------------------------------|------------|------------|
| Laboratory Report           | Chemtest                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Chemtest   | Chemtest                                           | Chemtest                                          | Chemtest   | Chemtest   |
| Sample Type                 | 22-18586                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 22-18586   | 22-18586                                           | 22-18586                                          | 22-18586   | 22-18586   |
| Sample Depth                | Soil                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Soil       | Soil                                               | Soil                                              | Soil       | Soil       |
| Sample Date                 | 0.0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.2        | 1.2                                                | 0.8                                               | 2.0        | 0.0        |
|                             | 16/05/2022                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 16/05/2022 | 16/05/2022                                         | 16/05/2022                                        | 16/05/2022 | 16/05/2022 |
| Parameters                  | Units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | LOD        | LQM/CIH S4ul for HRA Residential Threshold (mg/kg) | LQM/CIH S4ul for HRA Commercial Threshold (mg/kg) |            |            |
| <b>Metals</b>               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                                                    |                                                   |            |            |
| Antimony                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2          | rv                                                 | rv                                                | rv         | rv         |
| Arsenic                     | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5        | 20                                                 | 640                                               | 1.3        | 8          |
| Barium                      | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0          | rv                                                 | rv                                                | 4.5        | 4          |
| Beryllium                   | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5        | 1.3                                                | 12                                                | rv         | 35         |
| Cadmium                     | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 85                                                 | 180                                               | 1.8        | 1.3        |
| Chromium                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5        | 810                                                | 8,600                                             | 12         | 5.7        |
| Copper                      | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5        | 1,100                                              | 58,000                                            | 31         | 17         |
| Lead                        | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5        | rv                                                 | rv                                                | 21         | 10         |
| Manganese                   | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | 780        |
| Mercury                     | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.05       | 1.2                                                | rv (25.8)                                         | 0.01       | 0.05       |
| Molybdenum                  | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5        | rv                                                 | rv                                                | 1.7        | 1.5        |
| Nickel                      | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5        | 180                                                | rv                                                | 32         | 21         |
| Selenium                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.25       | 53                                                 | 12,000                                            | 1.4        | 1.5        |
| Vanadium                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5        | rv                                                 | rv                                                | rv         | 5.4        |
| Zinc                        | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5        | 4,000                                              | 730,000                                           | 75         | rv         |
| <b>PAHs</b>                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                                                    |                                                   |            |            |
| Naphthalene                 | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 2.3                                                | 160(78.4)sol                                      | 0.19       | 0.12       |
| Acenaphthylene              | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 170                                                | 13000(88.1)sol                                    | 0.045      | 0.053      |
| Acenaphthene                | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 210                                                | 84000(57.0)                                       | 0.086      | 0.071      |
| Fluorene                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 170                                                | 63000(30.6)sol                                    | 0.03       | 0.05       |
| Phenanthrene                | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 95                                                 | 22,000                                            | 0.088      | 0.13       |
| Anthracene                  | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 1,400                                              | 520,000                                           | 0.025      | 0.058      |
| Fluoranthene                | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 180                                                | 23,000                                            | 0.17       | 0.23       |
| Pyrene                      | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 820                                                | 54,000                                            | 0.16       | 0.2        |
| Benzo(a)anthracene          | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 7.2                                                | 170                                               | 0.073      | 0.16       |
| Chrysene                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 15                                                 | 350                                               | 0.072      | 0.1        |
| Benzo(b)fluoranthene        | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 2.8                                                | 44                                                | 0.12       | 0.16       |
| Benzo(k)fluoranthene        | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 77                                                 | 1,200                                             | 0.042      | 0.1        |
| Benzo(a)pyrene              | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 2.2                                                | 35                                                | 0.073      | 0.11       |
| Indeno(1,2,3-cd)pyrene      | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | rv                                                 | 500                                               | 0.071      | 0.085      |
| Dibenzo(a,h)anthracene      | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 0.24                                               | 4                                                 | 0.054      | 0.015      |
| Benzo(g,h,i)perylene        | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | 320                                                | 3,900                                             | 0.088      | 0.2        |
| Coronene                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.01       | rv                                                 | rv                                                | rv         | rv         |
| PAH 18 Total                | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.2        | rv                                                 | rv                                                | 1.9        | 0.24       |
| PAH 17 Total                | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.2        | rv                                                 | rv                                                | 1.4        | rv         |
| Mineral Oil (C10-C40)       | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 10         | rv                                                 | rv                                                | rv         | rv         |
| <b>TPH CWS</b>              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                                                    |                                                   |            |            |
| Aliphatics                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                                                    |                                                   |            |            |
| >C5-C8                      | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 42                                                 | 3,200 (304) sol                                   | rv         | rv         |
| >C8-C10                     | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 186                                                | 7,800 (144) sol                                   | rv         | rv         |
| >C10-C12                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 27                                                 | 2,000 (78) sol                                    | rv         | rv         |
| >C12-C16                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 150                                                | 9,700 (48) sol                                    | rv         | rv         |
| >C16-C21                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 100                                                | 56,000 (combined)                                 | rv         | rv         |
| >C21-C35                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 65,000                                             | 1,600,000                                         | rv         | rv         |
| >C35-C44                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 65,000                                             | 1,600,000                                         | rv         | rv         |
| Total aliphatics C5-44      | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| Aromatics                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |            |                                                    |                                                   |            |            |
| >C5-EC7                     | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 370                                                | 26,000(1220)sol                                   | rv         | rv         |
| >EC7-EC8                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 306                                                | 56,000(889)vap                                    | rv         | rv         |
| >EC8-EC10                   | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 47                                                 | 3,500(613)vap                                     | rv         | rv         |
| >EC10-EC12                  | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 250                                                | 16,000(364)sol                                    | rv         | rv         |
| >EC12-EC18                  | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 1800                                               | 38,000(180)sol                                    | rv         | rv         |
| >EC18-EC21                  | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 1800                                               | 29,000                                            | rv         | rv         |
| >EC21-EC35                  | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 1800                                               | 29,000                                            | rv         | rv         |
| >EC35-EC44                  | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 1800                                               | 29,000                                            | rv         | rv         |
| Total aromatics C5-40       | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| Methyl Tertiary Butyl Ether | ug/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| Benzene                     | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.001      | 0.38                                               | 27                                                | rv         | rv         |
| Toluene                     | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.001      | 880(869)vap                                        | 56,000(889)vap                                    | rv         | rv         |
| Ethylbenzene                | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.001      | 83                                                 | 3,700(518)vap                                     | rv         | rv         |
| m,p-Xylene                  | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.001      | m: 820<br>p: 760                                   | m: 6,200(825)vap<br>p: 5,600(578)sol              | rv         | rv         |
| o-Xylene                    | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.001      | 88                                                 | 8,600(478)sol                                     | rv         | rv         |
| PCB 28                      | ug/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| PCB 52                      | ug/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| PCB 101                     | ug/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| PCB 118                     | ug/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| PCB 138                     | ug/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| PCB 153                     | ug/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| PCB 180                     | ug/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| Total 7 PCBs                | ug/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | rv         | rv         |
| Phenol                      | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.1        | 750                                                | 780(31,000)dir                                    | rv         | rv         |
| Natural Moisture Content    | %                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.2        | rv                                                 | rv                                                | 10         | 12         |
| Hexavalent Chromium         | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 0.5        | 6                                                  | 33                                                | 12         | 5.7        |
| Chromium (I)                | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | 810                                                | 8,600                                             | 2.8        | 8.8        |
| Total Organic Carbon        | %                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.4        | rv                                                 | rv                                                | 2.2        | 2.9        |
| Organic Matter              | %                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.2        | rv                                                 | rv                                                | 1.7        | 0.85       |
| Total Sulphate              | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 100        | rv                                                 | rv                                                | 1,300      | 720        |
| Elemental Sulphur           | mg/kg                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1          | rv                                                 | rv                                                | 12         | 1.6        |
| pH                          | pH units                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 4          | rv                                                 | rv                                                | 8.5        | 8.5        |
| Asbestos                    | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | N/A        | rv                                                 | rv                                                | NAD        | NAD        |
| Legend                      | <p>9.4 Results exceed LQM/CIH S4ul for HRA Residential Threshold (mg/kg) homegrown produce at 1% SOM (mg/kg)</p> <p>9.4 Results exceed LQM/CIH S4ul for HRA Commercial Threshold at 1% SOM (mg/kg)</p> <p>LOD Laboratory Limit of Detection</p> <p>rv Results below LOD</p> <p>rv Guideline threshold value not available</p> <p>nt Not tested</p>                                                                                                                                                                                                                              |            |                                                    |                                                   |            |            |
| Notes                       | <p>HRA 2015 - LQM/CIH Suite 4 Use Levels based on 'Commercial' and/or 'residential' land use using 1% SOM. Metals are compared against a 6% SOM</p> <p>Soil and S4UL presented exceed the solubility saturation limit, which is presented in brackets</p> <p>Vap - vap S4UL presented exceed the vapour saturation limit which is presented in brackets</p> <p>Dir - dir S4UL based on a threshold protective of direct skin contact with phenol (in brackets, based on health effects following long term exposure for illustration only)</p> <p>NAD Non asbestos detected</p> |            |                                                    |                                                   |            |            |

<sup>28</sup> Source: IGSL, 2022

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| Sample ID                   | Chemical Analysis Results |          |                                                    |                                                   |            |            |
|-----------------------------|---------------------------|----------|----------------------------------------------------|---------------------------------------------------|------------|------------|
| Laboratory Report           | BM03                      | BM03     | BM04                                               | ST04-A                                            | ST04-A     | ST04-C     |
| Sample Type                 | Chemical                  | Chemical | Chemical                                           | Chemical                                          | Chemical   | Chemical   |
| Sample Depth                | 22-18500                  | 22-18835 | 22-18200                                           | 22-18200                                          | 22-18200   | 22-18200   |
| Sample Date                 | 4/5                       | 1/2      | 0/8                                                | 1/2                                               | 0/5        | 0/45       |
| Parameters                  | Units                     | LOD      | LQM/CIH S4ul for HRA Residential Threshold (mg/kg) | LQM/CIH S4ul for HRA Commercial Threshold (mg/kg) | 22/05/2022 | 22/05/2022 |
| Antimony                    | mg/kg                     | 2        | nv                                                 | nv                                                | 2.3        | 1.8        |
| Arsenic                     | mg/kg                     | 0.5      | 40                                                 | 640                                               | 3.9        | 3.4        |
| Barium                      | mg/kg                     | 0        | nv                                                 | nv                                                | 10         | 27         |
| Beryllium                   | mg/kg                     | 0.5      | 1.7                                                | 12                                                | nt         | nt         |
| Cadmium                     | mg/kg                     | 0.1      | 85                                                 | 180                                               | 1.8        | 2.3        |
| Chromium                    | mg/kg                     | 0.5      | 910                                                | 8,600                                             | 4.2        | 8.4        |
| Copper                      | mg/kg                     | 0.5      | 7,100                                              | 68,000                                            | 12         | 19         |
| Lead                        | mg/kg                     | 0.5      | nv                                                 | nv                                                | 4.1        | 13         |
| Manganese                   | mg/kg                     | 1        | nv                                                 | nv                                                | 180        | nt         |
| Mercury                     | mg/kg                     | 0.05     | 1.2                                                | 50 (vap (25.8))                                   | nt         | 240        |
| Nickel                      | mg/kg                     | 0.5      | 180                                                | 880                                               | 4.6        | 4.5        |
| Selenium                    | mg/kg                     | 0.5      | 430                                                | 12,000                                            | 16         | 33         |
| Vanadium                    | mg/kg                     | 0.5      | nv                                                 | nv                                                | 1.4        | 0.86       |
| Zinc                        | mg/kg                     | 0.5      | 40,000                                             | 730,000                                           | 10         | 18         |
| PAHs                        | mg/kg                     | 0.5      | nv                                                 | nv                                                | 50         | 80         |
| Naphthalene                 | mg/kg                     | 0.01     | 2.3                                                | 180 (78.4 µol)                                    | nt         | nt         |
| Acenaphthylene              | mg/kg                     | 0.01     | 170                                                | 8,500 (86.1 µol)                                  | nt         | nt         |
| Acenaphthene                | mg/kg                     | 0.01     | 210                                                | 8,400 (57.0 µol)                                  | nt         | nt         |
| Fluorene                    | mg/kg                     | 0.01     | 170                                                | 6,500 (30.9 µol)                                  | nt         | nt         |
| Phenanthrene                | mg/kg                     | 0.01     | 95                                                 | 22,000                                            | nt         | nt         |
| Anthracene                  | mg/kg                     | 0.01     | 2,400                                              | 520,000                                           | nt         | nt         |
| Fluoranthene                | mg/kg                     | 0.01     | 280                                                | 23,000                                            | 0.27       | nt         |
| Pyrene                      | mg/kg                     | 0.01     | 620                                                | 54,000                                            | 0.31       | nt         |
| Benzo(a)anthracene          | mg/kg                     | 0.01     | 7.2                                                | 70                                                | nt         | nt         |
| Chrysene                    | mg/kg                     | 0.01     | 15                                                 | 150                                               | nt         | nt         |
| Benzo(b)fluoranthene        | mg/kg                     | 0.01     | 2.6                                                | 44                                                | nt         | nt         |
| Benzo(k)fluoranthene        | mg/kg                     | 0.01     | 77                                                 | 200                                               | nt         | nt         |
| Benzo(a)pyrene              | mg/kg                     | 0.01     | 2.2                                                | 35                                                | nt         | nt         |
| Indeno(1,2,3-cd)pyrene      | mg/kg                     | 0.01     | nv                                                 | 180                                               | nt         | nt         |
| Dibenz(a,h)anthracene       | mg/kg                     | 0.01     | 0.24                                               | 4                                                 | nt         | nt         |
| Benzo(ghi)perylene          | mg/kg                     | 0.01     | 320                                                | 1,800                                             | nt         | nt         |
| Coronene                    | mg/kg                     | 0.01     | nv                                                 | nv                                                | nt         | nt         |
| PAH 16 Total                | mg/kg                     | 0.2      | nv                                                 | nv                                                | nt         | nt         |
| PAH 17 Total                | mg/kg                     | 0.2      | nv                                                 | nv                                                | nt         | nt         |
| Mineral Oil (C10-C40)       | mg/kg                     | 0.1      | nv                                                 | nv                                                | nt         | nt         |
| TPP-CWQ                     | mg/kg                     | 0.1      | nv                                                 | nv                                                | nt         | nt         |
| Aliphatics                  | mg/kg                     | 0.1      | nv                                                 | nv                                                | nt         | nt         |
| >C5-C6                      | mg/kg                     | 0.1      | 40                                                 | 1,200 (304.1 µol)                                 | nt         | nt         |
| >C6-C8                      | mg/kg                     | 0.1      | 100                                                | 7,800 (144.9 µol)                                 | nt         | nt         |
| >C8-C10                     | mg/kg                     | 0.1      | 27                                                 | 2,000 (78.4 µol)                                  | nt         | nt         |
| >C10-C12                    | mg/kg                     | 0.1      | 130                                                | 9,700 (145.9 µol)                                 | nt         | nt         |
| >C12-C16                    | mg/kg                     | 0.1      | 1,100                                              | 58,000 (24.9 µol)                                 | nt         | nt         |
| >C16-C21                    | mg/kg                     | 0.1      | 65,000 (combined)                                  | 800,000 (combined)                                | nt         | nt         |
| >C21-C35                    | mg/kg                     | 0.1      | 65,000                                             | 800,000                                           | nt         | nt         |
| >C35-C44                    | mg/kg                     | 0.1      | 65,000                                             | 800,000                                           | nt         | nt         |
| Total aliphatics C5-C44     | mg/kg                     | 0.1      | nv                                                 | nv                                                | nt         | nt         |
| Aromatics                   | mg/kg                     | 0.1      | nv                                                 | nv                                                | nt         | nt         |
| >C5-EC7                     | mg/kg                     | 0.1      | 370                                                | 20,000 (12.9 µol)                                 | nt         | nt         |
| >EC7-EC8                    | mg/kg                     | 0.1      | 880                                                | 54,000 (89.9 µol)                                 | nt         | nt         |
| >EC8-EC10                   | mg/kg                     | 0.1      | 47                                                 | 3,500 (51.3 µol)                                  | nt         | nt         |
| >EC10-EC12                  | mg/kg                     | 0.1      | 250                                                | 18,000 (38.4 µol)                                 | nt         | nt         |
| >EC12-EC16                  | mg/kg                     | 0.1      | 1800                                               | 38,000 (18.9 µol)                                 | nt         | nt         |
| >EC16-EC21                  | mg/kg                     | 0.1      | 1800                                               | 26,000                                            | nt         | nt         |
| >EC21-EC35                  | mg/kg                     | 0.1      | 1800                                               | 28,000                                            | nt         | nt         |
| >EC35-EC44                  | mg/kg                     | 0.1      | 1800                                               | 28,000                                            | nt         | nt         |
| Total aromatics C5-40       | mg/kg                     | 0.1      | nv                                                 | nv                                                | nt         | nt         |
| Methyl Tertiary Butyl Ether | mg/kg                     | 0.001    | nv                                                 | nv                                                | nt         | nt         |
| Benzene                     | mg/kg                     | 0.001    | 0.38                                               | 27                                                | nt         | nt         |
| Toluene                     | mg/kg                     | 0.001    | 880 (880 µg)                                       | 54,000 (89.9 µg)                                  | nt         | nt         |
| Ethylbenzene                | mg/kg                     | 0.001    | 83                                                 | 5,700 (518 µg)                                    | nt         | nt         |
| m,p-Xylene                  | mg/kg                     | 0.001    | nt 620                                             | nt 6,200 (625 µg)                                 | nt         | nt         |
| o-Xylene                    | mg/kg                     | 0.001    | p 790                                              | p 5,800 (578 µg)                                  | nt         | nt         |
| PCB 28                      | ug/kg                     | 1        | nv                                                 | nv                                                | nt         | nt         |
| PCB 52                      | ug/kg                     | 1        | nv                                                 | nv                                                | nt         | nt         |
| PCB 101                     | ug/kg                     | 1        | nv                                                 | nv                                                | nt         | nt         |
| PCB 118                     | ug/kg                     | 1        | nv                                                 | nv                                                | nt         | nt         |
| PCB 138                     | ug/kg                     | 1        | nv                                                 | nv                                                | nt         | nt         |
| PCB 153                     | ug/kg                     | 1        | nv                                                 | nv                                                | nt         | nt         |
| PCB 180                     | ug/kg                     | 1        | nv                                                 | nv                                                | nt         | nt         |
| Total 7 PCBs                | ug/kg                     | 1        | nv                                                 | nv                                                | nt         | nt         |
| Phenol                      | mg/kg                     | 0.1      | 780                                                | 180 (31,000 µg)                                   | nt         | nt         |
| Natural Moisture Content    | %                         | 0.2      | nv                                                 | nv                                                | 12         | 12         |
| Hexachlorobenzene           | mg/kg                     | 0.5      | 6                                                  | 33                                                | 12         | 12         |
| Chromium (II)               | mg/kg                     | 1        | 910                                                | 8,600                                             | 4.2        | 8.4        |
| Total Organic Carbon        | %                         | 0.4      | nv                                                 | nv                                                | 1.1        | 1.8        |
| Organic Matter              | %                         | 0.2      | nv                                                 | nv                                                | 1.8        | 2.8        |
| Total Sulphate              | mg/kg                     | 100      | nv                                                 | nv                                                | 4,000      | 860        |
| Elemental Sulphur           | mg/kg                     | 1        | nv                                                 | nv                                                | nt         | 2          |
| pH                          | pH units                  | 4        | nv                                                 | nv                                                | 8.8        | 8.2        |
| Asbestos                    | N/A                       | N/A      | nv                                                 | nv                                                | NAD        | NAD        |

According to the laboratory reports (refer to IGSL Site Investigation report), from the resultant testing, all except two samples can be classified as inert as per the 2002 European Landfill Directive (2003/33/EC). The exception were samples from BH02 at 6.0 m and ST06-A at 1.20 m. The soil specimen from BH02 was noted to contain hazardous quantities of Total Organic Carbon [TOC]. The sample would therefore not be accepted by an inert landfill due to its TOC content but should instead be dealt with by a suitably licensed waste facilitator.

### 7.3.15 ECONOMIC GEOLOGY

The EPA Extractive Industry Register and the GSI mineral database were consulted to determine whether there were/ are any mineral sites close to the subject site. There are no active quarries, historical mines at or adjacent to the proposed development site.

### 7.3.16 GEOLOGICAL HERITAGE

The GSI Public Viewer ([www.gsi.ie/mapping](http://www.gsi.ie/mapping)) was reviewed to identify sites of geological heritage for the site and surrounding area. The Louisa Bridge Cold Spring (Site Code KE016) is the closest audited site and is located adjacent to the projected T5. This site is described as a cold spring associated with a warm spring formerly used as a spa. The cold spring is characterised by a generally low flow rate, with long periods during the summer when there is no flow

### 7.3.17 RADON

According to the EPA (now incorporating the Radiological Protection Institute of Ireland) the site location is a Moderate Radon Area where it is estimated that between five and ten percent per cent of the homes in this 10 km grid square are estimated to be above the Reference Level. This is the third highest of the five radon categories which are assessed by the EPA.

### 7.3.18 GEOHAZARDS

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating slope failure. Instability is often significantly increased by man's activities in building houses, roads, drainage and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a result. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff and leads to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. The GSI landslide database was consulted and there are no recorded landslide in the vicinity of the proposed development. Due to the local topography and the underlying strata there is a negligible risk of a landslide event occurring at the site.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently there are five permanent broadband seismic recording stations in Ireland and operated by DIAS. The seismic data from the stations comes into DIAS in real-time, and are studied for local and regional events. Records since 1980 show that the nearest seismic activity to the proposed location was in the Irish sea (1.0 – 2.0 Ml magnitude) and ~55 km to the south in the Wicklow Mountains. There is a very low risk of seismic activity to the proposed development site.

There are no active volcanoes in Ireland so there is no risk from volcanic activity.

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### 7.3.19 IDENTIFICATION OF WATER ENVIRONMENT RECEPTORS

The following potential receptors have been identified in the vicinity of the site. The Water Environment receptors are:

- Groundwater in the underlying bedrock aquifer beneath the site;
- Rye Water Valley/Carton SAC: The OHL diversion runs in close proximity to the Rye Water Valley/Carton SAC which stretches along either side of the River Rye from the Carton Estate to the Leixlip Spa;
- The Louisa Spring boundary is located adjacent to the projected T5.
- The Royal Canal to the south of the proposed works. As this is fully lined, it is not considered a receptor of consequence.

#### 7.3.19.1 The Rye Water

Rye Water Valley/Carton SAC (Site Code 001398) is located between Leixlip and Maynooth, in Counties Meath and Kildare, and extends along the Rye Water, a tributary of the River Liffey. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive:

- Petrifying Springs
- Narrow-mouthed Whorl Snail (*Vertigo angustior*)
- Desmoulin's Whorl Snail (*Vertigo moulinsiana*)

The Rye Water and the habitat is described in more detail within the Biodiversity Chapter 6.

In this area, the Rye Water would flow over granular/ alluvial deposits which in turn overlie limestones. Groundwater is probably providing baseflow through discharge through gravels and discharge from fractured bedrock. Measurement of groundwater levels above the top of the limestone bedrock indicates that an upward groundwater gradient is present within the bedrock in places.

Downgradient of this area of the proposed dewatering for the manufacturing buildings and AWN structures, surface water run-off or recent recharge (shallow groundwater flow) has a more significant impact on the river flow rather than throughput from groundwater within the bedrock aquifer (refer to Conceptual Model in Section 7.3.20).

#### 7.3.19.2 Louisa Bridge Petrifying Springs

The Leixlip Spa includes the Louisa Bridge petrifying springs with a tufa formation on the southern bank of the Rye Water. The Louisa spring is located within the Leixlip Spa boundary, which is adjacent to the east of the projected T5 tower.

The Hydro-G Hydrogeological<sup>M</sup> report for Leixlip Spa identifies the two sources of groundwater at the Spa. The main source of water comes from a deeper, older and warmer groundwater system, discharging at the top of the first terrace through the Spa Well. The second is a more recent, shallow groundwater that flows through shallower limestone bedrock with the main groundwater discharge located in the vicinity of the fen wetland habitat ('filtering ponds') at the most elevated, southern terrace and at a similar horizon on surrounding drainage. The tufa is deposited as water saturated with calcium carbonate releases carbon dioxide resulting in natural deposition of tufa along a natural terrace paralleling the Rye Water River.

The report identifies that within the SAC boundary, five terraces were identified, whose topography steeply dips in a northern direction. This distinct topography controls water flows within the Leixlip Spa site, which, due to the cascading nature of the bedrock, tends to overflow from one terrace to another or seep from the bedrock and through the relatively shallow soil. Therefore, deeper warm water discharging from the Spa Well drains northwards and flows into and through the shallow system, resulting in water being mixed with more recently recharged water.

The proposed towers will not have significant soil excavation or dewatering required during construction. During construction, measures will be included in the Outline CEMP to ensure that all construction run-off will be controlled i.e. not allowed to run outside of the work areas.

The groundwater flow direction at the proposed excavation areas is towards the north/north-east in the direction of the Rye Water rather than eastward towards the Louisa Springs. There is no evidence from extensive site drilling of any bedrock fracturing which suggests significant fracture zones beneath the tower sites. The competent limestone encountered beneath the site does not show evidence of karstification and no fissures are noted in any of the bedrock boreholes at the site. The rotary core logs for the competent limestone indicate that the only fractures encountered are discrete sets present in the competent bedrock. These discontinuities, if connected, could represent minor localised flow paths in the competent bedrock underlying the construction site.

The Hydro-G report states that analysis of water quality within the Leixlip Spa site and a water sample taken from a drainage ditch located at the western boundary of the 1st terrace showed a different hydro-chemical signature in the drainage ditch than in all other samples from the Leixlip Spa site, suggesting different water origin. The two springs belong to separate groundwater systems: a deeper system represented by the warm spring and a shallow system, dependent on more recent recharge and flowing through the upper limestone aquifer, represented by the cold spring.

### 7.3.19.3 The Royal Canal

The Royal Canal is located to the south of the proposed works, it is upgradient in terms of groundwater flow direction and is lined.

The Royal Canal links the River Liffey in Dublin to the River Shannon stretching 146 km with 46 locks, 10 of them double-chambered. The Royal Canal is a pNHA with its main water supply from Lough Owel (also a SAC) via a feeder channel into the canal at Mullingar.

There is no hydrogeological linkage between the area of the proposed tower areas and the Canal.

## 7.3.20 CONCEPTUAL SITE MODEL

Local cross sections for the projected tower locations are presented below in Figure 7.15 and Figure 7.16. These cross sections and the description below present the Conceptual Site Model (CSM). The CSM was developed in order to identify any likely Source-Pathway-Receptor linkages relating to the site and the proposed works. The summary of the current CSM for the proposed development is as follows:

### 7.3.20.1 Towers 1 (Lidl carpark), 2 and 3 (Intel Campus):

- Bedrock is overlain by slightly gravelly Clay which in turn is overlain by Made Ground. Vulnerability in this zone is 'Low' to 'Moderate'. In terms of potential pathways, there is low risk of vertical migration to the poorly connected fracturing within the Limestone. The overburden thickness, low permeability nature of tills and a lack of fracture connectivity within the limestone will minimise the rate of off-site migration for any indirect potential discharges to ground at these sites. Tower depths are projected into the overburden.
- Based on the hydraulic characteristics of the limestone and the groundwater flow direction there is no likely influence during construction of these towers on the Rye Water SAC or the Louisa Spring Complex as there is no likely hydraulic continuity between the tower areas and these protected sites.

### 7.3.20.2 Towers 4 and 5 (Grasslands)

- Bedrock is overlain by granular deposits (clayey sandy Gravel) which in turn are overlain by cohesive deposits (slightly gravelly Clay) and top soil. Section A-A' below shows a significant slope and variation in overburden cover going from south to north through the T4-T5 direction.
- Tower 4 area has a 'High' vulnerability as overburden was mainly described as granular deposits. Protected tower depth is projected into the granular deposit. In terms of potential

pathways, there is low risk of vertical migration given the lack of fracture connectivity within the rock will minimise any potential rate of off-site migration for any indirect potential discharges to ground at this site.

- Tower 5 area has a 'Low' vulnerability. Protected tower depth is projected into the granular deposit. In terms of potential pathways, there is low risk of vertical migration from the site to the Leixlip Spa or SAC boundary through the poorly connected fracturing within the Limestone. The overburden thickness, low permeability nature of tills and a lack of fracture connectivity within the limestone will minimise the rate of off-site migration for any indirect potential discharges to ground at T5. Given the projected depth of the tower, there will not be hydrogeological connection between the T5 works area and Rye Water SAC and Leixlip Spa.
- Therefore, based on the hydraulic characteristics of the limestone and the groundwater flow direction there is no likely influence during construction of these towers on the Rye Water SAC or the Louisa Spring Complex as there is no likely hydraulic continuity between the tower areas and these protected sites.

### 7.3.20.3 Tower 6

- Tower 6 area presents an 'Extreme' Vulnerability given the shallow depth of bedrock (2.0 mbgl). However, bedrock is overlain by low permeability cohesive deposits.
- No granular deposits were encountered at this area. Therefore, it can be expected to find perched groundwater within the soil overburden specially at depths close to the weathered bedrock.
- Tower 6 depth is projected at a level of 2.8 mbgl. Therefore, some bedrock excavation and exposure is expected. However, the rock mass is characterised by discrete fracturing with little connectivity between fractures resulting in low inflow rates.
- Hence, some dewatering can be expected in the T6 area during the excavation works. This dewatering will have a temporary local effect (<2 months) on the groundwater regime in the immediate vicinity of the planned excavation works. There is no mid-term or long-term effect once dewatering has ceased. Based on the hydraulic characteristics of the limestone and the groundwater flow direction there is no likely influence during works on this tower and the Louisa Spring Complex.

### 7.3.20.4 Tower 7

- At this location there is negligible connectivity between the projected excavation area and the Rye Water; there is low risk of vertical migration given the lack of fracture connectivity within the rock will minimise any potential rate of off-site migration for any indirect potential discharges to ground at this site.

### 7.3.20.5 General

- Bedrock has been recorded as dark grey fine-grained Limestone with occasional shaley bands (Calp). Permeability values for the Limestone bedrock from are generally low 0.001 m/day to a maximum of 0.247 m/day.
- Groundwater flow direction reflects the local topographical setting. Therefore, the groundwater flow is expected to be towards the River Rye Water. Regionally, groundwater would flow towards the River Liffey. This local and regional flow pattern conforms with the flow regime described in the Geological Survey of Ireland (GSI) characterisation of the Dublin Groundwater Body. *"The general groundwater flow direction in this aquifer is towards the coast and also towards the River Liffey and Dublin City. This aquifer is not expected to maintain regional groundwater flow paths. Groundwater circulation from recharge to discharge points will more commonly take place over a distance of less than a kilometre"*.
- The principal sensitive receptor in the area is the underlying bedrock aquifer in the area which is a *locally important* aquifer, the Rye Water SAC, a protected surface water and groundwater dependent ecosystem which includes Louisa Spring complex (a groundwater dependent ecosystem). The natural groundwater and surface water regime which supports the spring/seepage will be unchanged by the proposed development. No significant soil excavation, dewatering or disturbance of natural drainage is required as part of the projected works.

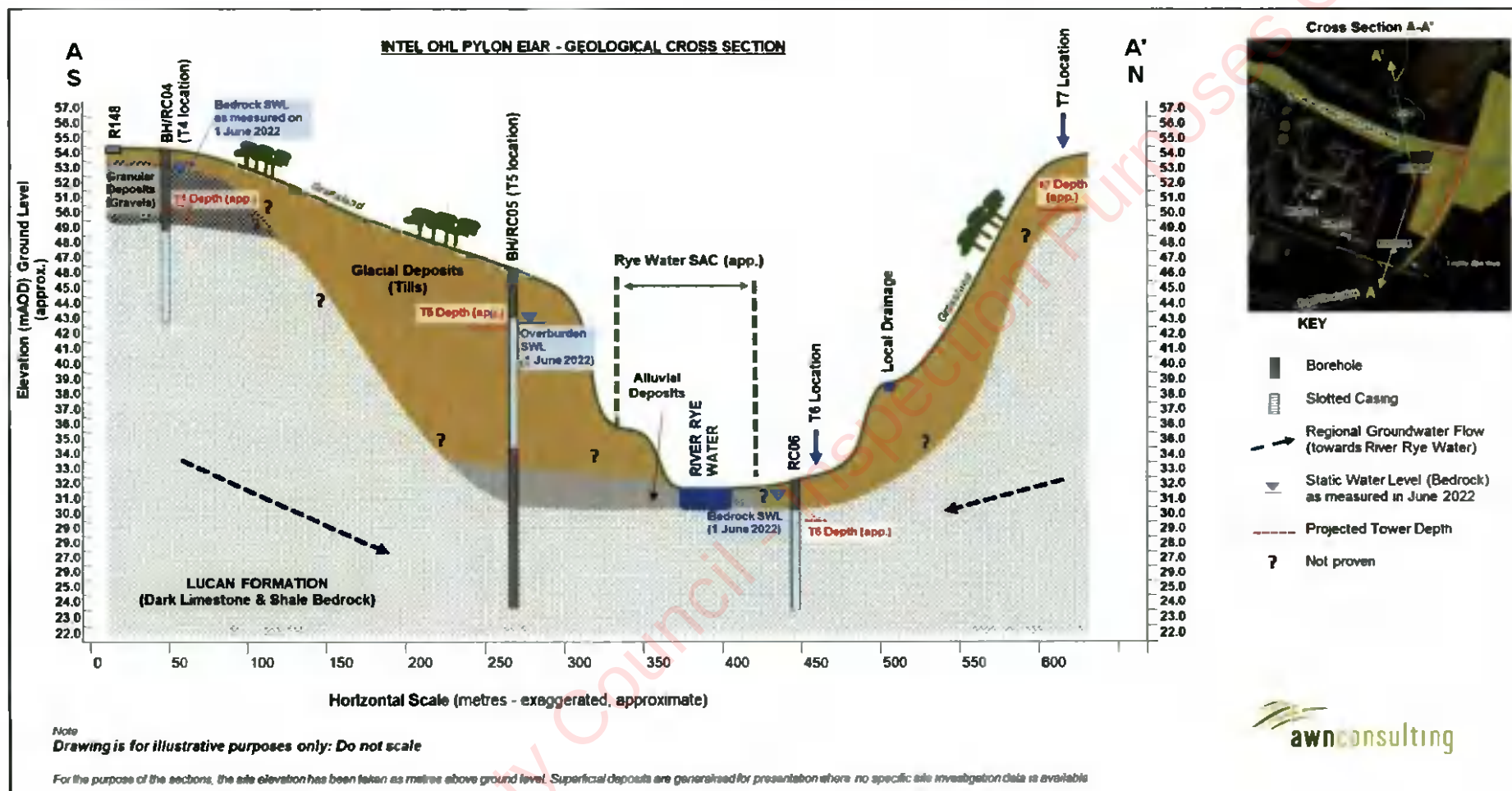


Figure 7.15 Local Cross Section A-A'

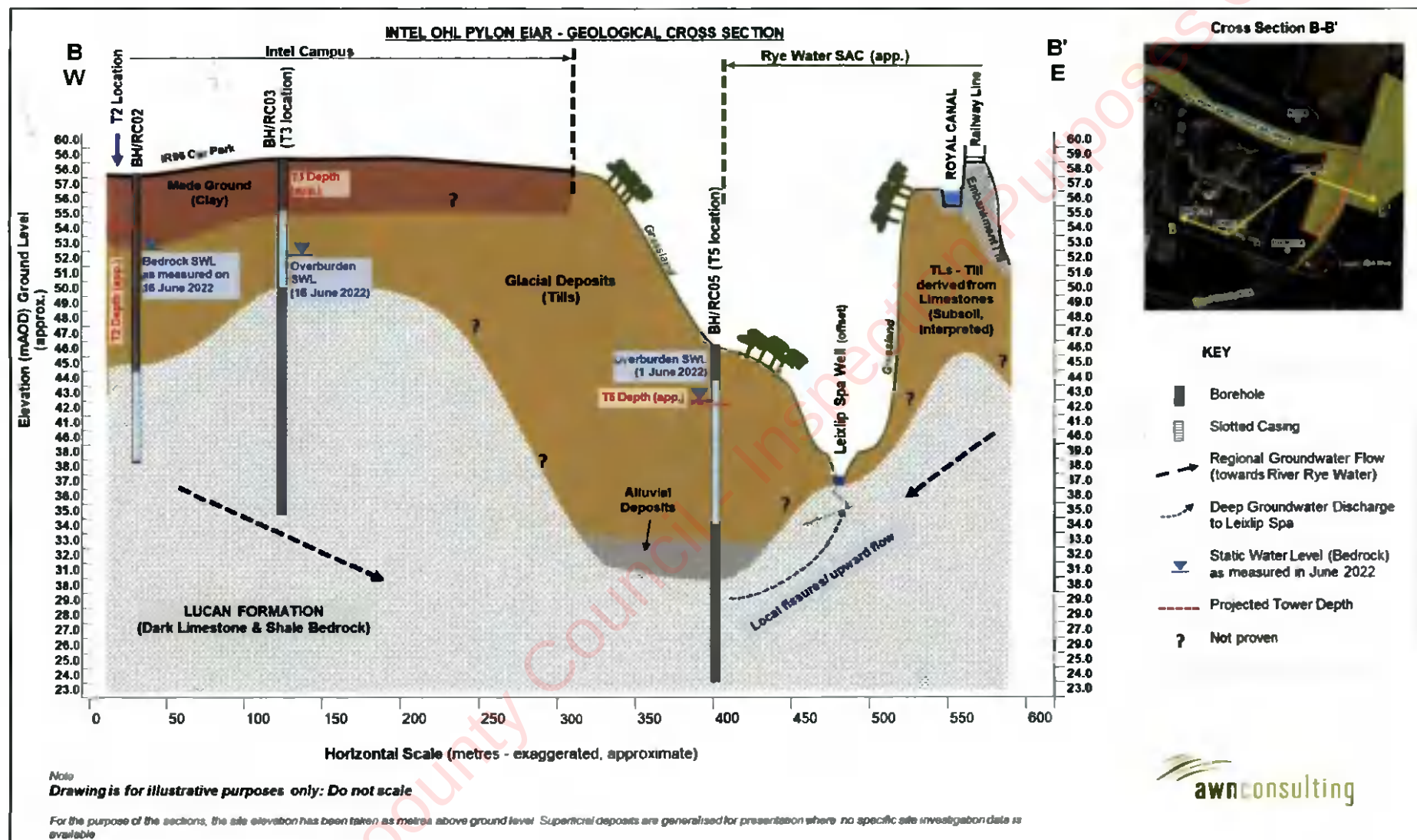


Figure 7.16 Local Cross Section B-B'

### 7.3.21 RATING OF IMPORTANCE OF GEOLOGICAL AND HYDROGEOLOGICAL ATTRIBUTES

Based on the TII methodology (2009) (See Appendix 7.1), and criteria for rating site importance of hydrogeological features, the importance of the hydrogeological features at this site is rated as "Extremely High" based on the fact that the bedrock underlying the site is a Locally Important aquifer and hosts a groundwater dependent ecosystem (SAC). As such, extensive assessment has been undertaken to assess predicted impacts of the proposed development to ensure the construction and operation of the proposed development will not impact the aquifer or SAC.

## 7.4 PREDICTED EFFECTS

An analysis of the potential effects of the proposed development on the land, soils, geology and hydrogeological environment during the construction and operation is outlined below. Due to the inter-relationship between soils, geology and hydrogeology and surface water (Hydrology) the following impacts discussed will be considered applicable to both Chapter 6 *Biodiversity* and 8 *Water & Hydrology* of the EIAR. Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in Section 7.5 below.

### 7.4.1 CONSTRUCTION PHASE

In the absence of mitigation, the following potential effects to land, soil and groundwater (hydrogeology) have been considered for the construction phase.

#### 7.4.1.1 Dewatering

It is expected that dewatering will be required during the excavation of T6 tower which location lies close to the Rye River in a relatively low-lying area. There may be some connectivity between the groundwater regime in the area of Tower 6 and the level of the nearby Rye Water River. The projected depth of the tower is 2.8 m and its surface area 2.8 m x 4.0 m.

The shallow and bedrock groundwater regime local to the Rye Water SAC will be unchanged during construction. There will be a temporary local impact around the excavation area due to required dewatering. However, given the size of the excavation projected and the presence of cohesive deposits over the bedrock, no impact on water levels or flow in the river is expected from the localised temporary groundwater dewatering during construction. Post construction, the natural groundwater regime will quickly return to normal.

No significant dewatering is expected in the other towers, with the exception of T4 whose location overlies granular deposit. Any water in the excavation will be pumped out prior to any concrete being poured into the foundation. If groundwater is encountered, it will be pumped into IBC tanks or a vacuum truck used for dewatering and removed offsite to an approved facility.

The temporary impact during construction caused by the proposed dewatering will have no effect on the complex of springs and seepages at Louisa Bride, as it will not impact on the deep or shallow groundwater feeding these springs. The shallow groundwater at the proposed excavation and Louisa Spring are not in hydraulic continuity and the groundwater flow directions differ.

It can be expected to encounter minor ingress of rainfall in the excavation during the construction phase.

In the absence of mitigation, the effect on the local and regional environment is likely to be **temporary, slight and negative**.

#### 7.4.1.2 Soil and Bedrock Removal

According to the Site Investigations carried out by IGSL in 2022, the risk of contaminated soils being present on site is low and this was confirmed by onsite soil sampling and analysis. Nonetheless

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Planning Department

28 NOV 2022

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material, which is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments.

At the depths below ground at which foundation bases are installed, various types of soil, gravelly soil, and rock will be excavated. All topsoil excavated in the construction of tower foundations will be reinstated where possible, on completion of the proposed works. Where practical and appropriate, excavated subsoil will be used for associated construction and landscaping purposes.

All surplus waste arising during the construction phase will be managed and disposed of to a licensed landfill. This ensures compliance with the provisions of the Waste Management Act 1996 (as amended) and the extant Eastern Midlands Region Waste Management Plan (2015-2021). A Construction Waste Management Plan will be implemented to minimise waste and ensure correct handling and disposal of construction waste streams in accordance with the "Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects" (Environmental Protection Agency, 2021).

The approximate quantity of soil to be stockpiled is c. 1,320 m<sup>3</sup> and the quantity of soil to be taken off site for each tower is c. 740 m<sup>3</sup>. The maximum excavation level would be c. 4 mbgl (T1, T2, T4, T5 & T7). Therefore, it is very unlikely that bedrock could be exposed due to planned earthworks with the exception of T6 where a temporary exposition is expected as bedrock was encountered at 2.0 mbgl and the projected foundation depth in 2.8 mbgl. The projected depth at T3 is also 2.8 mbgl.

Site investigation and laboratory analysis has not identified any existing contamination. However, if contaminated soil/water is encountered, it will be required to be removed by a licensed waste contractor.

In the absence of mitigation, the effect on the local and regional environment is likely to be **temporary, slight and negative**.

#### 7.4.1.3 Accidental Spills and Leaks

As with all construction projects there is potential for water (rainfall and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant temporary risk to groundwater and surface water quality for the duration of the construction if contaminated water is allowed percolate to the aquifer or be discharged into a surface water receptor (Rye Water SAC).

During construction of the development, there is a risk of accidental pollution incidences from the following sources:

- Suspended solids (muddy water with increase turbidity) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.

Accidental spillages which are not mitigated may result in localised contamination of soils and groundwater underlying the site, should contaminants migrate through the subsoil's and impact the underlying groundwater. Any soil stripping will also further reduce the thickness of subsoil and the natural protection they provide to the underlying aquifer; however, bedrock is assumed to be below the maximum projected excavation depths, with the exception of T6 as explained above.

In the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, slight and negative**.

## 7.4.2 OPERATIONAL PHASE

There will be a minimal decrease in recharge area (c. 96.8 m<sup>2</sup>) associated with the foundations surface area. Once these are installed into the overburden, there could be a minimal cut of the shallow horizontal recharge/ groundwater flow. However, this will not affect the regional water table within bedrock will or the hydrological/ hydrogeological regime of the water environmental receptors (Rye Water SAC and Leixlip Spa). This will have a minor effect on local recharge to ground; however, the impact on the overall hydrological regime will be imperceptible.

In the absence of mitigation, the effect on the geological and hydrogeological environment is likely to be **long-term, imperceptible and negative**.

## 7.4.3 DO NOTHING SCENARIO

If the proposed development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no, excavation or erection of towers at these sites. There would, therefore, be a neutral effect on the geological and hydrogeological environment in terms of waste.

## 7.5 MITIGATION AND MONITORING MEASURES

The design has taken account of the potential impacts of the development on the soils, geology and hydrogeology environment local to the area where construction is taking place and containment of contaminant sources during operation. Control environmental measures have been incorporated in the design to mitigate the potential effects on the surrounding soils, geology and hydrogeology (refer to Section 7.2.2 above). These are described below.

Due to the inter-relationship between soils, geology, hydrogeology, hydrology and biodiversity, the following mitigation measures discussed will be considered applicable to all. Waste Management is also considered an interaction in some sections.

### 7.5.1 CONSTRUCTION PHASE

In order to reduce impacts on the soils and geology environment, a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:

- Control of soil excavation/ infill and export from site;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

#### 7.5.1.1 Construction Environmental Management Plan (CEMP)

In advance of work starting on site, the works Contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The detailed CEMP will set out the overarching vision of how the construction of the proposed development will be managed in a safe and organised manner by the Contractor. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent planning conditions relevant to the proposed development.

As a minimum, the CEMP will be formulated in accordance with best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532) Construction Industry Research and Information Association;
- CIRIA (2002) Control of water pollution from construction sites: guidance for consultants and contractors (SPI56) Construction Industry Research and Information Association

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28 NOV 2022  
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- CIRIA (2005), Environmental Good Practice on Site (C650); Construction Industry Research and Information Association
- BPGCS005, Oil Storage Guidelines;
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- CIRIA 697, The SUDS Manual, 2007; and
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.

In order to reduce impacts on the soil, geological and hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on site as outlined below.

#### 7.5.1.2 Control of Soil Excavation

Site preparation, clearance, levelling, construction of foundations, and access roads will require the excavation c. 2,060m<sup>3</sup> of soil. All topsoil excavated in the construction of tower foundations will be reinstated where possible, on completion of the proposed works. Where practical and appropriate, excavated subsoil will be used for associated construction and landscaping purposes.

According to onsite investigations, the bedrock vulnerability varies from 'Low' to 'Extreme' (T6) along the projected line throughout the site. Removal and reinstatement of subsoil cover will not alter the vulnerability category of the underlying bedrock. The deposition of compacted soil would increase the overburden thickness and thus may even decrease the groundwater vulnerability.

Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any open surface water drains. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust. The tower foundations will be backfilled one leg at a time with the excavated material. The backfill is placed and compacted in layers. When the base construction crew leave the site, they will ensure the removal of all surplus materials from the site, including all unused excavated fill.

Measures to minimise the suspension and mobilisation of sediment downstream of the working area should consider silt barriers and coffer damming to create dry working areas.

To avoid excessive silt runoff, site clearance is not to be undertaken during wet conditions, when rainfall of more than 0.5 mm/hour is forecast within the next 24 hours or rainfall of more than 3mm/hour is forecast within the next five days in the Leixlip area. At the riverbank works locations, silt fencing will be installed along the river bank to retain eroded sediments. Catch nets will be used where relevant.

Soil cleared from the site and all materials associated with the building process are to be stored outside the flood zone in designated storage areas. The flood zone will be delineated on the works areas. No soil storing will be allowed within 30 m of the open water, which is in line with the Inland Fisheries Ireland guidelines

Although there is no evidence of historical contamination in the proposed development area, all excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Site investigations classified the subsoils as mostly 'inert' as presented in Section 7.3.14 above. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be disposed of by a licensed waste disposal contractor.

Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated against through the implementation of appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the boundary of the site and there will be no direct link or pathway from this area to any

surface water body. Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible.

Dust suppression measures (e.g., damping down during dry periods), vehicle wheel washes, road sweeping, and general housekeeping will ensure that the surrounding environment are free of nuisance dust and dirt on roads.

#### **7.5.1.3 Fuel and Chemical Handling**

The construction material storage yard is proposed to be located in the existing southern car parks within Intel's compound, between towers T1-T2 and T2-T3.

Wash-out of concrete trucks will not occur at the proposed development site, instead wash-out will be undertaken at the supplier washout facility. The location for the washout facilities is in Kilsaran, Adamstown, Lucan, Dublin and Roadstone which is located at Roadstone retail belgard, Tallaght, Dublin.

All chemicals and fuels will be stored properly in identified areas within the construction compound. No batching of wet-cement products will occur on site. Ready-mixed concrete will be delivered to the excavation site. Wash-down of concrete contaminated equipment will not take place within the site.

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

Refuelling areas are to be identified in the CEMP prepared by the construction contractor. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

In the case of drummed fuel or other chemicals which may be used during construction, containers should be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

Emergency response procedures will be outlined in the detailed CEMP. All personnel working on the site will be suitably trained in the implementation of the procedures.

All vehicles should be regularly checked for oil leaks, and ruptured hose pipes.

These measures are complementary to the control environmental measures described in Section 7.2.2 above.

#### **7.5.1.4 Control of Water during Construction**

Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the work areas which limits the potential for any offsite impacts.

Any minor ingress of groundwater and collected rainfall in the excavation will be pumped out during construction.

There shall not be discharge of silty water from the works to any watercourse, should any discharge of construction water be required during the construction phase, discharge will be to foul sewer following agreement with Kildare CC/ Irish Water.

There will be no discharge of effluent to groundwater during the construction phase. All wastewater from the construction facilities will be stored for removal off site for disposal and treatment.

All works in the SAC on adjacent to it will comply with current best practice, notable the Inland Fisheries Ireland Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016) and Transport Infrastructure Ireland's Guidelines for the crossing of watercourses during the construction of national road schemes (TII, 2008).

The contractor shall be obliged to ensure no deleterious discharges are released from the sites to the River Rye Water during excavation, de-watering, or erecting activities. Throughout the period of works the contractor shall also take account of relevant legislation and best practice guidance including but not limited to the following:

- C532 Control of water pollution from construction sites: guidance for consultants and contractors;
- C648 Control of water pollution from linear construction projects;
- SP156 Control of water pollution from construction sites – guide to good practice;
- NRA's 'Guidelines for the Crossing of Watercourses during Construction of National Road Schemes (NRA, 2005);
- The Eastern Regional Fisheries Board guidance document 'Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites' (Murphy, 2004); and
- The Southern Regional Fisheries Board guidance document 'Maintenance and protection of the inland fisheries resource during road construction and improvement works' (Kilfeather, 2007).

In order to minimise the risk of contamination, any stockpiled material designated for removal will be removed off-site as soon as possible. Surface water drain gratings in areas near or close to where stockpiles are located will be covered by appropriate durable polyurethane covers or similar. Active treatment systems such as siltbusters or similar will be adopted, depending on turbidity levels and discharge limits.

#### 7.5.1.5 Monitoring Measures

Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 10 m from surface water receptors. Regular inspection of surface water run-off and any sediment control measures (e.g. silt traps) will be carried out during the construction phase.

Regular auditing of construction / mitigation measures will be undertaken, e.g. concrete pouring, refuelling in designated areas, etc. A log the regular inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not occur.

### 7.5.2 OPERATIONAL PHASE

There will not be abstractions from or discharge to the aquifer. In addition, it is expected that any effect on soils will be localised due to the anticipated thickness of low-permeability protective overburden. No future soil or groundwater monitoring is proposed as part of the proposed project as no bulk chemical storage on site.

## 7.6 RESIDUAL IMPACTS

### 7.6.1 CONSTRUCTION PHASE

The implementation of mitigation measures outlined above will ensure that the predicted impacts on the geological and hydrogeological environment do not occur during the construction phase and that the residual impact will be **temporary-imperceptible-neutral**. Following the TII criteria (refer to

Appendix 7.1) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

## 7.6.2 OPERATIONAL PHASE

The implementation of mitigation measures outlined above will ensure that the predicted impacts on the geological and hydrogeological environment do not occur during the operational phase and that the residual impact will be **long term-imperceptible-neutral**. Following the TII criteria (refer to Appendix 7.1) for rating the magnitude and significance of impacts on the geological and hydrogeological related attributes, the magnitude of impact is considered **negligible**.

## 7.7 CUMULATIVE IMPACT

### 7.7.1 CONSTRUCTION PHASE

Contractors for the proposed development will be contractually required to operate in compliance with the Outline CEMP which includes the mitigation measures outlined in this EIA report. Other developments will also have to incorporate measures to protect soil and water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Groundwater) Regulations (S.I. 9 of 2010 and S.I. 266 of 2016)). As a result, there will be minimal cumulative potential for change in soil quality or the natural groundwater regime. The cumulative impact is considered to be **temporary, neutral and imperceptible**.

### 7.7.2 OPERATIONAL PHASE

There are no other large projects proposed within this area of the aquifer so no cumulative impact on recharge to the aquifer. All developments are required to manage groundwater discharges in accordance with S.I. 9 of 2010 and S.I. 266 of 2016 amendments. As such there will be no cumulative impact to groundwater quality and therefore there will be no cumulative impact on the Groundwater Body Status. The operation of the proposed development is concluded to have a **long-term, imperceptible** significance with a **neutral** impact on soil and water quality.

## 7.8 INTERACTIONS

Due to the inter-relationship between soils, geology, hydrogeology and hydrology, the assessed impacts and mitigation measures discussed will be considered applicable to both chapters. There is also an interaction between this chapter and Biodiversity as the local groundwater would provide baseflow to the Rye Water SAC through alluvial deposits and bedrock. Waste topics is also an interaction due to the generation of excavated soil and stones required to facilitate site levelling and excavation of foundations.

Refer to Chapter 17 *Interactions & Cumulative Effects* for further details in relation to these interactions.

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28 NOV 2022

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## 8 WATER & HYDROLOGY

### 8.1 INTRODUCTION/METHODOLOGY

This chapter assesses and evaluates the potential impacts of the proposed development on the hydrological aspects of the site and surrounding area. In assessing likely potential and predicted effects, account is taken of both the importance of the attributes and the predicted scale and duration of the likely effects.

#### 8.1.1 CRITERIA FOR RATING OF EFFECTS

This chapter evaluates the effects, if any, which the proposed development will have on Hydrology as defined in the Environmental Protection Agency (EPA) 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (EPA, 2022). The Draft EPA document entitled 'Advice Notes for Preparing Environmental Impact Statements' (EPA, 2015) is also followed in this hydrological assessment and classification of environmental effects. In addition, the document entitled 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes' by the Transport Infrastructure Ireland (TII, 2009) is referenced where the methodology for assessment of impact is appropriate.

The rating of potential environmental effects on the hydrological environment is based on the standard EIAR impact predictions table included in Chapter 1 which takes account of the quality, significance, duration, and type of effect characteristic identified (in accordance with impact assessment criteria provided in the EPA Guidelines (2022) publication).

The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years. The construction of proposed development is targeted to be completed within one year.

The TII criteria for rating the magnitude and significance of impacts and the importance of hydrological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Tables 1-3 in Appendix 8.1.

The principal attributes (and impacts) to be assessed include the following:

- River and stream water quality in the vicinity of the site (where available);
- Surface watercourses near the site and potential impact on surface water quality arising from proposed development related works including any discharge of surface water run-off;
- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any); and
- Surface water features within the area of the site.

#### 8.1.2 SOURCES OF INFORMATION

Desk-based hydrological information in the vicinity of the site was obtained through accessing databases and other archives where available. Data was sourced from the following:

- Environmental Protection Agency (EPA) – website mapping and database information. Water quality monitoring data for watercourses in the area ([www.catchments.ie](http://www.catchments.ie));
- River Basin Management Plan for Ireland 2018-2021 (<https://www.gov.ie/en/publication/429a79-river-basin-management-plan-2018-2021/> )

- The Planning System and Flood Risk Management, Guidelines for Planning Authorities (Department of the Environment, Heritage and Local Government (DoEHLG) and the Office of Public Works (OPW));
- Office of Public Works (OPW) flood mapping data ([www.floodinfo.ie](http://www.floodinfo.ie));
- South Dublin City Council (2005), Greater Dublin Strategic Drainage Study: Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council;
- 'Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors' (CIRIA 532, 2001);
- National Parks and Wildlife Services (NPWS) – Protected Site Register.

Site specific data was derived from the following sources:

- Geotechnical Interpretative Report. Collinstown 110kV OHL Diversion. IGSL, July 2022;
- Geotechnical Interpretative Report (Factual). Collinstown 110kV OHL Diversion. IGSL, June 2022;
- Design Report. Collinstown 110kV OHL Diversion Project. Mott MacDonald, December 2021;
- CEMP Information. Collinstown 110kV OHL Diversion Project. Mott MacDonald, March 2022;
- Hydrological and Hydrogeological Qualitative Risk Assessment for A Ground Investigation Works Execution Plan at Intel Ireland Campus. Leixlip, Co. Kildare. AWN, March 2022;
- Various design site plans and drawings.

## 8.2 THE PROPOSED DEVELOPMENT

### 8.2.1 GENERAL DESCRIPTION OF THE DEVELOPMENT

The proposed realignment will consist of the following principal elements:

- The installation of 7 new double circuit steel lattice towers and replacement of 2 existing double circuit towers ranging in height from approximately 20.75 m to 39.75 m above ground level and supporting three electrical conductors, one earth wire and associated overhead line infrastructure
- The decommissioning and removal of 4 existing towers and associated electrical conductors
- All ancillary site development, preparation and reinstatement works:

### 8.2.2 CONTROL ENVIRONMENTAL MEASURES

The following control measures will be used to avoid release of cement leachate from the site:

- No batching of wet-cement products will occur on site;
- Ready-mixed concrete will be delivered to the excavation site. Where possible, emplacement of pre-cast elements, will take place. Where possible pre-cast elements will be used;
- Shuttering and formwork shall be checked for gaps by the EnCoW in advance of pouring. Where necessary, polyurethane foam may be used to seal shuttering joints to prevent concrete leaking.
- Wash-down of concrete contaminated equipment will not take place within the site.
- Concrete trucks will be brought as close as possible to the excavation to pour directly into the excavation. If this is not possible, concrete will be transported in dumpers fitted with concrete chutes;
- No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;
- No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed;
- Weather forecasting will be used to plan dry days for pouring concrete;
- Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event;
- The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a concrete washout area.

Wash-out of concrete trucks will not occur at the proposed development site, instead wash-out will be undertaken at the supplier washout facility. The location for the washout facilities is in Kilsaran.

Adamstown, Lucan, Dublin and Roadstone which is located at Roadstone retail belgard, Tallaght, Dublin.

All chemicals and fuels will be stored properly in identified areas within the construction compound.

There will be a bunded bowser located in the construction compound to refuel track machines, site dumpers, rollers and articulated dumpers, etc. Refuelling should take place within areas of hardstanding. The bowser will be filled directly from delivery tanker. A drip tray placed under the filling point at all times to prevent discharges of fuel. Spill-kits and hydrocarbon absorbent packs will be stored in the cabin of each vehicle and operators will be fully trained in the use of this equipment.

Refer to Chapter 4 *Project Description* for further details.

## 8.3 THE RECEIVING ENVIRONMENT

The receiving environment is discussed in terms of surface water and hydrology in the following sections.

### 8.3.1 GENERAL DESCRIPTION OF THE SITE

The development site is associated with the realignment project of the 110kV OHL which traverses the Intel campus. The chosen route consists of the diverting of the OHL to the East of the campus site with connections to the existing overhead line at the Lidl carpark at the south of the site (T1) and to the existing overhead line at a location north of the River Rye (T7).

The OHL diversion project is located in an environmental sensitive area. The line runs in close proximity to the Rye Water Valley/Carton SAC which stretches along either side of the River Rye from the Carton Estate to the Leixlip Spa. The area and its wildlife are protected from site development and disturbance. The area is designated as a SAC due to the value of the area to the local community and the presence of a wide diversity of wildlife, including some endangered species. The overhead line crosses the River Rye between Tower 6 and Tower 7.

Intel Ireland's Leixlip campus is located off the R148 Maynooth-Leixlip Regional Road approximately 1.6 km north of the M4 motorway route (Junction 6) and 2 km northwest of Leixlip town centre. To the front (south) of the plant the campus grounds are mainly flat in topography consisting of employee multi-level car parks, tarmac-surfaced car parks and, in Eastlands, gravel-surfaced car parks. Peripheral landscaped areas bound the site. To the rear of the plant there is a gradual slope descending from south to north towards the Rye Water River valley. There is, however, a pronounced descent from the elevation of the newly built Process Water Tanks in Eastlands (c.59 m OD) through to the green belt referred to earlier (T4 & T5 / 55 – 47 m OD) and beyond to the Rye Water River (c.33 m OD).

### 8.3.2 HYDROLOGY

The proposed SI work sites lie within the Liffey and Dublin Bay Catchment (Hydrometric Area 09), River Liffey sub-catchment (WFD name: Liffey\_SC\_080, Id 09\_5) and Rye Water sub-basin (WFD name: Rye\_Water\_040, EU Code IE\_EA\_09R010600) (EPA, 2022).

The nearest surface water receptor is the River Rye Water (Waterbody Code IE\_EA\_09R010600) which is located c. 90m and 70 m from the T5 and T6 towers, refer to Figure 8.1 below). The Rye Water rises in southern Co. Meath and enters the River Liffey at Leixlip. The catchment of the Rye Water is relatively flat and is approximately 215 km<sup>2</sup> in area to Leixlip Bridge. It flows in a southeasterly direction and passes close to the towns of Kilcock and Maynooth and through the Carton House demesne and is a tributary of the River Liffey. An electricity generating dam is situated upstream of the Rye Water and River Liffey confluence in Leixlip. The site of the proposed development is located within the lower catchment area of the Liffey.

The River Rye Water surface waterbody hosts SAC, and NHA habitats which are located adjacent to the nearest tower T5. It should be noted that none of the projected towers will be within the SAC area.

The Leixlip Spa site in Co. Kildare is a wetland area which developed on five distinct terraces with shallow bedrock and constitutes part of the Rye Water Valley Special Area of Conservation, site code: 001398. Refer to below for site location in relation to SAC and Leixlip Spa.

The Rye Water Valley/Carton SAC (Site Code 001398) is located between Leixlip and Maynooth, in Counties Meath and Kildare, and extends along the Rye Water, a tributary of the River Liffey. The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive:

- Petrifying Springs
- Narrow-mouthed Whorl Snail (*Vertigo angustior*)
- Desmoulin's Whorl Snail (*Vertigo moulinsiana*)

The Rye Water and the habitat is described in more detail within the Biodiversity Chapter 6.

The Leixlip Spa includes the Louisa Bridge petrifying springs with a tufa formation on the southern bank of the Rye Water. The Louisa spring is located within the Leixlip Spa boundary, which is adjacent to the east of the projected T5 tower. The Leixlip Spa has two sources of groundwater. The main source of water comes from a deeper, older and warmer groundwater system, discharging at the top of the first terrace through the Spa Well. The second is a more recent, shallow groundwater that flows through shallower limestone bedrock with the main groundwater discharge located in the vicinity of the fen wetland habitat ('filtering ponds') at the most elevated, southern terrace and at a similar horizon on surrounding drainage. The tufa is deposited as water saturated with calcium carbonate releases carbon dioxide resulting in natural deposition of tufa along a natural terrace paralleling the Rye Water River.

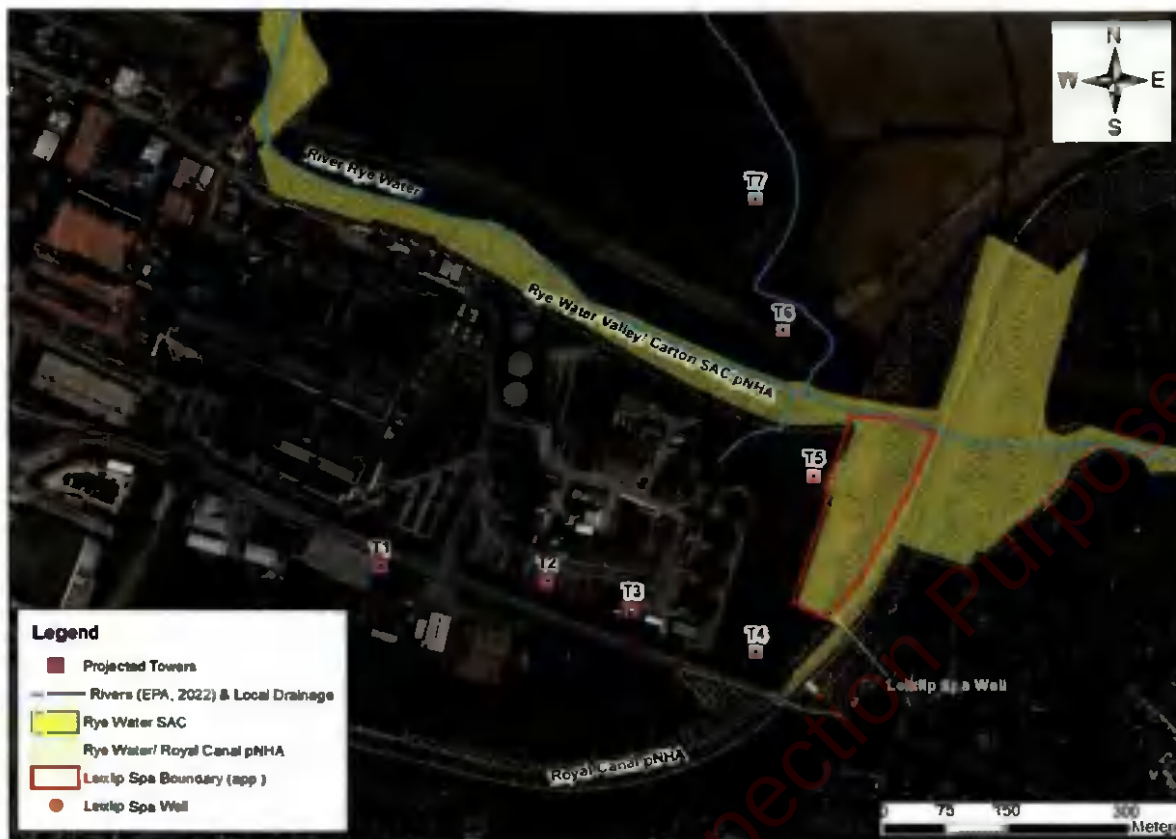
The Royal Canal is located to the south of the proposed works, it is upgradient in terms of groundwater flow direction and is lined. The Royal Canal links the River Liffey in Dublin to the River Shannon stretching 146 km with 46 locks, 10 of them double-chambered. The Royal Canal is a pNHA with its main water supply from Lough Owel (also a SAC) via a feeder channel into the canal at Mullingar.

There is no hydrological linkage between the area of the proposed tower areas and the Canal.

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**Figure 8.1 Site Location and Local Environment**

2 no. small tributaries streams have been identified in the vicinity of the site. The Collinstown Stream (as identified by the EPA maps) flows adjacent to T6 and T7 in the northside of the Rye Water. An unnamed stream/ open ditch has also been identified in the southside. These 2 no. streams discharges into the Rye Water (refer to Figure 8.1 above). In addition to these small scale stream, no ditches or active open water courses have been identified in the immediate vicinity of the projected towers. However, there is a ditch running north-south to the east of both T4 and T5 which seems to be dry.

### 8.3.3 SURFACE WATER QUALITY

The development is located within the former ERBD (now the Irish River Basin District), as defined under the European Communities Directive 2000/60/EC, establishing a framework for community action in the field of water policy – this is commonly known as the Water Framework Directive (WFD). It is situated in Hydrometric Area No. 09 of the Irish River Network and is located within the River Liffey Catchment.

The Water Framework Directive (WFD) Directive 2000/60/EC was adopted in 2000 as a single piece of legislation covering rivers, lakes, groundwater and transitional (estuarine) and coastal waters. In addition to protecting said waters, its objectives include the attainment of 'Good Status' in water bodies that are of lesser status at present and retaining 'Good Status' or better where such status exists at present.

The WFD requires 'Good Water Status' for all European waters to be achieved through a system of river basin management planning and extensive monitoring by 2015 or, at the least, by 2027. 'Good status' means both 'Good Ecological Status' and 'Good Chemical Status'. In 2009 the ERBD River Basin Management Plan (RBMP) 2009-2015 was published. In the ERBD RBMP, the impacts of a range of pressures were assessed including diffuse and point pollution, water abstraction and morphological pressures (e.g., water regulation structures). The purpose of this exercise was to identify water bodies at risk of failing to meet the objectives of the WFD by 2015 and include a

programme of measures to address and alleviate these pressures by 2015. This was the first River Basin Management planning cycle (2010-2015). The second cycle river basin management plan for Ireland took place between 2018-2021 with the previous management districts now merged into one Ireland River Basin District (Ireland RBD). The third cycle is currently in place and will run between 2022-2027.

This third-cycle RBMP aims to build on the progress made during the second cycle. Key measures during the second cycle included the licensing of urban waste-water discharges (with an associated investment in urban waste-water treatment), the development of water and planning guidance for local authorities to help with the consideration of risks to river basin objectives in planning and development decision-making, the introduction of the Agricultural Sustainability Support and Advisory Programme (ASSAP) and the creation of a programme for the protection of high-status water bodies. Key measures to be developed during the third cycle include the reduction of loss of fertilisers and soil from farmland into water, reduction of the physical impacts on water bodies – caused by the drainage of lands and rivers and the presence of barriers (weirs, dams, etc.), to ensure continued investment in urban and rural water services and protect water bodies from future deterioration. The third cycle RBMP has been developed to address these points.

The strategies and objectives of the WFD in Ireland have influenced a range of national legislation and regulations. These include the following:

- European Communities (Water Policy) Regulations, 2003 (S.I. No. 722 of 2003);
- European Communities (Drinking Water) Regulations 2014 (S.I. 122 of 2014);
- European Communities Environmental Objectives (Surface Waters); Regulations, 2009 (S.I. No. 272 of 2009 as amended by SI No. 77 of 2019)
- European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010, S.I. No. 366 of 2016);
- European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2010 (S.I. No. 610 of 2010);
- European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011)
- Statutory Instrument (SI) No. 293 of 1988 European Communities (Quality of Salmonid Waters) Regulations 1988;
- Local Government (Water Pollution) Acts 1977-1990;
- SI No. 258 of 1988 Water Quality Standards for Phosphorus Regulations 1998;

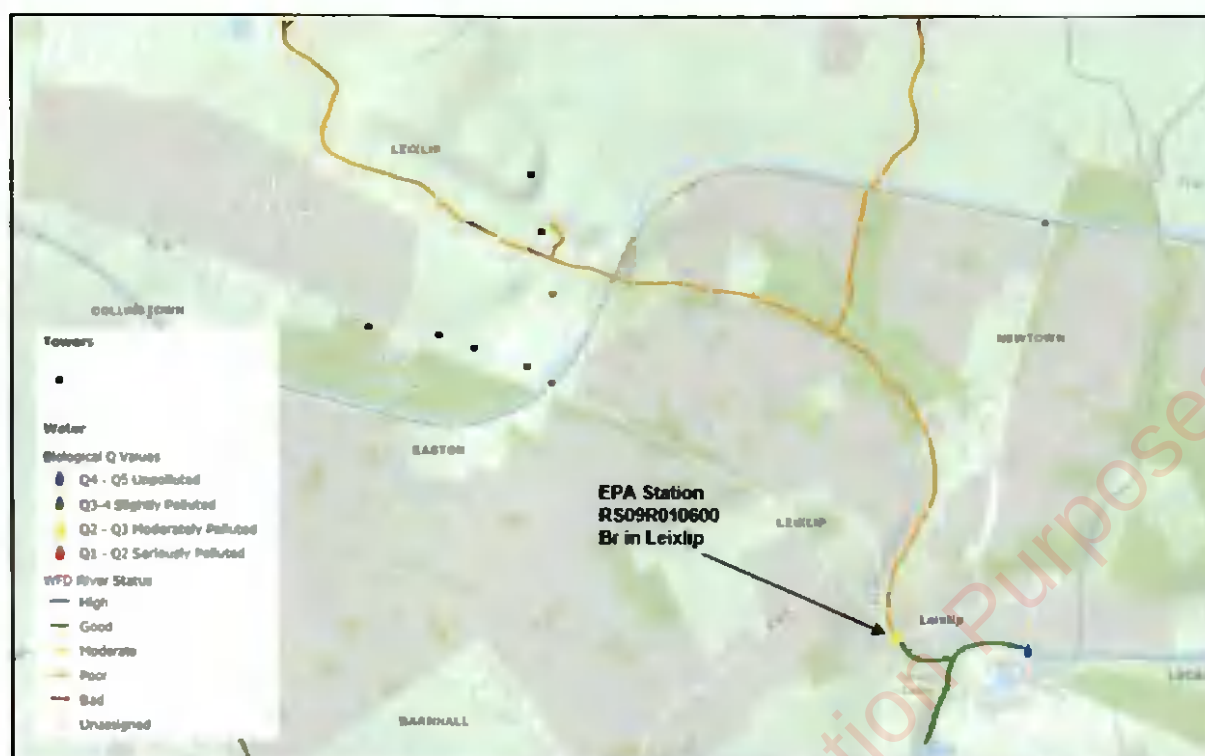
The Rye Water River in this area belongs to the Rye\_Water\_040 WFD surface water body. The most recent published status ([www.epa.ie](http://www.epa.ie) – River Waterbody WFD Status 2013-2018) of this waterbody is 'Poor' and its WFD risk score is 'At risk of not achieving good status'. Its 'Poor' status is associated with its Biological (Invertebrate) Status or Potential.

The above status for the Rye Water River is related to data from 1 no. EPA active water quality station in Leixlip (RS09R010600), located in c. 1.7 km downstream of the projected OHL line and immediately upstream from where the Rye Water River enters the River Liffey (refer to Figure 8.2 below).

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28 NOV 2022

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**Figure 8.2 EPA Water Quality Stations near of the Subject Site<sup>29</sup>**

Surface water quality is monitored periodically by the EPA at various regional locations along with principal and other smaller watercourses. The EPA assess the water quality of rivers and streams across Ireland using a biological assessment method, which is regarded as a representative indicator of the status of such waters and reflects the overall trend in conditions of the watercourse. Q Values are used by the EPA to express biological water quality, based on changes in the macro invertebrate communities of riffle areas brought about by organic pollution. See Table 8.1 below for an explanation of the ratings. Q1 indicates a seriously polluted water body; Q5 indicates unpolluted water of high quality. Q Values for the River Rye Water are shown in Table 8.2 below.

**Table 8.1 EPA Biological Q Ratings**

| Quality ratings (Q) | Status   | Water quality       |
|---------------------|----------|---------------------|
| Q5, Q4-5            | High     | Unpolluted          |
| Q4                  | Good     | Unpolluted          |
| Q3-4                | Moderate | Slightly polluted   |
| Q3, Q2-3            | Poor     | Moderately polluted |
| Q2, Q1-2, Q1        | Bad      | Seriously polluted  |

**Table 8.2 Q Ratings for River Rye Water**

| RIVER     | Station No. | Location          | Biological Quality Ratings (Q Values) |      |      |      |      |      |      |      |      |      |
|-----------|-------------|-------------------|---------------------------------------|------|------|------|------|------|------|------|------|------|
|           |             |                   | 1991                                  | 1996 | 1998 | 2002 | 2005 | 2007 | 2010 | 2013 | 2016 | 2019 |
| Rye Water | RS09R010600 | Bridge in Leixlip | 3-4                                   | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3    | 3-4  |

As it can be seen from Q Ratings above, the most recent surface water quality data for the Rye Water River indicates that it is 'Slightly Polluted'. This means an improvement from Poor to Moderate status compared to its previous data. Filamentous algae was observed in the station during the 2019 monitoring.

<sup>29</sup> Source: EPA, 2022

### 8.3.4 FLOODING

A Flood Risk Assessment for the site has been undertaken by AWN Consulting which is included in the current application. The review of the available data on fluvial, pluvial and groundwater flooding shows that the proposed development site has no historical flood hazard identified in the vicinity; however, the Tower 6 will be erected within the CFRAM Flood Zone A and B; these zones were also ratified by the Leixlip Local Area Plan. According to the FRM Guidance, the development is considered to be an essential infrastructure category (electricity distribution); as such it is classified as 'Highly Vulnerable' Development. As such, it is considered that a Stage 2 should proceed for this structure.

With regard to the other 6 no. towers, they are located within Flood Zone C and are therefore considered to be 'appropriate' for this flood zonation and a Justification Test for Development Management is not required for them.

According to the Initial Flood Risk Assessment (Stage 2) for tower T6, it is concluded that there is no conflict between flood risk and the construction of the tower T6, as its structural design has taken into account the possible buoyancy effect of the expected flood level, which in a current scenario is expected to mean a water height of c. 0.80 m and 1.43 m above ground level, for a medium and low annual exceedance probability, respectively (1% and 0.1%).

There are no potential residual risks as the projected tower will not affect any other existing infrastructure should an extreme event occur.

### 8.3.5 RATING OF IMPORTANCE OF HYDROLOGICAL ATTRIBUTES

Based on the TII methodology (2009) (See Appendix 8.1), and criteria for rating site importance of hydrological features, the importance of the hydrological features at this site is rated as "Extremely High" based on the on the proximity of the site to the Rye Water Valley/Carlton SAC.

## 8.4 PREDICTED EFFECTS

An analysis of the potential effects of the proposed development on the hydrological environment during the construction and operation is outlined below. Due to the inter-relationship between soils, geology and hydrogeology and hydrology the following impacts discussed will be considered applicable to both Chapter 7 *Land, Soils, Geology & Hydrogeology* and 8 *Hydrology* of the EIA. Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in Section 8.5 below.

### 8.4.1 CONSTRUCTION PHASE

In the absence of mitigation, the following potential effects to hydrology have been considered for the construction phase.

#### 8.4.1.1 Dewatering

It is expected that dewatering will be required during the excavation of T6 tower which location lies close to the Rye River in a relatively low-lying area. There may be some connectivity between the groundwater regime in the area of Tower 6 and the level of the nearby Rye Water River. The projected depth of the tower is 2.8 m and its surface area 2.8 m x 4.0 m.

The shallow and bedrock groundwater regime local to the Rye Water SAC will be unchanged during construction. There will be a temporary local impact around the excavation area due to required dewatering. However, given the size of the excavation projected and the presence of cohesive deposits over the bedrock, no impact on water levels or flow in the river is expected from the localised temporary groundwater dewatering during construction. Post construction, the natural groundwater regime will quickly return to normal.

No significant dewatering is expected in the other towers, with the exception of T4 whose location overlies granular deposit. Any water in the excavation will be pumped out prior to any concrete being poured into the foundation. If groundwater is encountered, it will be pumped into IBC tanks or a vacuum truck used for dewatering and removed offsite to an approved facility.

The temporary impact during construction caused by the proposed dewatering will have no effect on the complex of springs and seepages at Louisa Bridge, as it will not impact on the deep or shallow groundwater feeding these springs. The shallow groundwater at the proposed excavation and Louisa Spring are not in hydraulic continuity and the groundwater flow directions differ.

It can be expected to encounter minor ingress of rainfall in the excavation during the construction phase.

In the absence of mitigation, the effect on the local and regional environment is likely to be **temporary, slight** and **negative**.

#### 8.4.1.2 Increased Sediments Loading in Run-off

Surface water runoff during the construction phase may contain increased silt levels or become polluted from construction activities. Runoff containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from dewatering excavations, exposed ground, stockpiles and access roads. Environmental control measures highlighted in Section 8.2.2 will be employed to remove the risk to affect the local hydrological environment.

According to the Site Investigations carried out by IGSL in 2022, the risk of contaminated soils being present on site is low and this was confirmed by onsite soil sampling and analysis. Nonetheless material, which is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments.

All surplus waste arising during the construction phase will be managed and disposed of to a licensed landfill. This ensures compliance with the provisions of the Waste Management Act 1996 (as amended) and the extant Eastern Midlands Region Waste Management Plan (2015-2021). A Construction Waste Management Plan will be implemented to minimise waste and ensure correct handling and disposal of construction waste streams in accordance with the "Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects" (Environmental Protection Agency, 2021).

Site investigation and laboratory analysis has not identified any existing contamination. However, if contaminated soil/water is encountered, it will be required to be removed by a licensed waste contractor.

In the absence of mitigation, the effect on the local and regional environment is likely to be **temporary, slight** and **negative**.

#### 8.4.1.3 Accidental Spills and Leaks

As with all construction projects there is potential for water (rainfall and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant temporary risk to groundwater and surface water quality for the duration of the construction if contaminated water is allowed percolate to the aquifer or be discharged into a surface water receptor (Rye Water SAC).

During construction of the development, there is a risk of accidental pollution incidences from the following sources:

- Suspended solids (muddy water with increase turbidity) – arising from excavation and ground disturbance;
- Cement/concrete (increase turbidity and pH) – arising from construction materials;
- Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
- Wastewater (nutrient and microbial rich) – arising from accidental discharge from on-site toilets and washrooms.

Accidental spillages which are not mitigated may result in localised contamination of soils and groundwater underlying the site, should contaminants migrate through the subsoil's and impact the underlying groundwater. Any soil stripping will also further reduce the thickness of subsoil and the natural protection they provide to the underlying aquifer; however, bedrock is assumed to be below the maximum projected excavation depths, with the exception of T6 as explained above.

In the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, slight and negative**.

#### 8.4.2 OPERATIONAL PHASE

There will be a minimal decrease in recharge area (c. 96.8 m<sup>2</sup>) associated with the foundations surface area. Once these are installed into the overburden, there could be a minimal cut of the shallow horizontal recharge/ groundwater flow. However, this will not affect the regional water table within bedrock or the hydrological/ hydrogeological regime of the water environmental receptors (Rye Water SAC and Leixlip Spa). This will have a minor effect on local recharge to ground; however, the impact on the overall hydrological regime will be imperceptible.

In the absence of mitigation, the effect on the hydrological environment is likely to be **long-term, imperceptible and negative**.

#### 8.4.3 DO NOTHING SCENARIO

If the proposed development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no, excavation or erection of towers at these sites. There would, therefore, be a neutral effect on the hydrological environment in terms of waste.

### 8.5 MITIGATION AND MONITORING MEASURES

The design has taken account of the potential impacts of the development on the hydrological environment in the area where construction is taking place and containment of contaminant sources during operation. Control environmental measures have been incorporated in the design to mitigate the potential effects on the surrounding soils, geology and hydrogeology (refer to Section 8.2.2 above). These are described below.

Due to the inter-relationship between soils, geology, hydrogeology, hydrology and biodiversity, the following mitigation measures discussed will be considered applicable to all. Waste Management is also considered an interaction in some sections.

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### 8.5.1 CONSTRUCTION PHASE

In order to reduce impacts on the soils and geology environment, a number of mitigation measures will be adopted as part of the construction works on site. The measures will address the main activities of potential impact which include:

- Control of soil excavation/ infill and export from site;
- Fuel and chemical handling, transport and storage; and
- Control of water during construction.

#### 8.5.1.1 Construction Environmental Management Plan (CEMP)

In advance of work starting on site, the works Contractor will prepare a detailed Construction Environmental Management Plan (CEMP). The detailed CEMP will set out the overarching vision of how the construction of the proposed development will be managed in a safe and organised manner by the Contractor. The CEMP will be a live document and it will go through a number of iterations before works commence and during the works. It will set out requirements and standards which must be met during the construction stage and will include the relevant mitigation measures outlined in the EIA Report and any subsequent planning conditions relevant to the proposed development.

As a minimum, the CEMP will be formulated in accordance with best international practice including but not limited to:

- CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532) Construction Industry Research and Information Association;
- CIRIA (2002) Control of water pollution from construction sites: guidance for consultants and contractors (SPI56) Construction Industry Research and Information Association
- CIRIA (2005), Environmental Good Practice on Site (C650); Construction Industry Research and Information Association
- BPGCS005, Oil Storage Guidelines;
- Eastern Regional Fisheries Board, (2006), Fisheries Protection Guidelines: Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites;
- CIRIA 697, The SUDS Manual, 2007; and
- UK Pollution Prevention Guidelines (PPG) UK Environment Agency, 2004.

In order to reduce impacts on the hydrological environment, a number of mitigation measures will be adopted as part of the construction works on site as outlined below.

#### 8.5.1.2 Surface Water Run-off

Surface water runoff during the construction phase may contain increased silt levels or become polluted from construction activities. Runoff containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from dewatering excavations, exposed ground, stockpiles and access roads. Environmental control measures highlighted in Section 8.2.2 will be employed to remove the risk to affect the local hydrological environment.

Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the work areas which limits the potential for any offsite impacts.

Any minor ingress of groundwater and collected rainfall in the excavation will be pumped out during construction.

There shall not be discharge of silty water from the works to any watercourse, should any discharge of construction water be required during the construction phase, discharge will be to foul sewer following agreement with Kildare CC/ Irish Water.

There will be no discharge of effluent to groundwater during the construction phase. All wastewater from the construction facilities will be stored for removal off site for disposal and treatment.

All works in the SAC on adjacent to it will comply with current best practice, notable the Inland Fisheries Ireland Guidelines on protection of fisheries during construction works in and adjacent to

waters (IFI, 2016) and Transport Infrastructure Ireland's Guidelines for the crossing of watercourses during the construction of national road schemes (TII, 2008).

The contractor shall be obliged to ensure no deleterious discharges are released from the sites to the River Rye Water during excavation, de-watering, or erecting activities. Throughout the period of works the contractor shall also take account of relevant legislation and best practice guidance including but not limited to the following:

- Inland Fisheries Ireland's Requirements for the Protection of Fisheries Habitat during Construction and Development Works.
- CIRIA (Construction Industry Research and Information Association) Guidance Documents:
  - Control of water pollution from construction sites (C532)
  - Control of water pollution from linear construction projects: Technical Guidance (C648)
  - Control of water pollution from linear construction projects: Site Guide (C649)
  - Environmental Good Practice on Site (C692)
- NRA Guidance Documents:
  - Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes).

In order to minimise the risk of contamination, any stockpiled material designated for removal will be removed off-site as soon as possible. Surface water drain gratings in areas near or close to where stockpiles are located will be covered by appropriate durable polyurethane covers or similar. Active treatment systems such as siltbusters or similar may will be adopted, depending on turbidity levels and discharge limits.

Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any open surface water drains. Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust. The tower foundations will be backfilled one leg at a time with the excavated material. The backfill is placed and compacted in layers. When the base construction crew leave the site, they will ensure the removal of all surplus materials from the site, including all unused excavated fill.

As mentioned in the proposed development section, if contaminated soil/water is encountered, it will be required to be removed by a licensed waste contractor. Further soil sampling will be undertaken during pre-development works. The contractor will be required to submit a Construction Waste Management Plan (CWMP) to the local authority for approval which will address all types of material to be disposed of. Site investigation and laboratory analysis has not identified any existing contamination.

Measures to minimise the suspension and mobilisation of sediment downstream of the working area should consider silt barriers and coffer damming to create dry working areas.

To avoid excessive silt runoff, site clearance is not to be undertaken during wet conditions, when rainfall of more than 0.5 mm/hour is forecast within the next 24 hours or rainfall of more than 3mm/hour is forecast within the next five days in the Leixlip area. At the riverbank works locations, silt fencing will be installed along the river bank to retain eroded sediments. Catch nets may be used where relevant.

Soil cleared from the site and all materials associated with the building process are to be stored outside the flood zone in designated storage areas. The flood zone will be delineated on the works areas. No soil storing will be allowed within 30 m of the open water, which is in line with the Inland Fisheries Ireland guidelines.

#### 8.5.1.3 Fuel and Chemical Handling

The construction material storage yard is proposed to be located in the existing southern car park within Intel's compound, between towers T1-T2 and T2-T3.

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Wash-out of concrete trucks will not occur at the proposed development site, instead wash-out will be undertaken at the supplier washout facility. The location for the washout facilities is in Kilsaran, Adamstown, Lucan, Dublin and Roadstone which is located at Roadstone retail belgard, Tallaght, Dublin.

All chemicals and fuels will be stored properly in identified areas within the construction compound. No batching of wet-cement products will occur on site. Ready-mixed concrete will be delivered to the excavation site. Wash-down of concrete contaminated equipment will not take place within the site.

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

Refuelling areas are to be identified in the CEMP prepared by the construction contractor. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as "Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors" (CIRIA 532, 2001) will be complied with.

In the case of drummed fuel or other chemicals which may be used during construction, containers should be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

Emergency response procedures will be outlined in the detailed CEMP. All personnel working on the site will be suitably trained in the implementation of the procedures.

All vehicles should be regularly checked for oil leaks, and ruptured hose pipes.

These measures are complementary to the control environmental measures described in Section 7.2.2 above.

#### **8.5.1.4 Monitoring Measures**

Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 10 m from surface water receptors. Regular inspection of surface water run-off and any sediment control measures (e.g. silt traps) will be carried out during the construction phase.

Regular auditing of construction / mitigation measures will be undertaken, e.g. concrete pouring, refuelling in designated areas, etc. A log the regular inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not occur.

#### **8.5.2 OPERATIONAL PHASE**

There will not be abstractions from or discharge to the aquifer. In addition, it is expected that any effect on soils will be localised due to the anticipated thickness of low-permeability protective overburden. No future soil or groundwater monitoring is proposed as part of the proposed project as no bulk chemical storage on site.

## 8.6 RESIDUAL IMPACTS

### 8.6.1 CONSTRUCTION PHASE

The implementation of mitigation measures outlined above will ensure that the predicted impacts on the hydrological environment do not occur during the construction phase and that the residual impact will be **temporary-imperceptible-neutral**. Following the TII criteria (refer to Appendix 8.1) for rating the magnitude and significance of impacts on the hydrological related attributes, the magnitude of impact is considered **negligible**.

### 8.6.2 OPERATIONAL PHASE

The implementation of mitigation measures outlined above will ensure that the predicted impacts on the hydrological environment do not occur during the operational phase and that the residual impact will be **long term-imperceptible-neutral**. Following the TII criteria (refer to Appendix 8.1) for rating the magnitude and significance of impacts on the hydrological related attributes, the magnitude of impact is considered **negligible**.

## 8.7 CUMULATIVE IMPACT

### 8.7.1 CONSTRUCTION PHASE

Contractors for the proposed development will be contractually required to operate in compliance with the Outline CEMP which includes the mitigation measures outlined in this EIA report. Other developments will also have to incorporate measures to protect surface water quality in compliance with legislative standards for receiving water quality (European Communities Environmental Objectives (Surface Water) Regulations (S.I. 272 of 2009 and S.I. 77 of 2019 amendments). As a result, there will be minimal cumulative potential for change in the natural hydrological regime. The cumulative impact is considered to be **temporary, neutral and imperceptible**.

### 8.7.2 OPERATIONAL PHASE

There are no other large projects proposed within this area of the aquifer so no cumulative impact on recharge to the aquifer. All developments are required to surface water discharges in accordance with S.I. 272 of 2009 and S.I. 77 of 2019 amendments. As such there will be no cumulative impact to surface water quality and therefore there will be no cumulative impact on the Surface Waterbody Status. The operation of the proposed development is concluded to have a **long-term, imperceptible** significance with a **neutral** impact on surface water quality.

## 8.8 INTERACTIONS

Due to the inter-relationship between soils, geology, hydrogeology and hydrology, the assessed impacts and mitigation measures discussed will be considered applicable to both chapters. There is also an interaction between this chapter and Biodiversity as the local hydrology would provide baseflow to the Rye Water SAC through small-scale tributaries.

Refer to Chapter 17 *Interactions & Cumulative Effects* for further details in relation to these interactions.

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## 9 AIR QUALITY & CLIMATE

### 9.1 INTRODUCTION/METHODOLOGY

This chapter assesses the likely air quality and climate impacts associated with the proposed development at Intel Campus, Collinstown, Leixlip, Co. Kildare. A full description of the development can be found in Chapter 4 *Project Description*.

This chapter has been prepared having regard to the following guidelines:

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- Advice Note on Preparing Environmental Impact Statements – Draft (EPA, 2015)
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013)
- Guidance on the Assessment of Dust from Demolition and Construction Version 1.1 (Institute of Air Quality Management (IAQM), 2014)
- UK Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air quality (UK Highways Agency, 2019a)
- UK Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate (UK Highways Agency, 2019b)

#### 9.1.1 CRITERIA FOR RATING OF IMPACTS

##### 9.1.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, national and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limit values or “Air Quality Standards” are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2011, which incorporate EU Directive 2008/50/EC, which has set limit values for a number of pollutants. The limit values for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>, are relevant to this assessment (see Table 9.1). Although the EU Air Quality Limit Values are the basis of legislation, other thresholds outlined by the EU Directives are used which are triggers for particular actions.

**Table 9.1 Ambient Air Quality Standards Regulations**

| Pollutant                                  | Regulation <sup>Note 1</sup> | Limit Type                                                                                | Value                                     |
|--------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------|-------------------------------------------|
| Nitrogen Dioxide                           | 2008/50/EC                   | Hourly limit for protection of human health - not to be exceeded more than 18 times/year  | 200 µg/m <sup>3</sup>                     |
|                                            |                              | Annual limit for protection of human health                                               | 40 µg/m <sup>3</sup>                      |
|                                            |                              | Critical level for protection of vegetation                                               | 30 µg/m <sup>3</sup> NO + NO <sub>2</sub> |
| Particulate Matter (as PM <sub>10</sub> )  | 2008/50/EC                   | 24-hour limit for protection of human health - not to be exceeded more than 35 times/year | 50 µg/m <sup>3</sup>                      |
|                                            |                              | Annual limit for protection of human health                                               | 40 µg/m <sup>3</sup>                      |
| Particulate Matter (as PM <sub>2.5</sub> ) | 2008/50/EC                   | Annual limit for protection of human health                                               | 25 µg/m <sup>3</sup>                      |

<sup>Note 1</sup> EU 2008/50/EC – Clean Air For Europe (CAFE) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

### 9.1.1.2 Dust Deposition Guidelines

The concern from a health perspective is focussed on particles of dust which are less than 10 microns (PM<sub>10</sub>) and less than 2.5 microns (PM<sub>2.5</sub>) and the EU ambient air quality standards outlined in Table 9.1 have set ambient air quality limit values for PM<sub>10</sub> and PM<sub>2.5</sub>.

With regards to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland. Furthermore, no specific criteria have been stipulated for nuisance dust in respect of this development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m<sup>2</sup>\*day) averaged over a one-year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Heritage & Local Government (DEHLG, 2004) apply the Bergerhoff limit of 350 mg/(m<sup>2</sup>\*day) to the site boundary of quarries. This limit value can also be implemented with regard to dust impacts from construction of the proposed development.

### 9.1.1.3 Climate Agreements

Ireland is party to both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The Paris Agreement, which entered into force in 2016, is an important milestone in terms of international climate change agreements and includes an aim of limiting global temperature increases to no more than 2°C above pre-industrial levels with efforts to limit this rise to 1.5°C. The aim is to limit global GHG emissions to 40 gigatonnes as soon as possible whilst acknowledging that peaking of GHG emissions will take longer for developing countries. Contributions to GHG emissions will be based on Intended Nationally Determined Contributions (INDCs) which will form the foundation for climate action post 2020. Significant progress was also made in the Paris Agreement on elevating adaption onto the same level as action to cut and curb emissions.

In order to meet the commitments under the Paris Agreement, the EU enacted *Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013* (the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. Ireland's obligation under the Regulation is a 30% reduction in non-ETS greenhouse gas emissions by 2030 relative to its 2005 levels.

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable Ireland to pursue, and

achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050 (3.(1) of No. 46 of 2015). This is referred to in the Act as the 'national transition objective'. The Act made provision for, *inter alia*, a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019a). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a). The plan contains similar elements as the 2019 CAP and aims to set out how Ireland can reduce our greenhouse gas emissions by 51% by 2030 (compared to 2018 levels) which is in line with the EU ambitions, and a longer-term goal of to achieving net-zero emissions no later than 2050. The 2021 CAP outlines that emissions from the Built Environment sector must be reduced to 4 – 5 MtCO<sub>2</sub>e by 2030 in order to meet our climate targets. This will require further measures in addition to those committed to in the 2019 CAP. This will include phasing out the use of fossil fuels for the space and water heating of buildings, improving the fabric and energy of our buildings, and promoting the use of lower carbon alternatives in construction.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019 and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme for the Climate Action (Amendment) Bill 2019 in December 2019 (Government of Ireland 2019b) followed by the publication of the Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021) (hereafter referred to as the 2021 Climate Act) in July 2021 (Government of Ireland, 2021b). The 2021 Climate Act was prepared for the purposes of giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act is to provide for the approval of plans 'for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050'. The 2021 Climate Act will also 'provide for carbon budgets and a decarbonisation target range for certain sectors of the economy'. The 2021 Climate Act defines the carbon budget as 'the total amount of greenhouse gas emissions that are permitted during the budget period'. The 2021 Climate Act removes any reference to a national mitigation plan and instead refers to both the Climate Action Plan, as published in 2019, and a series of National Long Term Climate Action Strategies. In addition, the Environment Minister shall request each local authority to make a 'local authority climate action plan' lasting five years and to specify the mitigation measures and the adaptation measures to be adopted by the local authority.

## 9.1.2 CONSTRUCTION PHASE

### 9.1.2.1 Air Quality

The Institute of Air Quality Management in the UK (IAQM) guidance document 'Guidance on the Assessment of Dust from Demolition and Construction' (2014) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is considered best practice in the absence of applicable Irish guidance.

The major dust generating activities are divided into four types within the IAQM guidance (2014) to reflect their different potential impacts. These are: -

- Demolition.
- Earthworks.
- Construction.
- Trackout (movement of heavy vehicles).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

Construction phase traffic also has the potential to impact air quality and climate. The UK DMRB guidance (UK Highways Agency, 2019), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. The use of the UK guidance is recommended by the TII (2011) in the absence of specific Irish guidance, this approach is considered best practice and can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- A change in speed band;
- A change in carriageway alignment by 5m or greater.

The construction stage traffic will not increase by 1,000 AADT or 200 HDV AADT on the surrounding roads. It is estimated that there will be a maximum of 60 inward and outward HGV trips per day during the peak construction period, for deliveries and removal of waste material. Therefore, the construction stage traffic does not meet the above scoping criteria. As a result a detailed air assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

#### 9.1.2.2 Climate

The impact of the construction phase of the development on climate was determined by a qualitative assessment of the nature and scale of greenhouse gas generating construction activities associated with the proposed development.

#### 9.1.3 OPERATIONAL PHASE

Due to the nature of the proposed development impacts to air quality and climate are not predicted for the operational phase as there will be no emissions to atmosphere associated with the development. As such an operational stage assessment has been scoped out.

### 9.2 THE PROPOSED DEVELOPMENT

The proposed developments aims to realign an approximate 1.1 km section of the existing Maynooth-Ryebrook 110 kV double circuit overhead line (OHL). The proposed OHL realignment will consist of the following principal elements:

- Diverting a section of the existing Maynooth-Ryebrook 110 kV double circuit OHL to the north of the River Rye, along the eastern edge of the Intel site at Collinstown, linking back into the existing OHL section at the Lidl car park to the immediate south of the R148
- The installation of 7 No new double circuit steel lattice towers and 2 No replacements of existing double circuit towers ranging in height from approximately 20.75 m to 30.75 m above ground level supporting three electrical conductors and associated overhead line infrastructure
- The decommissioning and removal of 4 No existing towers and associated electrical conductors

- Following diversion, the decommissioning and removal of the existing towers and associated electrical conductors from site
- All ancillary site development, preparation and reinstatement works, including access, landscaping and connection to existing services and utilities.

Refer to Chapter 4 *Project Description* for further details.

## 9.3 THE RECEIVING ENVIRONMENT

### 9.3.1 METEOROLOGICAL DATA

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to  $PM_{10}$ , the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than  $PM_{2.5}$ ) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ( $PM_{2.5}$  -  $PM_{10}$ ) will actually increase at higher wind speeds. Thus, measured levels of  $PM_{10}$  will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Casement Aerodrome meteorological station, which is located approximately 8 km south-east of the site. Casement Aerodrome met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 9.1). For data collated during five representative years (2017 - 2021), the predominant wind direction is south-westerly with generally moderate wind speeds (Met Eireann, 2022).

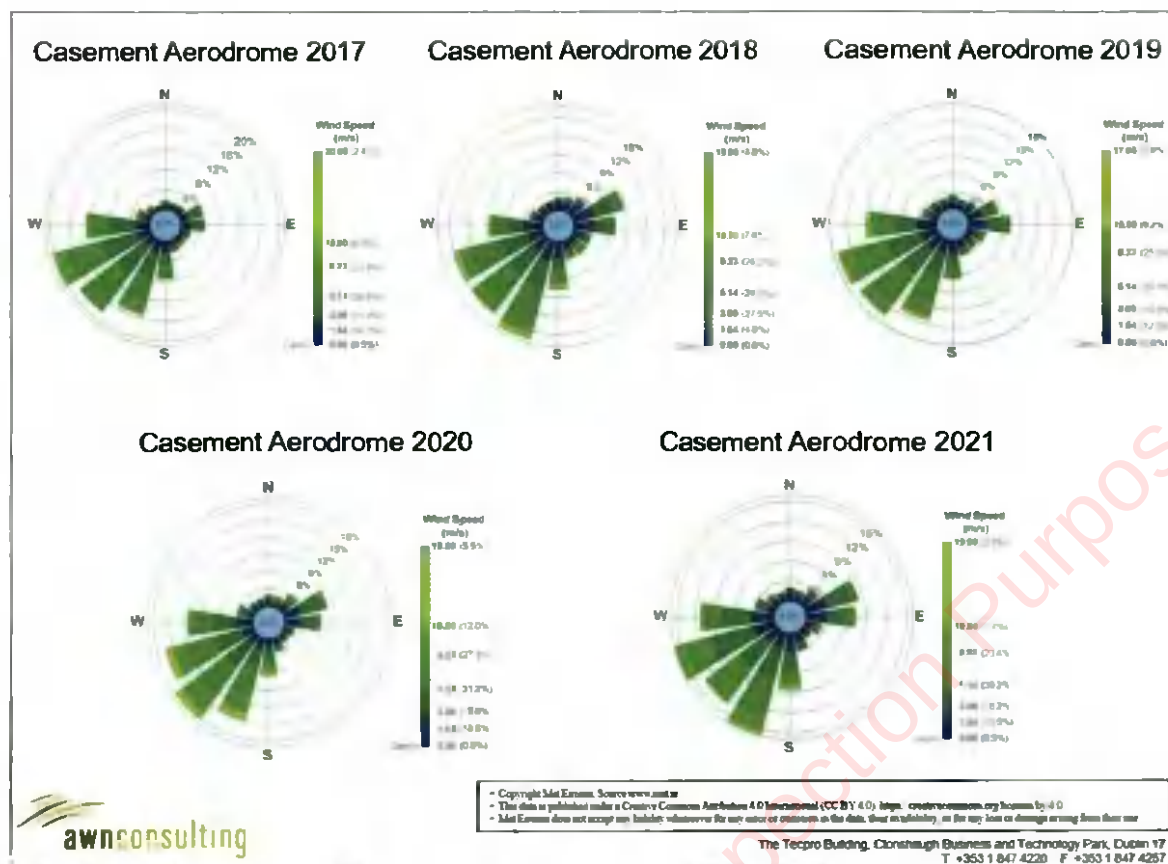


Figure 9.1 Casement Aerodrome Met Station Windrose 2017 – 2021<sup>30</sup>

### 9.3.2 BASELINE AIR QUALITY – EPA MONITORING DATA

Air quality monitoring programs have been undertaken in recent years by the EPA and Local Authorities. The most recent EPA published annual report on air quality ‘Air Quality In Ireland 2020’ (EPA 2021a) details the range and scope of monitoring undertaken throughout Ireland.

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland for air quality management and assessment purposes as outlined within the EPA document titled ‘Air Quality In Ireland 2020’ (EPA 2021a). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000 is defined as Zone D. In terms of air monitoring, the area of the proposed development is categorised as Zone C.

In 2020 the EPA reported (EPA 2021a) that Ireland was compliant with EU legal limits at all locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA report details the effect that the Covid-19 restrictions had on stations, which included reductions of up to 50% at some monitoring stations which have traffic as a dominant source. The report also notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. For this reason, they have not been included in the receiving environment section.

<sup>30</sup> Met Eireann, 2022

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### 9.3.2.1 NO<sub>2</sub>

Long-term NO<sub>2</sub> monitoring was carried out at the Zone C locations of Kilkenny, Portlaoise and Dundalk for the period 2015 - 2019 (EPA, 2021a). Long term average concentrations are significantly below the annual average limit of 40 µg/m<sup>3</sup>. Average results range from 5 – 14 µg/m<sup>3</sup>. The NO<sub>2</sub> annual average for this five-year period suggests an upper average limit of no more than 13 µg/m<sup>3</sup> (Table 9.2) as a background concentration for the Zone C locations. Based on the above information a conservative estimate of the current background NO<sub>2</sub> concentration for the region of the proposed development is 14 µg/m<sup>3</sup>.

**Table 9.2 Background NO<sub>2</sub> Concentrations In Zone C Locations (µg/m<sup>3</sup>)**

| Station    | Averaging Period<br>Note 1                       | Year |      |      |      |      |
|------------|--------------------------------------------------|------|------|------|------|------|
|            |                                                  | 2015 | 2016 | 2017 | 2018 | 2019 |
| Kilkenny   | Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> ) | 5    | 7    | 5    | 6    | 5    |
|            | Max 1-hr NO <sub>2</sub> (µg/m <sup>3</sup> )    | 70   | 51   | 58   | 71   | 59   |
| Portlaoise | Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> ) | 10   | 11   | 11   | 11   | 11   |
|            | Max 1-hr NO <sub>2</sub> (µg/m <sup>3</sup> )    | 84   | 86   | 80   | 119  | 77   |
| Dundalk    | Annual Mean NO <sub>2</sub> (µg/m <sup>3</sup> ) | -    | -    | -    | 14   | 12   |
|            | Max 1-hr NO <sub>2</sub> (µg/m <sup>3</sup> )    | -    | -    | -    | 91   | 144  |

Note 1 Annual average limit value of 40 µg/m<sup>3</sup> and hourly limit value of 200 µg/m<sup>3</sup> (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

### 9.3.2.2 PM<sub>10</sub>

Continuous PM<sub>10</sub> monitoring was carried out at the Zone C locations of Galway, Ennis, Portlaoise and Dundalk from 2015 - 2019. These showed an upper average limit of no more than 18 µg/m<sup>3</sup> (Table 9.3). Levels range from 10 – 18 µg/m<sup>3</sup> over the five-year period with at most 12 exceedances of the 24-hour limit value of 50 µg/m<sup>3</sup> in Ennis in 2019 (35 exceedances are permitted per year) (EPA, 2021a). Based on the EPA data, a conservative estimate of the current background PM<sub>10</sub> concentration in the region of the proposed development is 15 µg/m<sup>3</sup>.

**Table 9.3 Background PM<sub>10</sub> Concentrations In Zone C Locations (µg/m<sup>3</sup>)**

| Station    | Averaging Period<br>Note 1                        | Year |      |      |      |      |
|------------|---------------------------------------------------|------|------|------|------|------|
|            |                                                   | 2015 | 2016 | 2017 | 2018 | 2019 |
| Galway     | Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> ) | 15   | 15   | -    | 15   | 13   |
|            | 24-hr Mean > 50 µg/m <sup>3</sup> (days)          | 2    | 3    | -    | 0    | 0    |
| Ennis      | Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> ) | 18   | 17   | 16   | 16   | 18   |
|            | 24-hr Mean > 50 µg/m <sup>3</sup> (days)          | 10   | 12   | 9    | 4    | 12   |
| Portlaoise | Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> ) | 12   | 12   | 10   | 11   | 15   |
|            | 24-hr Mean > 50 µg/m <sup>3</sup> (days)          | 1    | 1    | 0    | 1    | 0    |
| Dundalk    | Annual Mean PM <sub>10</sub> (µg/m <sup>3</sup> ) | -    | -    | -    | 15   | 14   |
|            | 24-hr Mean > 50 µg/m <sup>3</sup> (days)          | -    | -    | -    | 0    | 2    |

Note 1 Annual average limit value of 40 µg/m<sup>3</sup> and 24-hour limit value of 50 µg/m<sup>3</sup> (EU Council Directive 2008/50/EC & S.I. No. 180 of 2011).

### 9.3.2.3 PM<sub>2.5</sub>

Monitoring of both PM<sub>10</sub> and PM<sub>2.5</sub> takes place at the station in Ennis which allows for the PM<sub>2.5</sub>/PM<sub>10</sub> ratio to be calculated. Average PM<sub>2.5</sub> levels in Ennis over the period 2015 - 2019 ranged from 10 – 14 µg/m<sup>3</sup>, with a PM<sub>2.5</sub>/PM<sub>10</sub> ratio ranging from 0.63 – 0.78 (EPA, 2021a). Based on this information, a conservative ratio of 0.8 was used to generate an existing PM<sub>2.5</sub> concentration in the region of the development of 12 µg/m<sup>3</sup>.

### 9.3.3 CLIMATE BASELINE

Anthropogenic emissions of greenhouse gases in Ireland included in the EU 2020 strategy are outlined in the most recent review by the EPA which details provisional emissions up to 2020 (EPA, 2021b). The data published in 2021 states that Ireland will exceed its 2020 annual limit set under the EU's Effort Sharing Decision (ESD), 406/2009/EC1 by an estimated 6.73 Mt. For 2021, total national greenhouse gas emissions are estimated to be 57.70 million tonnes carbon dioxide equivalent (Mt CO<sub>2</sub>eq) with 44.38 MtCO<sub>2</sub>eq of emissions associated with the ESD sectors for which compliance with the EU targets must be met. Agriculture is the largest contributor in 2021 at 37.1% of the total, with the transport sector accounting for 17.9% of emissions of CO<sub>2</sub>.

GHG emissions for 2020 are estimated to be 3.6% lower than those recorded in 2019. Emission reductions have been recorded in 6 of the last 10 years. However, compliance with the annual EU targets has not been met for five years in a row. Emissions from 2016 – 2020 exceeded the annual EU targets by 0.29 MtCO<sub>2</sub>eq, 2.94 MtCO<sub>2</sub>eq, 5.57 MtCO<sub>2</sub>eq, 6.85 MtCO<sub>2</sub>eq and 6.73 MtCO<sub>2</sub>eq respectively. Agriculture is consistently the largest contributor to emissions with emissions from the transport and energy sectors being the second and third largest contributors respectively in recent years.

The EPA 2022 GHG Emissions Projections Report for 2021 – 2040 (EPA, 2022) provides an assessment of Ireland's total projected greenhouse gas (GHG) emissions from 2021 to 2040, using the latest inventory data for 2020 and provides an assessment of Ireland's progress towards achieving its National ambitions under the Climate Action and Low Carbon Development (Amendment) Act 2021 (Government of Ireland, 2021) and EU emission reduction targets for 2030 as set out under the EU Effort Sharing Regulation (ESR) 2018/842. Two scenarios are assessed – a "With Existing Measures" (WEM) scenario, which is a projection of future emissions based on the measures currently implemented and actions committed to by Government, and a "With Additional Measures" (WAM) scenario, which is the projection of future emissions based on the measures outlined in the latest Government plans at the time projections are compiled. This includes all policies and measures included in the WEM scenario, plus those included in government plans but not yet implemented.

The EPA report states under the "With Existing Measures" scenario, the projections indicate that Ireland will cumulatively exceed its ESR emissions allocation by 52.3 Mt CO<sub>2</sub> eq over the 2021-2030 period even with full use of the flexibilities available. Under the "With Additional Measures scenario", the projections indicate that Ireland can achieve compliance under the ESR over the 2021-2030 period using both flexibilities but only with full implementation of the 2021 Climate Action Plan. Both projected scenarios indicate that implementation of all climate plans and policies, plus further new measures, are needed for Ireland to meet the 51 per cent emissions reduction target and put the country on track for climate neutrality by 2050 (EPA, 2022).

### 9.3.4 SENSITIVITY OF THE RECEIVING ENVIRONMENT

In line with the IAQM guidance document (2014) prior to assessing the impact of dust from a proposed development, the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time, schools and hospitals. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are places where people are present for short periods or do not expect a high level of amenity.

In terms of receptor sensitivity to dust soiling, there are approximately 10 no. residential receptors within 100 m of the proposed works area. Intel Leixlip Campus is within 100 m of the proposed development and is classified as a medium sensitivity receptor. Based on the IAQM criteria outlined in Table 9.4, combining the 10-100 high sensitivity receptor category within 100 m of the proposed development, the worst case sensitivity of the area to dust soiling is considered low.

**Table 9.4 Sensitivity of the Area to Dust Soiling Effects on People and Property**

| Receptor Sensitivity | Number Of Receptors | Distance from source (m) |        |        |      |
|----------------------|---------------------|--------------------------|--------|--------|------|
|                      |                     | <20                      | <50    | <100   | <350 |
| High                 | >100                | High                     | High   | Medium | Low  |
|                      | 10-100              | High                     | Medium | Low    | Low  |
|                      | 1-10                | Medium                   | Low    | Low    | Low  |
| Medium               | >1                  | Medium                   | Low    | Low    | Low  |
| Low                  | >1                  | Low                      | Low    | Low    | Low  |

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM<sub>10</sub> concentration, receptor sensitivity based on type and the number of receptors affected within various distance bands from the proposed demolition and construction works. A conservative estimate of the current annual mean PM<sub>10</sub> concentration in the vicinity of the proposed development is 15 µg/m<sup>3</sup> and there are also approximately 10 no. high sensitivity properties and Intel Leixlip Campus which is a medium sensitivity building within 100m of the proposed development. Based on the IAQM criteria outlined in Table 9.5, the worst case sensitivity of the area to human health impacts is considered low.

**Table 9.5 Sensitivity of the Area to Human Health Impacts**

| Receptor Sensitivity | Annual Mean PM <sub>10</sub> Concentration | Number Of Receptors | Distance from source (m) |     |      |      |      |
|----------------------|--------------------------------------------|---------------------|--------------------------|-----|------|------|------|
|                      |                                            |                     | <20                      | <50 | <100 | <200 | <350 |
| High                 | < 24 µg/m <sup>3</sup>                     | >100                | Medium                   | Low | Low  | Low  | Low  |
|                      |                                            | 10-100              | Low                      | Low | Low  | Low  | Low  |
|                      |                                            | 1-10                | Low                      | Low | Low  | Low  | Low  |
| Medium               | < 24 µg/m <sup>3</sup>                     | >10                 | Low                      | Low | Low  | Low  | Low  |
|                      |                                            | 1-10                | Low                      | Low | Low  | Low  | Low  |
| Low                  | < 24 µg/m <sup>3</sup>                     | >1                  | Low                      | Low | Low  | Low  | Low  |

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to ecological impacts from dust. The criteria take into consideration whether the receiving environment is classified as a Special Area of Conservation (SAC), a Special Protected Area (SPA), a Natural Heritage Area (NHA) or a proposed Natural Heritage Area (pNHA) as dictated by the EU Habitats Directive or whether the site is a local nature reserve or home to a sensitive plant or animal species. The proposed development site is located in the immediate vicinity of the Rye Water Valley/Carlton pNHA and SAC (site code: 001398) which is a high sensitivity receptor. Due to the linear nature of the proposed development, only certain points of the works area are within 20 m of the ecological area. However, the overhead line crosses the River Rye between Tower 6 and Tower 7 as a result, worst case the overall sensitivity can be deemed as high.

**Table 9.6 Sensitivity of the Area to Ecological Impacts**

| Receptor Sensitivity | Distance from source (m) |        |
|----------------------|--------------------------|--------|
|                      | <20                      | <50    |
| High                 | High                     | Medium |
| Medium               | Medium                   | Low    |
| Low                  | Low                      | Low    |

## 9.4 PREDICTED EFFECTS

### 9.4.1 DEMOLITION/CONSTRUCTION PHASE

#### 9.4.1.1 Air Quality

The greatest potential impact on air quality during the construction phase of the proposed development is from demolition and construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 350 m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Casement Aerodrome meteorological data (see Section 9.3.1) indicates that the prevailing wind direction is south-westerly and wind speeds are generally moderate in nature. In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30 year average data for Casement Aerodrome meteorological station indicates that on average 183 days per year have rainfall over 0.2 mm (Met Eireann, 2022) and therefore it can be determined that over 50% of the time dust generation will be reduced naturally.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 9.3.4). As per Section 9.1.2.1 the major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (movement of heavy vehicles).

#### Demolition

The proposed development includes the dismantling of 4 no. suspension towers. However, this will not result in any dust emissions and as such have been scoped out of this analysis.

#### Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total site area > 10,000 m<sup>2</sup>, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved >100,000 tonnes;
- **Medium:** Total site area 2,500 m<sup>2</sup> – 10,000 m<sup>2</sup>, moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 8 m in height, total material moved 20,000 – 100,000 tonnes;
- **Small:** Total site area < 2,500 m<sup>2</sup>, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

The dust emission magnitude for the proposed earthwork activities can be classified as small as less than 20,000 tonnes of material are required for excavation. As outlined in Table 9.7, combining the small dust magnitude category with a low sensitivity to dust soiling and human health effects results in an overall negligible risk of dust soiling impacts and human health impacts. There is a low risk of ecological impacts as a result of the proposed earthworks activities as the overall sensitivity in relation to ecology is low (see Section 9.3.4).

**Table 9.7 Risk of Dust Impacts – Earthworks**

| Sensitivity of Area | Dust Emission Magnitude |             |            |
|---------------------|-------------------------|-------------|------------|
|                     | Large                   | Medium      | Small      |
| High                | High Risk               | Medium Risk | Low Risk   |
| Medium              | Medium Risk             | Medium Risk | Low Risk   |
| Low                 | Low Risk                | Low Risk    | Negligible |

### Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** Total building volume > 100,000 m<sup>3</sup>, on-site concrete batching, sandblasting;
- **Medium:** Total building volume 25,000 m<sup>3</sup> – 100,000 m<sup>3</sup>, potentially dusty construction material (e.g. concrete), on-site concrete batching;
- **Small:** Total building volume < 25,000 m<sup>3</sup>, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude for the proposed construction activities can be classified as small as there are no building to be constructed and the construction will be limited to steel towers which have a low potential for dust release and no on-site concrete batching will take place. As outlined in Table 9.8, this results in an overall negligible risk of dust soiling impacts and human health impacts and a low risk of ecological impacts as a result of the proposed construction activities.

**Table 9.8 Risk of Dust Impacts – Construction**

| Sensitivity of Area | Dust Emission Magnitude |             |            |
|---------------------|-------------------------|-------------|------------|
|                     | Large                   | Medium      | Small      |
| High                | High Risk               | Medium Risk | Low Risk   |
| Medium              | Medium Risk             | Medium Risk | Low Risk   |
| Low                 | Low Risk                | Low Risk    | Negligible |

### Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

- **Large:** > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;
- **Medium:** 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;
- **Small:** < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

The dust emission magnitude for the proposed trackout can be classified as medium, as at worst-case peak periods there will be no more than 50 HGV movements per day. As outlined in Table 9.9, this results in an overall low risk of dust soiling impacts and human health impacts and medium risk of ecological impacts as a result of the proposed trackout activities.

**Table 9.9 Risk of Dust Impacts – Trackout**

| Sensitivity of Area | Dust Emission Magnitude |             |            |
|---------------------|-------------------------|-------------|------------|
|                     | Large                   | Medium      | Small      |
| High                | High Risk               | Medium Risk | Low Risk   |
| Medium              | Medium Risk             | Medium Risk | Low Risk   |
| Low                 | Low Risk                | Low Risk    | Negligible |

#### Summary of Dust Emission Risk

The risk of dust impacts as a result of the proposed development are summarised in Table 9.10 for each activity. The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity in order to prevent significant impacts occurring.

Overall, in order to ensure that no dust nuisance occurs during the earthworks, construction and trackout activities, a range of dust mitigation measures associated with a medium risk of dust impacts will be implemented. In the absence of mitigation dust soiling impacts from demolition and construction works are predicted to be short-term, localised, negative and slight.

**Table 9.10 Summary of Dust Impact Risk used to Define Site-Specific Mitigation**

| Potential Impact        | Dust Emission Risk |                 |                 |             |
|-------------------------|--------------------|-----------------|-----------------|-------------|
|                         | Demolition         | Earthworks      | Construction    | Trackout    |
| Dust Emission Magnitude | -                  | Small           | Small           | Medium      |
| Dust Soiling Risk       | -                  | Negligible Risk | Negligible Risk | Low Risk    |
| Human Health Risk       | -                  | Negligible Risk | Negligible Risk | Low Risk    |
| Ecological Risk         | -                  | Low Risk        | Low Risk        | Medium Risk |

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase. Particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the proposed development satisfy the DMRB assessment criteria in Section 9.1.2.1. It can therefore be determined that the construction stage traffic will have an imperceptible, neutral and not significant short-term impact on air quality.

#### 9.4.1.2 Climate

There is the potential for a number of greenhouse gas emissions to atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO<sub>2</sub> and N<sub>2</sub>O emissions. The Institute of Air Quality Management document *Guidance on the Assessment of Dust from Demolition and Construction* (IAQM, 2014) states that site traffic and plant is unlikely to make a significant impact on climate. Therefore, the potential impact on climate is considered to be imperceptible, neutral, not significant and short-term.

#### 9.4.1.3 Human Health

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM<sub>10</sub> and PM<sub>2.5</sub> emissions. As per Section 9.3.4 and Table 9.5 the area is of low sensitivity to human health impacts from construction dust emissions. There is at most a negligible risk of human health impacts as a result of construction phase of the proposed development. Therefore, in the absence of mitigation there is the potential for imperceptible, negative, short-term non-significant impacts to human health as a result of the proposed development.

### 9.4.2 OPERATIONAL PHASE

Due to the nature of the proposed development impacts to air quality and climate are not predicted for the operational phase as there will be no emissions to atmosphere associated with the development. The operational phase will be neutral in relation to both air quality and climate.

## 9.5 MITIGATION AND MONITORING MEASURES

### 9.5.1 CONSTRUCTION PHASE

There is the potential for a number of impacts to air quality and climate during the construction phase of the proposed development. Construction dust emissions are considered the primary source of air quality impacts associated with the proposed development. It has been established that there is an overall low risk of dust related impacts as a result of the proposed development. It must be ensured that dust emissions are mitigated to prevent significant impacts occurring. To avoid any potential significant impacts the following mitigation measures have been proposed.

#### 9.5.1.1 Air Quality

The proactive control of fugitive dust will ensure the prevention of significant emissions. The key aspects of controlling dust are listed below. Full details of the dust management plan can be found in Appendix 9.1. The dust minimisation measures will be incorporated into the overall Construction Environmental Management Plan (CEMP) being prepared in relation to the development. In summary the measures which will be implemented will include:

- Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic.
- Any road that has the potential to give rise to fugitive dust will be regularly watered, as appropriate, during dry and/or windy conditions.
- Vehicles exiting the site shall make use of a wheel wash facility prior to entering onto public roads.
- Vehicles using site roads will have their speed restricted, and this speed restriction must be enforced rigidly. On any un-surfaced site road, this will be 20 kph.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- During movement of materials both on and off-site, trucks will be stringently covered with tarpaulin at all times. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.

At all times, these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Monitoring of construction dust deposition along the site boundary to nearby sensitive ecological receptors (Rye Water Valley/Carton pNHA and SAC) during the construction phase of the proposed development is recommended to ensure mitigation measures are working satisfactorily. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2 m above ground level. The TA Luft limit value is 350 mg/(m<sup>2</sup>\*day) during the monitoring period of 30 days (+/- 2 days).

### 9.5.1.2 Climate

Impacts to climate during the construction stage are predicted to be imperceptible however, good practice measures can be incorporated to ensure potential impacts are lessened. These include:

- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.

### 9.5.2 OPERATIONAL STAGE

There is no monitoring recommended for the operational phase as it is predicted to have a neutral impact on air quality and climate.

## 9.6 RESIDUAL IMPACTS

### 9.6.1 CONSTRUCTION PHASE

#### 9.6.1.1 Air Quality

It has been established that in the absence of mitigation there is an overall low risk of dust soiling impacts and human health impacts and a medium risk of ecological impacts as a result of the construction phase of the proposed development (see Section 9.4.1.1). Due to the presence of the high sensitivity receptor of Rye Water Valley/Carton pNHA and SAC within 20m of the proposed development boundary, a detailed dust management plan has been formulated to mitigate potential dust impacts. The plan draws on best practice measures from Ireland, the UK and the USA. Once the dust minimisation measures outlined in Section 9.5 and Appendix 9.1 are implemented, the impact of the proposed development in terms of dust soiling will be short-term, negative, localised, non-significant and imperceptible at nearby receptors.

#### 9.6.1.2 Climate

According to the IAQM guidance (2014) site traffic, plant and machinery are unlikely to have a significant impact on climate. Therefore the predicted impact is short-term, non-significant, neutral and imperceptible.

#### 9.6.1.3 Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development is likely to be negative, short-term, non-significant and imperceptible with respect to human health.

### 9.6.2 OPERATIONAL STAGE

Due to the nature of the proposed development impacts to air quality and climate are not predicted for the operational phase as there will be no emissions to atmosphere associated with the development. The operational phase will be neutral in relation to both air quality and climate.

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28 NOV 2022

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## 9.7 CUMULATIVE IMPACT

### 9.7.1 CONSTRUCTION PHASE

According to the IAQM guidance (2014) should the construction phase of the proposed development coincide with the demolition/construction of any other permitted developments within 350 m of the site then there is the potential for cumulative dust impacts to the nearby sensitive receptors.

There is the potential for cumulative construction dust impacts to occur if the construction phase of the proposed development overlaps with the current construction works taking place at the Intel Leixlip Campus. This construction is within 350 m of the proposed development site boundary and is actively undertaking construction works, therefore cumulative construction dust impacts may occur. The dust mitigation measures outlined within Section 9.5 and Appendix 9.1 of this chapter will prevent significant dust emissions from occurring and therefore significant cumulative impacts are not predicted. Cumulative impacts during the construction phase are likely to be short-term, negative, non-significant and imperceptible.

### 9.7.2 OPERATIONAL PHASE

No cumulative impacts are predicted during the operational phase of the proposed development.

## 9.8 INTERACTIONS

Air quality does not have a significant number of interactions with other topics. The primary interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures (see Appendix 9.1) that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits and therefore the predicted impact is short-term and imperceptible with respect to human health.

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in AADT on roads close to the site. Applying this analysis to this assessment however, the impact of the interactions between traffic and air quality during the construction phase is considered imperceptible.

A detailed traffic assessment was scoped out as the traffic generated by the development did not reach the DMRB scoping criteria. Changes in air quality are assessed against the Ambient Air Quality Standards which are based on the protection of human health. Therefore if the change in pollutant levels is considered imperceptible the impact to human health will be imperceptible.

With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils. No other noteworthy interactions with air quality and climate have been identified.

# 10 NOISE & VIBRATION

## 10.1 INTRODUCTION/METHODOLOGY

This chapter assesses the likely noise and vibration effects associated with the proposed development at Intel Campus, Collinstown, Leixlip, Co. Kildare. A full description of the development can be found in Chapter 4 *Project Description*. This document was prepared by AWN Consulting Ltd (AWN) to assess the potential noise and vibration effects of the proposed development in the context of current relevant standards and guidance.

This report includes a description of the receiving ambient noise climate in the vicinity of the subject site and an assessment of the potential noise and vibration effect associated with the proposed development on its surrounding environment, during both the short-term construction phase and the long-term operational phase. The assessment of direct, indirect and cumulative noise and vibration effects on the surrounding environment have been considered as part of the assessment.

Mitigation measures are included, where relevant, to ensure the proposed development is constructed and operated in a manner that minimises effects on the receiving environment.

Appendix 10.1 presents a glossary of the acoustic terminology used throughout this document. In the first instance it is considered appropriate to review some basic fundamentals of acoustics.

### 10.1.1 FUNDAMENTALS OF ACOUSTICS

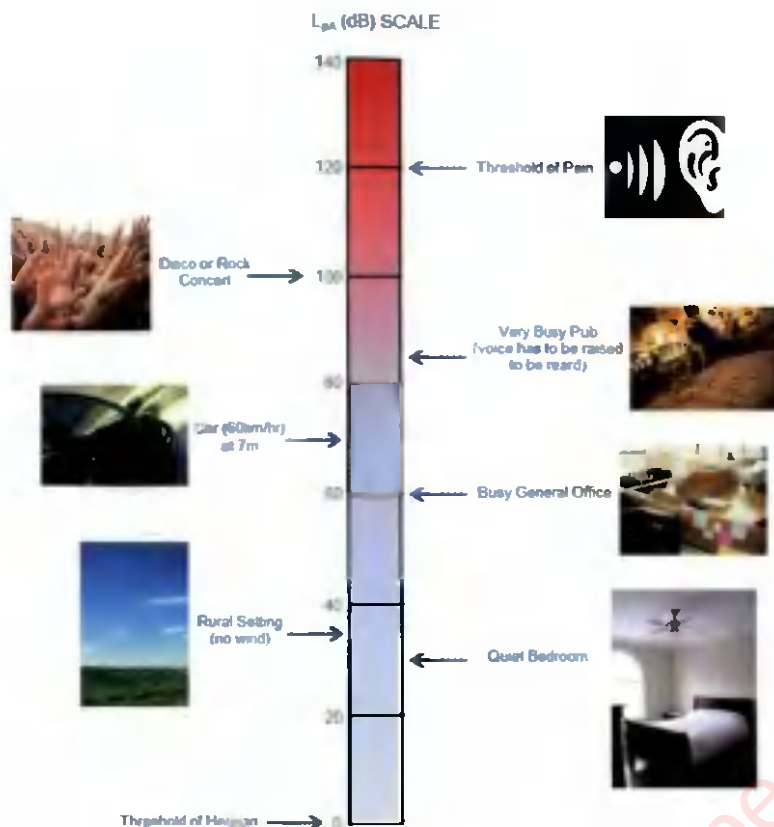
In order to provide a broader understanding of some of the technical discussion in this report, this section provides a brief overview of the fundamentals of acoustics and the basis for the preparation of this noise assessment.

A sound wave travelling through the air is a regular disturbance of the atmospheric pressure. These pressure fluctuations are detected by the human ear, producing the sensation of hearing. In order to take account of the vast range of pressure levels that can be detected by the ear, it is convenient to measure sound in terms of a logarithmic ratio of sound pressures. These values are expressed as Sound Pressure Levels (SPL) in decibels (dB).

The audible range of sounds expressed in terms of Sound Pressure Levels is 0dB (for the threshold of hearing) to 120dB (for the threshold of pain). In general, a subjective impression of doubling of loudness corresponds to a tenfold increase in sound energy which conveniently equates to a 10dB increase in SPL. It should be noted that a doubling in sound energy (such as may be caused by a doubling of traffic flows) increases the SPL by 3dB.

The frequency of sound is the rate at which a sound wave oscillates, and is expressed in Hertz (Hz). The sensitivity of the human ear to different frequencies in the audible range is not uniform. For example, hearing sensitivity decreases markedly as frequency falls below 250 Hz. In order to rank the SPL of various noise sources, the measured level has to be adjusted to give comparatively more weight to the frequencies that are readily detected by the human ear. Several weighting mechanisms have been proposed but the 'A-weighting' system has been found to provide one of the best correlations with perceived loudness. SPL's measured using 'A-weighting' are expressed in terms of dB(A). An indication of the level of some common sounds on the dB(A) scale is presented in Figure 10.1.

The 'A' subscript denotes that the sound levels have been A-weighted. The established prediction and measurement techniques for this parameter are well developed and widely applied. For a more detailed introduction to the basic principles of acoustics, reference should be made to an appropriate standard text.



**Figure 10.1 dB(A) Scale & Indicative Noise Levels<sup>41</sup>**

### 10.1.2 ASSESSMENT METHODOLOGY

The assessment of effects has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out within the relevant sections of this report. In addition to specific guidance documents for the assessment of noise and vibration effects which are discussed further in the relevant sections, the following guidelines were considered and consulted for the purposes of this report:

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017); and
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – (EPA, 2022).

The study has been undertaken using the following methodology:

- Review of measured prevailing noise levels in the vicinity of the subject site in order to characterise the existing baseline noise environment;
- A review of the most applicable standards and guidelines has been conducted in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- Predictive calculations have been performed during the construction phase of the project at the nearest sensitive locations to the development site; and,
- Review of relevant information to assess the potential for effects associated with the operational phase of the development at the most sensitive locations surrounding the development site.

### 10.1.3 RELEVANT GUIDANCE: CONSTRUCTION PHASE

#### 10.1.3.1 Construction Noise

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local Authorities typically control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In the absence of specific noise limits, appropriate criteria relating to permissible construction noise levels for a development of this scale may be found in the Transport Infrastructure Ireland (TII) publication *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* which indicates the following Construction Noise Threshold and hours of operation.

**Table 10.1 Permissible Noise Levels at Facade of Dwellings during Construction**

| Days and Times                        | Noise Levels (dB re. 2x10 <sup>-5</sup> Pa) |                   |
|---------------------------------------|---------------------------------------------|-------------------|
|                                       | L <sub>Aeq</sub> (1hr)                      | L <sub>Amax</sub> |
| Monday to Friday 07:00hrs to 19:00hrs | 70                                          | 80                |
| Monday to Friday 19:00 to 22:00hrs    | 60                                          | 65                |
| Saturdays 08:00hrs to 14:00hrs        | 65                                          | 75                |

#### Interpretation of the CNT

In order to assist with interpretation of CNTs, Table 10.2 includes guidance as to the likely magnitude of effect associated with construction activities, relative to the CNT. This guidance is derived from Table 3.16 of *DMRB: Noise and Vibration* and adapted to include the relevant significance effects from the *EPA Guidelines* (EPA 2022).

**Table 10.2 Construction Noise Significance Ratings**

| Guidelines for Noise Impact Assessment Significance (DMRB) | CNT per Period                                       | EPA EIAR Significance Effects    | Determination                                     |
|------------------------------------------------------------|------------------------------------------------------|----------------------------------|---------------------------------------------------|
| Negligible                                                 | Below or equal to baseline noise level               | Not Significant                  | Depending on CNT, duration & baseline noise level |
| Minor                                                      | Above baseline noise level and below or equal to CNT | Slight to Moderate               |                                                   |
| Moderate                                                   | Above CNT and below or equal to CNT +5 dB            | Moderate to Significant          |                                                   |
| Major                                                      | Above CNT +5 to +15 dB                               | Significant, to Very Significant |                                                   |
|                                                            | Above CNT +15 dB                                     | Very Significant to Profound     |                                                   |

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and comment on the likely effects during the construction stages.

### Construction Traffic

In order to assist with the interpretation of construction traffic noise, Table 10.3 includes guidance as to the likely magnitude of effect associated with changes in traffic noise levels along an existing road. This is taken from Table 3.17 of the *DMRB Noise and Vibration* (UKHA 2020).

**Table 10.3 Likely Effect Associated with Change in Traffic Noise Level, Construction Phase**

| Magnitude of Impact | Increase in Traffic Noise Level (dB)           |
|---------------------|------------------------------------------------|
| Negligible          | Less than 1.0                                  |
| Minor               | Greater than or equal to 1.0 and less than 3.0 |
| Moderate            | Greater than or equal to 3.0 and less than 5.0 |
| Major               | Greater than or equal to 5.0                   |

In accordance with the *DMRB Noise and Vibration*, construction noise and construction traffic noise effects shall constitute a significant effect where it is determined that a major or moderate magnitude of effect will occur for a duration exceeding:

- Ten or more days or night in any 15 consecutive day or nights;
- A total number of days exceeding 40 in any six consecutive months.

### 10.1.3.2 Construction Vibration

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, it is appropriate to consider the magnitude of vibration in terms of Peak Particle Velocity (PPV).

#### Building Damage

British Standard BS 5228-2:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Vibration* recommends that, for soundly constructed residential property and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e., non-structural) damage should be taken as a peak component particle velocity (in frequency range of predominant pulse) of 15 mm/s at 4Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. The standard also notes that below 12.5 mm/s PPV the risk of damage tends to zero. It is therefore common, on a cautious basis to use this lower value. Taking the above into consideration the vibration criteria in Table 10.4 are recommended.

Further guidance relevant to acceptable vibration within buildings is contained in the following documents:

- British Standard BS 7385: 1993: *Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration*, and;
- British Standard BS 5228-2: 2009+A1:2014: *Code of practice for noise and vibration control on construction and open sites – Vibration*.

BS 7385 states that there should typically be no cosmetic damage if transient vibration does not exceed 15 mm/s at low frequencies rising to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above. These guidelines relate to relatively modern buildings and should be reduced to 50% or less for more critical buildings.

Where continuous vibration is such as to give rise to dynamic magnification due to resonance, the guide values may need to be reduced by up to 50%. BS 5288-2 also comments that important buildings which are difficult to repair might require special consideration on a case-by-case basis.

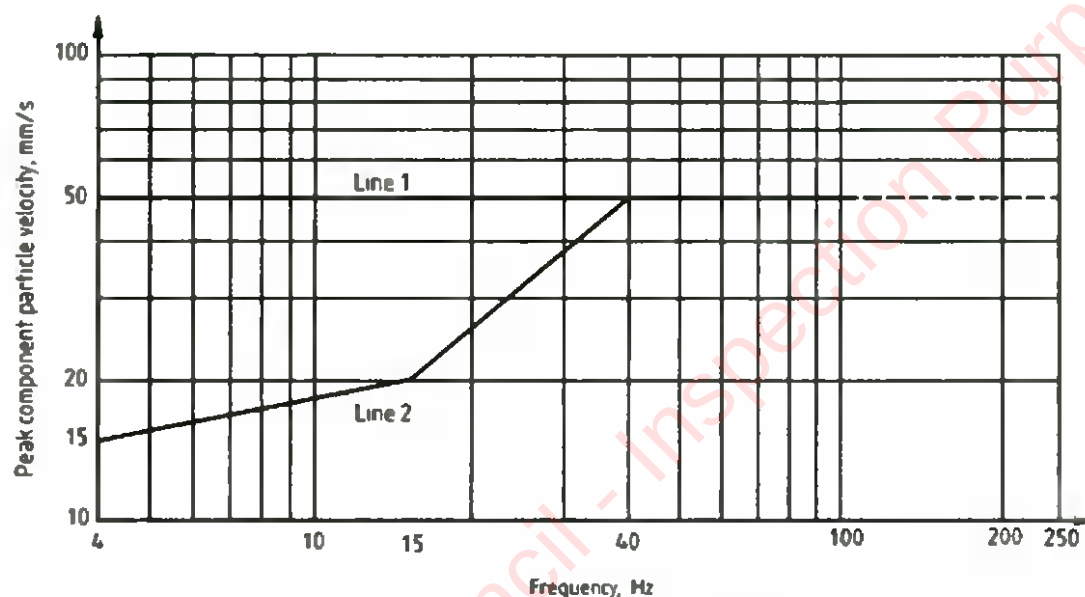
Suggested levels of allowable vibration (in terms of peak particle velocity) at the closest part of a sensitive property to the source of vibration are summarized in Table 10.4.

**Table 10.4 Transient Vibration Guide Values for Cosmetic Building Damage**

| Line (see Figure 10.2) | Type of Building                                                                         | Peak component particle velocity in frequency range of predominant pulse |                                                           |
|------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------|
|                        |                                                                                          | 4Hz to 15Hz                                                              | 15Hz and above                                            |
| 1                      | Reinforced or framed structures<br>Industrial and heavy commercial buildings.            | 50 mm/s at 4Hz and above                                                 |                                                           |
| 2                      | Unreinforced or light framed structures. Residential or light commercial building types. | 15 mm/s at 4Hz increasing to 20 mm/s at 15Hz                             | 20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above |

Notes:

- 1) Values referred to are at the base of the building.
- 2) For Line 2, at frequencies below 4Hz, a maximum displacement of 0.6 mm (zero to peak) should not be exceeded.

**Figure 10.2 Transient Vibration Guide Values for Cosmetic Damage**

The guide values contained in Table 10.4 relate to predominantly transient vibration which does not give rise to resonant responses in structures, and to low rise buildings.

#### Human Perception

It is acknowledged that humans are particularly sensitive to vibration stimuli and that any perception of vibration may lead to concern. In the case of traffic, vibration is perceptible at around 0.5 mm/s and may become disturbing or annoying at higher magnitudes. Higher levels of vibration, however, are typically tolerated for single events or events of short duration. For example, during piling, one of the primary sources of vibration during construction, vibration levels may typically be tolerated at up to 2.5 mm/s. This guidance is applicable to the daytime only; it is unreasonable to expect people to be tolerant to such activities during the night-time.

BS 5228-2 also provides a useful guide relating to the assessment of human response to vibration in terms of the peak particle velocity (PPV). Table 10.5 below summarises the range of vibration values and the associated potential effects on humans.

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**Table 10.5 Guidance on effects of human response to PPV magnitudes**

| Vibration Level, PPV | Effect                                                                                                                                                            |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 0.14 mm/s            | Vibration might be just perceptible in the most sensitive situations for most vibration frequencies. At lower frequencies people are less sensitive to vibration. |
| 0.3 mm/s             | Vibration might be just perceptible in residential environments.                                                                                                  |
| 1 mm/s               | It is likely that a vibration level of this magnitude in residential environments will cause complaint.                                                           |
| 10 mm/s              | Vibration is likely to be intolerable for any more than a brief exposure to this level                                                                            |

## 10.1.4 RELEVANT GUIDANCE: OPERATIONAL PHASE

### 10.1.4.1 Noise Criteria

The proposed scheme comprises installation of pylon towers and redirecting of existing power lines. There are no new plant items of operational sources of noise proposed, therefore potential noise effects are solely associated with the construction phase.

Discussion relating to the potential for noise associated with the power lines themselves is presented in Section 10.4.2.1.

### 10.1.4.2 Vibration Criteria

Guidance as to an acceptable magnitude of vibration during the operational phase of the development is best taken from British Standard BS 6472 (1992): *Guide to Evaluation of human exposure to vibration in buildings (1Hz to 80Hz)*. The Standard contains recommendations that continuous vibration in residential buildings should not exceed nominally 0.3 mm/s by daytime and 0.2 mm/s by night-time.

It should be noted that the proposed development will not give rise to any significant levels of vibration off site and therefore the associated effect is not significant.

## 10.2 THE PROPOSED DEVELOPMENT

The proposed developments aims to realign an approximate 1.1 km section of the existing Maynooth-Ryebrook 110 kV double circuit overhead line (OHL). The proposed OHL realignment will consist of the following principal elements:

- Diverting a section of the existing Maynooth-Ryebrook 110 kV double circuit OHL to the north of the River Rye, along the eastern edge of the Intel site at Collinstown, linking back into the existing OHL section at the Lidl car park to the immediate south of the R148;
- The installation of 7 No. new double circuit steel lattice towers and 2 No. replacements of existing double circuit towers ranging in height from approximately 20.75 m to 39.75 m above ground level supporting three electrical conductors and associated overhead line infrastructure;
- The decommissioning and removal of 4 No. existing towers and associated electrical conductors;
- Following diversion, the decommissioning and removal of the existing towers and associated electrical conductors from site
- All ancillary site development, preparation and reinstatement works, including access, landscaping and connection to existing services and utilities.

These issues are discussed in detail in the appropriate sections below.

## 10.3 THE RECEIVING ENVIRONMENT

### 10.3.1 BASELINE NOISE LEVELS

Noise monitoring is completed annually at noise sensitive locations surrounding the Intel site. Two sets of survey data are presented. Firstly, review of the 2018 noise survey is considered here as a means of reviewing the existing noise environment. Due to ongoing construction for the period 2019 onwards, the noise levels measured in 2018 are utilised as they are representative of the prevailing noise environment in the absence of construction noise.

Secondly, as construction has been ongoing over an extended period, its contribution is relevant to the makeup of the noise environment surrounding the Intel site. Measured noise levels from the most recent Industrial Emissions Licence (IEL) survey carried out by AWN in 2021, is presented below.

#### 10.3.1.1 Choice of Measurement Locations

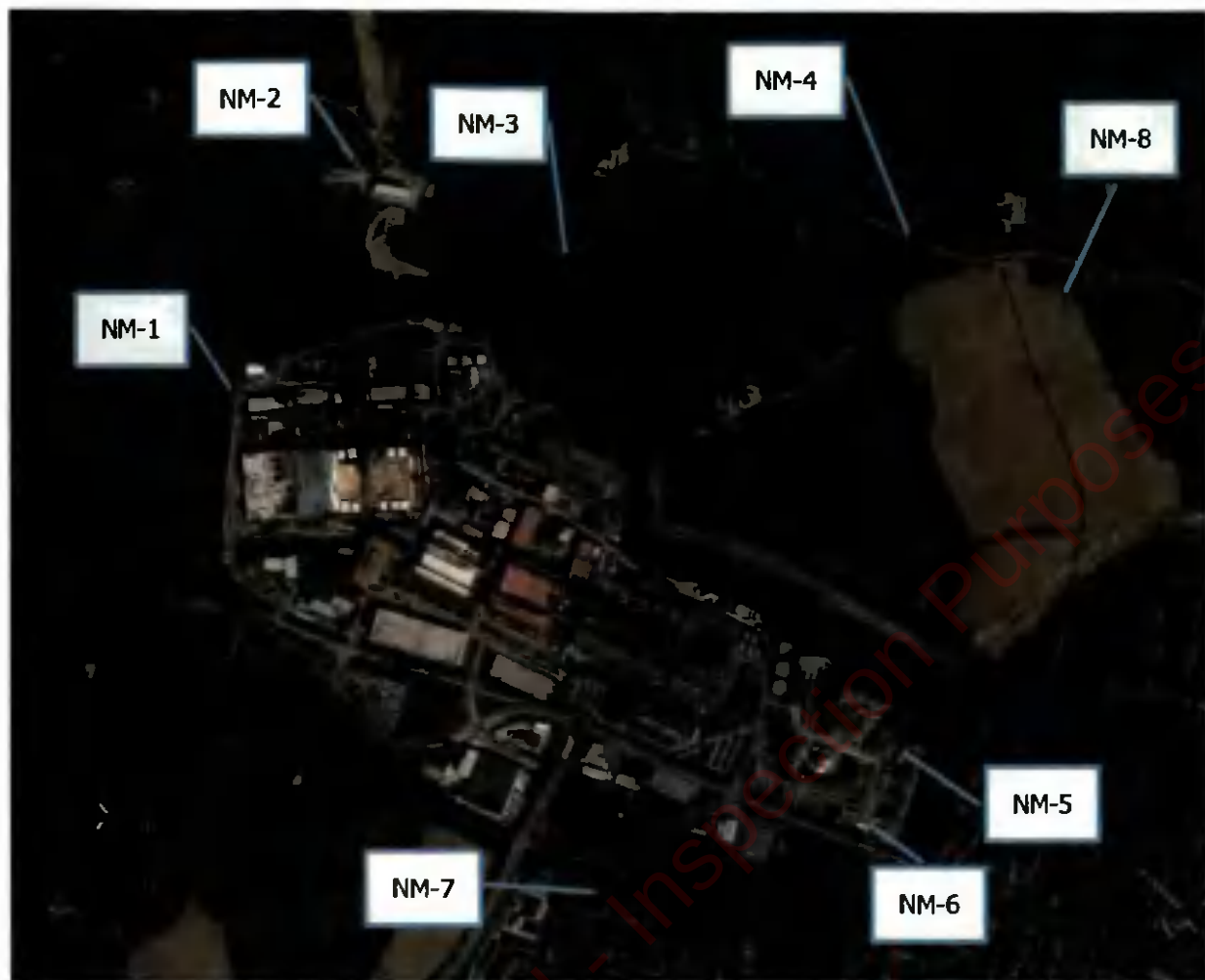
The environmental noise monitoring locations are described below and illustrated in Figure 10.3.

**Table 10.6 Noise Sensitive Locations & Descriptions**

| Location | Description                                                                                                                   | Coordinates |         | Notes                                                                                                                      |
|----------|-------------------------------------------------------------------------------------------------------------------------------|-------------|---------|----------------------------------------------------------------------------------------------------------------------------|
|          |                                                                                                                               | E           | N       |                                                                                                                            |
| NM-1     | Along Kellystown lane near the 'Middle Gate' on the western boundary of the site.                                             | 297,934     | 237,503 | Boundary Location – approx. 70m additional distance from monitoring location to nearest NSL.                               |
| NM-2     | Along the Dunboyne Road to the north of the site, at the entrance to the Intel soccer grounds.                                | 298,236     | 237,946 | Boundary Location. No residential housing in close proximity to this measurement position.                                 |
| NM-3     | At Riverview House to the north of the site.                                                                                  | 298,686     | 237,708 | The noise monitor was positioned adjacent to the Riverview property                                                        |
| NM-4     | Along the Dunboyne Road at Confey to the north of the site.                                                                   | 299,316     | 237,826 | The noise monitor was positioned at the entrance to a field adjacent to nearby residential properties                      |
| NM-5     | At the north-eastern Intel site boundary. The noise monitor was positioned in the corner of the car-park to the east of Fab24 | 299,331     | 236,701 | Boundary Location - approx. 220m additional distance from monitoring location to nearest NSL beyond railway line.          |
| NM-6     | At the south-eastern Intel site boundary. The noise monitor was positioned in the corner of the car-park to the east of Fab24 | 299,311     | 236,593 | Boundary Location - approx. 180m additional distance from monitoring location to nearest NSL beyond railway line           |
| NM-7     | At noise-sensitive locations beyond the southern boundary of the Intel site.                                                  | 298,708     | 236,480 | The monitoring position is to the rear of properties within Glen Easton Woods Estate at the boundary with the railway line |
| NM-8     | At a noise-sensitive location north-east of the site along Dunboyne Road at Confey.                                           | 299,658     | 237,691 | The monitoring position is in the rear garden of the dwelling.                                                             |

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**Figure 10.3 Noise Survey Locations**

#### **10.3.1.2 Measurement Procedure**

Measurements were conducted at the locations noted above. Sample periods for the noise measurements were 30 minutes during the daytime and evening, and 15 minutes during the night-time. The results were noted onto a Survey Record Sheet immediately following each sample and were also saved to the instrument memory for later analysis if required. Survey personnel noted the primary noise sources contributing to noise build-up.

#### **10.3.1.3 Survey Results**

This section documents the noise levels measured in the vicinity of the noise sensitive locations in closest proximity to the proposed development site.

#### **IEL Noise Survey 2018**

A summary of the results of the 2018 IEL Noise Survey is presented below

**Table 10.7 Noise Monitoring Results – Daytime**

| Location | Typical Range of Ambient Day Noise Level<br>dB LAeq,30min | Typical Range of Background Day Noise Level<br>dB LA90,30min |
|----------|-----------------------------------------------------------|--------------------------------------------------------------|
| NM-1     | 51 – 52                                                   | 41 – 44                                                      |
| NM-2     | 46 – 48                                                   | 37 – 38                                                      |
| NM-3     | 41 – 46                                                   | 33 – 36                                                      |
| NM-4     | 54 – 57                                                   | 32 – 36                                                      |
| NM-5     | 50                                                        | 46 – 47                                                      |
| NM-6     | 53 – 55                                                   | 49 – 51                                                      |
| NM-7     | 51 – 55                                                   | 47 – 51                                                      |
| NM-8     | 39 – 45                                                   | 32 – 33                                                      |

**Table 10.8 Noise Monitoring Results – Night-time**

| Location | Typical Range of Ambient Night Noise Level<br>dB LAeq,15min | Typical Range of Background Night Noise Level<br>dB LA90,15min |
|----------|-------------------------------------------------------------|----------------------------------------------------------------|
| NM-1     | 37 – 41                                                     | 32 – 33                                                        |
| NM-2     | 40 – 42                                                     | 35 – 39                                                        |
| NM-3     | 40 – 41                                                     | 38 – 40                                                        |
| NM-4     | 36 – 50                                                     | 27 – 29                                                        |
| NM-5     | 40 – 41                                                     | 38 – 39                                                        |
| NM-6     | 39 – 41                                                     | 35 – 36                                                        |
| NM-7     | 40 – 41                                                     | 35 – 36                                                        |
| NM-8     | 38 – 40                                                     | 36 – 39                                                        |

At locations NM-1, NM-2, NM-3, NM-4 and NM-8, noise levels are typically dictated by road traffic on Kellystown Lane, Confey Road and the M4 motorway in the distance. During lulls in traffic bird song and plant noise from the site is audible to varying degrees, depending on the location.

At locations NM-5 and NM-6, the noise environment comprised vehicle movements within the site, traffic noise from the R148 to the south, and faint plant noise from the site during periods of reduced activity and traffic.

#### IEL Noise Survey 2021

A summary of the results of the 2021 IEL Noise Survey is presented below.

**Table 10.9 Noise Monitoring Results – Daytime**

| Location | Typical Range of Ambient Day Noise Level<br>dB LAeq,30min | Typical Range of Background Day Noise Level<br>dB LA90,30min |
|----------|-----------------------------------------------------------|--------------------------------------------------------------|
| NM-1     | 65 – 69*                                                  | 51 – 54                                                      |
| NM-2     | 48 – 54                                                   | 39 – 43                                                      |
| NM-3     | 42 – 43                                                   | 39 – 40                                                      |
| NM-4     | 51 – 64                                                   | 35 – 47                                                      |
| NM-5     | 45 – 62*                                                  | 37 – 51                                                      |
| NM-6     | 48 – 55                                                   | 40 – 47                                                      |
| NM-7     | 48 – 51                                                   | 41                                                           |
| NM-8     | 39 – 43                                                   | 32 – 36                                                      |

Note \* Construction noise observed to be having a noticeable contribution to measured noise level.

**Table 10.10 Noise Monitoring Results – Night-time**

| <b>Location</b> | <b>Typical Range of Ambient Night Noise Level<br/>dB LAeq,15min</b> | <b>Typical Range of Background Night Noise Level<br/>dB LA90,15min</b> |
|-----------------|---------------------------------------------------------------------|------------------------------------------------------------------------|
| NM-1            | 52 – 61                                                             | 47 – 49                                                                |
| NM-2            | 48 – 54                                                             | 39 – 43                                                                |
| NM-3            | 44                                                                  | 43                                                                     |
| NM-4            | 37 – 49                                                             | 35 – 36                                                                |
| NM-5            | 45 – 46                                                             | 42 – 44                                                                |
| NM-6            | 46 – 48                                                             | 43 – 44                                                                |
| NM-7            | 45 – 46                                                             | 38 – 42                                                                |
| NM-8            | 41                                                                  | 36                                                                     |

As observed during the 2018 survey, at locations NM-1, NM-2, NM-3, NM-4 and NM-8, noise levels are typically dictated by road traffic on Kellystown Lane, Confey Road and the M4 motorway in the distance. During lulls in traffic bird song and plant noise from the site is audible to varying degrees, depending on the location.

During the daytime at NM-1 and NM-5, noise from construction contributed to measured noise levels.

At locations NM-5 and NM-6, the noise environment comprised vehicle movements within the site, traffic noise from the R148 to the south, and faint plant noise from the site during periods of reduced activity and traffic.

## 10.4 PREDICTED EFFECTS

### 10.4.1 CONSTRUCTION PHASE

It is predicted that the construction programme will create typical construction activity related noise on site. During the construction phase of the proposed development, a variety of items of plant will be in use, such as excavators, lifting equipment, dumper trucks, compressors and generators.

The proposed main construction hours are 07:00 to 19:00hrs on Mondays to Fridays and 08:00 to 14:00hrs on Saturdays.

Due to the nature of daytime activities undertaken on a construction site of this nature, there is potential for generation of significant levels of noise. The flow of vehicular traffic to and from a construction site is also a potential source of relatively high noise levels. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces. Due to the proximity of sensitive locations to site works however, there is little likelihood of structural or even cosmetic damage to existing neighbouring dwellings as a result of vibration.

Reference has been made to the Outline CEMP prepared by EIS. Details of proposed construction activity are set out in the document. The table below sets out reference noise levels for the proposed activities, making reference to information contained in BS5228.

**Table 10.11 Typical noise levels associated with construction plant items**

| Stage   | Activity                                                         | Item of Plant (BS 5228-1 Ref.)  | Construction Noise Level at 10m Distance (dB LAeq,1hr) |
|---------|------------------------------------------------------------------|---------------------------------|--------------------------------------------------------|
| 1       | Site Clearance & Preparation                                     | Tracked Excavator (C3.24)       | 74                                                     |
|         |                                                                  | Articulated lorry (C11.10)      | 77                                                     |
|         |                                                                  | Dump Truck (C4.2)               | 78                                                     |
|         |                                                                  | Surfacing (D8.25)               | 68                                                     |
| 2       | Tower Foundations                                                | Tracked Excavator (C3.24)       | 74                                                     |
|         |                                                                  | Mobile Telescopic Crane (C4.39) | 77                                                     |
|         |                                                                  | Concrete Pump (C3.25)           | 78                                                     |
|         |                                                                  | Poker Vibrator (C4.33)          | 78                                                     |
| 3 and 4 | Tower Assembly and Erection and Conductor/Insulator Installation | Articulated lorry (C11.10)      | 77                                                     |
|         |                                                                  | Hand tools                      | 81                                                     |
|         |                                                                  | Mobile Telescopic Crane (C4.39) | 77                                                     |
| 5       | Decommissioning and Reinstatement of Land                        | Tracked Excavator (C3.24)       | 74                                                     |
|         |                                                                  | Dump Truck (C4.2)               | 78                                                     |
|         |                                                                  | Hand tools                      | 81                                                     |
|         |                                                                  | Mobile Telescopic Crane (C4.39) | 77                                                     |

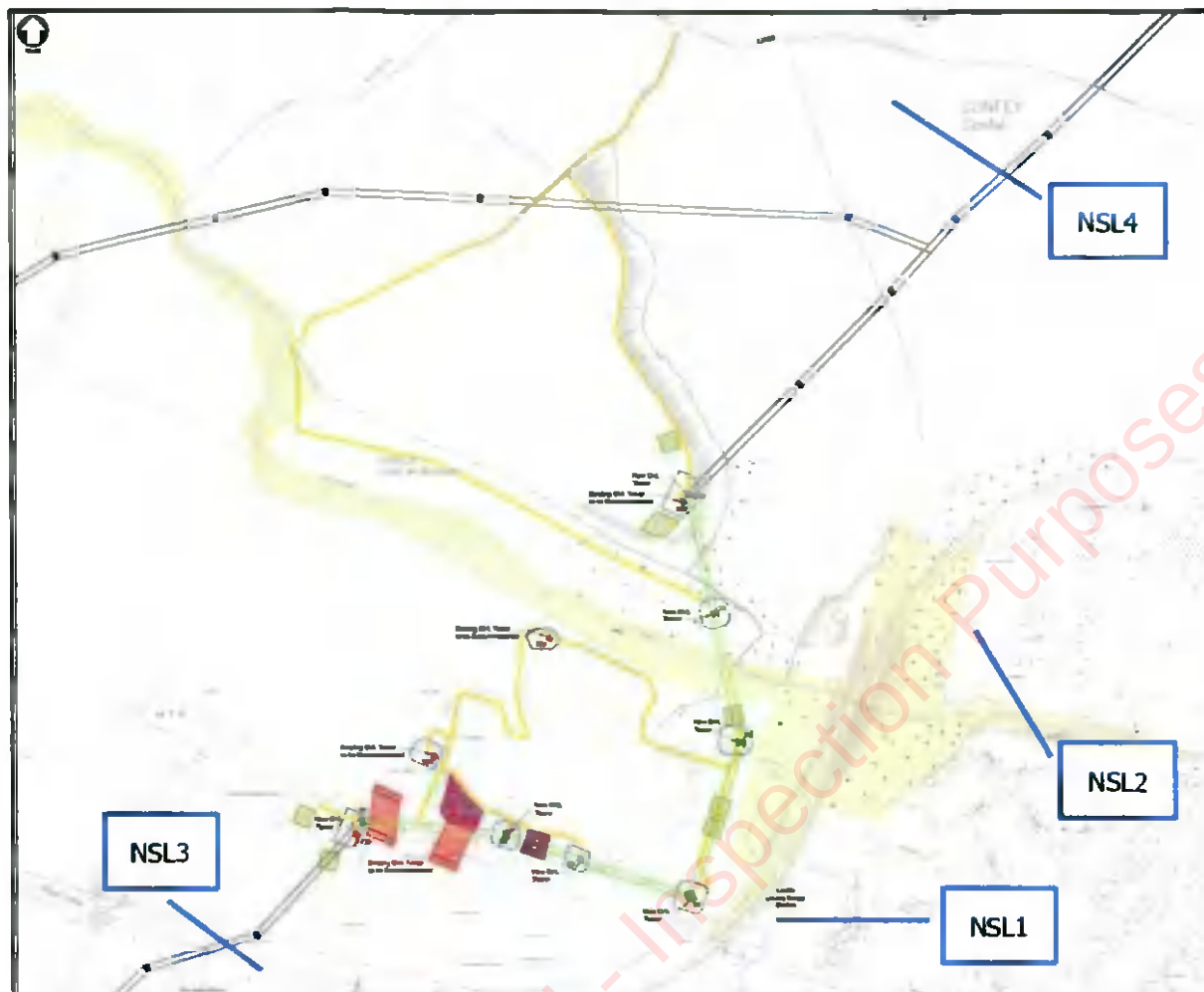
Table 10.12, overleaf, presents the predicted daytime noise levels for an indicative construction period on site. Construction noise sources are assumed to be running 66% of the time. The predictions have been prepared for a set of the nearest residential noise-sensitive locations to the site:

- NSL1 which represents houses and apartments approximately 115 m east of proposed tower T4;
- NSL2 which represents houses and apartments approximately 250 m east of proposed tower T5;
- NSL3 which represents houses approximately 240 m south of proposed tower T1; and
- NSL4 which represents houses approximately 640 m north east of proposed tower T7.

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**Figure 10.4 Noise Sensitive Locations**

**Table 10.12 Indicative Construction Noise Levels at Nearest Noise Sensitive Locations**

| Construction Phase                                                 | Item of Plant<br>(BS 5228-1 Ref)                    | L <sub>Aeq</sub> at distance (m) |                |                |                |
|--------------------------------------------------------------------|-----------------------------------------------------|----------------------------------|----------------|----------------|----------------|
|                                                                    |                                                     | NSL1<br>(115m)                   | NSL2<br>(250m) | NSL3<br>(240m) | NSL4<br>(640m) |
| Site Clearance & Preparation                                       | Tracked Excavator (C3.24)                           | 46                               | 39             | 40             | 31             |
|                                                                    | Articulated lorry (C11.10)                          | 49                               | 42             | 43             | 34             |
|                                                                    | Dump Truck (C4.2)                                   | 50                               | 43             | 44             | 35             |
|                                                                    | Surfacing (D8.25)                                   | 40                               | 33             | 34             | 25             |
|                                                                    | <b>Cumulative Site Clearance and Preparation</b>    | <b>54</b>                        | <b>47</b>      | <b>47</b>      | <b>39</b>      |
| Tower Foundations                                                  | Tracked Excavator (C3.24)                           | 46                               | 39             | 40             | 31             |
|                                                                    | Mobile Telescopic Crane (C4.39)                     | 49                               | 42             | 43             | 34             |
|                                                                    | Concrete Pump (C3.25)                               | 50                               | 43             | 44             | 35             |
|                                                                    | Poker Vibrator (C4.33)                              | 50                               | 43             | 44             | 35             |
|                                                                    | <b>Cumulative Tower Foundations</b>                 | <b>55</b>                        | <b>48</b>      | <b>49</b>      | <b>40</b>      |
| Sheet Piling<br>(to be confirmed)                                  | Vibratory Piling Rig (C3.8)                         | 59                               | 52             | 52             | 44             |
| Tower Assembly and Erection and Conductor / Insulator Installation | Articulated lorry (C11.10)                          | 49                               | 42             | 43             | 34             |
|                                                                    | Hand tools                                          | 53                               | 46             | 47             | 38             |
|                                                                    | Mobile Telescopic Crane (C4.39)                     | 49                               | 42             | 43             | 34             |
|                                                                    | <b>Cumulative Assembly and Installation</b>         | <b>56</b>                        | <b>49</b>      | <b>49</b>      | <b>41</b>      |
| Decommissioning and Reinstatement of Land                          | Tracked Excavator (C3.24)                           | 46                               | 39             | 40             | 31             |
|                                                                    | Dump Truck (C4.2)                                   | 50                               | 43             | 44             | 35             |
|                                                                    | Hand tools                                          | 53                               | 46             | 47             | 38             |
|                                                                    | Mobile Telescopic Crane (C4.39)                     | 49                               | 42             | 43             | 34             |
|                                                                    | <b>Cumulative Decommissioning and Reinstatement</b> | <b>56</b>                        | <b>50</b>      | <b>50</b>      | <b>41</b>      |

The indicative construction noise prediction values at all representative NSLs are within the criterion of 70 dB L<sub>Aeq,1hr</sub> for weekdays and the criterion of 65 dB L<sub>Aeq,1hr</sub> for Saturdays. Due to the large distances between identified areas of construction works, the associated noise levels at the nearest noise sensitive receivers are relatively low and, in many cases, less than or of the order of the prevailing ambient noise levels.

The effect on the noise environment due to construction activities will be transient in nature and good practice noise reduction measures will be implemented to minimise the effect of construction activities on the surroundings.

In terms of the additional construction traffic on local roads that will be generated as a result of this development, the following comment is presented. In order to increase traffic noise levels by 1 dB, traffic volumes would need to increase by approximately 25% along the local road network. In the

context of the existing traffic scenario, additional traffic introduced onto the local road network due to the construction phase of the proposed development will not result in sufficient changes in traffic volume to cause a significant noise effect.

## **10.4.2 OPERATIONAL PHASE**

### **10.4.2.1 Noise**

Typically, the operation of the overhead power line will not emit any noise that would be perceptible at nearby noise sensitive locations. Operational Phase noise that may occur from power lines can be characterised as buzzing, humming or crackling sounds which is associated with 'Corona Noise'. A research document published by EirGrid in May 2016 titled '*Literature review and evidence based filed study on the noise effects of high voltage transmission development*' found that Corona noise only becomes a significant issue at higher voltages i.e. 350 – 500 kV and above, and is not likely for 110kV and 220kV transmission lines.

Furthermore, the phenomenon is less likely with new components as the it can be associated with dirty, damaged, or cracked insulators. Any noise of this nature associated with the new power lines is considered to form part of the existing noise environment. It is not possible to predict Corona Noise from the operation of the line however, based on the evidence is considered that audible Corona Noise is unlikely to be associated with this development. In this instance, the Operational Phase will be of neutral noise effect.

In summary, once constructed and operational, it is anticipated that any noise generated by the grid line will not be audible at any noise sensitive location and the baseline noise environment is expected remain unchanged. The associated effects can therefore be described as neutral, imperceptible, and long term.

### **10.4.2.2 Vibration**

There is no source of vibration associated with the operation of the development that will give rise to effects at nearby sensitive locations. In terms of the operational phase of the development the associated effect is stated to be neutral, imperceptible, and long-term.

## **10.5 MITIGATION AND MONITORING MEASURES**

As the assessments in previous sections have concluded, no specific noise or vibration mitigation measures are required for activities associated with the proposed development. The following is presented for information purposes so that potential noise effects are minimised.

### **10.5.1 CONSTRUCTION PHASE**

With regard to construction activities, reference has been made to BS5228 Parts 1 and 2, which offer detailed guidance on the control of noise and vibration from demolition and construction activities. Various mitigation measures will be considered and applied during the construction of the proposed development. Full details are contained in the Outline Construction Environmental Management Plan (CEMP).

### **10.5.2 OPERATIONAL PHASE**

#### **10.5.2.1 Noise**

The noise effect assessment outlined previously has demonstrated that mitigation measures are not required.

### 10.5.2.2 Vibration

The vibration effect assessment outlined previously has demonstrated that mitigation measures are not required.

## 10.6 RESIDUAL EFFECTS

### 10.6.1 NOISE

#### 10.6.1.1 Construction Phase

The construction noise assessment has shown that predicted noise levels associated with construction activity are below the relevant noise criteria set out Section 10.3.1. Therefore, the effect at residential noise sensitive locations is expected to be negative, not significant and short-term.

The noise assessment of construction vehicle movements associated with the site has shown that the predicted effect will be a negative, imperceptible and short-term effect on off-site noise sensitive locations considering existing traffic volumes on the local road network.

#### 10.6.1.2 Operational Phase

There are no proposed sources of noise associated with the operation of the proposed development. The associated effects can therefore be described as neutral, imperceptible, and long term.

### 10.6.2 VIBRATION

#### 10.6.2.1 Construction Phase

Due to the nature of the proposed construction works and the large distance between vibration-generating activity and residential sensitive locations, the effect at these locations is expected to be neutral, imperceptible and short-term.

#### 10.6.2.2 Operational Phase

There are no proposed sources of vibration associated with the operation of the proposed development. The associated effects can therefore be described as neutral, imperceptible, and long term.

## 10.7 INTERACTIONS

In compiling this environmental impact assessment, reference has been made to the project description provided by the project co-ordinators, project drawings provided by the project architects and information relating to construction activities provided by the engineers. Noise emission sources from the proposed development during the construction and operational phases will be from construction plant and activity. The noise impact assessment has been prepared in consultation with the design team and engineers. Reference can be made to the relevant chapters for additional information.

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# 11 LANDSCAPE & VISUAL IMPACT

## 11.1 INTRODUCTION

This Chapter describes how the proposed development will affect the appearance and character of the area – both locally and the wider context. The assessment is supported by a series of images that illustrate how the project will appear 'before' and 'after' from a number of locations. Where adverse effects (if any) on the landscape are anticipated, then measures to avoid, reduce or remedy such effects are described. This chapter has been prepared on the basis of visits to the site and its surroundings, examination of relevant documentation such as the Development Plan of the County as well as Ordnance Survey Plans and maps at various scales. The report also draws on experience of addressing concerns expressed in relation to previous planning applications on these lands as well as evaluating the impacts of other large-scale industrial projects elsewhere in Ireland.

### 11.1.1 SCOPING & SCREENING

The 'Scope' of this section arises from consultations and experience as described in Chapter 2 *Screening & Scoping*. Prior experience together with the consultations identified that the following issues arise in relation to landscape and visual impacts.

Attention has been drawn to the fact that these concerns primarily arise from designations and notifications of sensitivity and significance that are contained in the following documents:

- Kildare County Development Plan (2017-2023),
- Leixlip Local Area Plan (2016-2022)
- Collinstown Local Area Plan 2010.

Concern has been expressed about the potential for the project to affect the following nearby properties of historical and cultural significance (reference codes below are taken from the relevant development plans):

#### Carton

- Carton Demesne – historic designed landscape
- Carton House – outbuildings & lodges (views & prospects from 1st floor and roof balcony)
- Carton Prospect Tower – axial relationship to house, Obelisk, Wonderful Barn & Castletown

#### *Relevant Kildare County Development Plan Policy:*

- EO 55: To recognise the sensitive and unique quality of Carton House as a tourism facility of national and international significance and to ensure that its integrity be protected. The Council will support and encourage further appropriate development of the tourism and recreational facilities at Carton House, having regard to its status as a house and demesne of international heritage importance.
- PS 6: Maintain the views to and from Carton House and within Carton Demesne.
- PSO 5: Preserve the views to and from Carton House within the Demesne walls, as outlined in Map 12.12

#### Ravensdale

- Ravensdale Demesne - visual impact on historic designed landscape
- Ravensdale House - outbuildings & lodges (visual impact on views & prospects from protected structure)

### Local Protected Structures

- Blakestown, Collinstown, Nelson's Cottage and Hedsor House
- Collinstown House IP62, BH1 (BH1: To ensure that new development in the vicinity of the Protected Structure at Collinstown House, is appropriate to the setting and character of that building.)
- Nelson's Cottage: IP 60 (Stone Cottage, Maynooth Road)

### Local Proposed Protected Structures

- Royal Canal Aquaduct
- Romanesque Bath (The 'Roman Baths')
- Hexagonal Well
- Toll House

### Impact on vista and axial views to:

- Obelisk (140ft high)
- Wonderful Barn (70ft)
- Castletown

### Impact on axial, vista and long-distance views from

- Castletown House and Demesne
- Carton House and Demesne

### Impacts on views from:

- Prospect Tower (within Carton Demesne)
- the Obelisk
- the Wonderful Barn

### Impact on views from bridges

- Back Bridge RW1
- Carton Bridge RW2
- Sandford's Bridge RW3
- Louisa Bridge RC3
- Deey Bridge RC4

### Impact on preserved views and prospects

- Of the Liffey from all locations
- Of the Royal Canal and Aqueduct
- Royal Canal Area of High Amenity
- Views to and from Canal and Rye Water

### Impact on long distance views

- Leixlip Castle (Long, distant visual impact on views & prospects from Protected Structure)
- Leixlip Spa & bridge promenade (Long distant visual impact on views & prospects from Protected Structure)

### Impact on local visual amenity

- Kellystown Lane and Kellystown townland, (the rural nature of)
- Residents to the rear on the northern side of the Rye Water
- Leixlip/ Maynooth Road and residents thereon

These issues are all addressed within this chapter as well as in Chapter 14 *Built Heritage*.

## 11.1.2 ASSESSMENT METHODOLOGY

The assessment follows the layout and content suggested by the EPA *Guidelines on Information to be Contained in EIARs* and also has regard to the IEMA/LI *Guidelines on Landscape and Visual Impact Assessment* (see below).

Description of the receiving environment (environs and site) having regard to:

- Context
- Character
- Significance (including designations)
- Sensitivity

Description of the proposed development including:

- Siting
- Design
- Site Works

Description of the likely significant impact including:

- Potential Impacts
- Residual Impacts

Description of Mitigation Measures including:

- Avoidance

#### **11.1.2.1 Full Scale Calibration**

In response to concerns about potential effects on views to, from and between heritage structures it was necessary to attempt to obtain access to structures that do not currently permit public access. These were visited by the impact assessors – accompanied by relevant officials – to enable observations to be made to assess the existence of inter-visibility and visibility.

#### **11.1.2.2 Other Forms of Assessment Employed**

In response to concerns about potential effects on views to, from and between heritage structures it was necessary to attempt to obtain access to structures that do not currently permit public access. These were visited by the impact assessors – accompanied by relevant officials – to enable observations to be made to assess the existence of inter-visibility and visibility.

#### **11.1.2.3 Other Forms of Assessment Considered**

Other forms of assessment are available and were considered before being deemed inappropriate for the circumstances of this project.

Scale models have little predictive capacity for establishing landscape and visual effects due to the generalised nature of the representation and the inability to accurately model local effects of micro-topography, walls and vegetation which are critical determinants of visual impacts in rural settings.

'ZVI' Analysis – an assessment of the 'Zone of Visual Influence' of a project is a computer-based simulation of the theoretical extent of an area of topography that will be illuminated from a simulated point of light at the highest point of a structure. It is most effective when used to assess the theoretical maximum extent of visibility of tall single objects in large-scale open landscapes. It takes no account of the effects of vegetation. It was not deemed appropriate to use in this instance on account of the significance of the effects of mature vegetation and the screening role of tall walls and hedgerows which cannot be modelled.

#### 11.1.2.4 Worst Case Assessment

In accordance with EIA methodology<sup>42</sup> best practice is to identify and describe 'worst case' impacts, as well as providing representative views within the area likely to be affected – including indications of nearby areas from which the proposed development will not be visible. In the case of Landscape and Visual Impact Assessment this involves the following;

- Views from gates and entrances offering the most unscreened views of the development site
- Views at locations where roadside hedges have gaps or gates offering unscreened views of the development site
- Views from Protected Structures and their context/setting
- Views in winter foliage of areas where trees offer screening.
- Views that were examined in the previous EISs (2012 - 2020)

Views were selected on the basis of the scoping described above, experience from previous planning applications, site visits and the consideration of 'worst case' described above.

These view locations have been selected in an attempt to satisfy the following criteria:

- To provide continuity with the relevant Viewing Points used in previous EISs (previously permitted development 2012 - 2020)
- To obtain views from locations where the development would be visible from the public realm
- To illustrate 'worst case' views
- To examine views identified as being of concern by Kildare County Council in scoping
- Concentrations of potential viewers
- Locations of amenity significance
- Locations of heritage significance

On the basis of these considerations, views were examined and modelled from 18 locations. The locations are shown on the following page while the following table (Table 11.1) provides a description of each location together with the reason for the selection of each.

A detailed description and photograph is given in Section 11.3 of the significance and sensitivity of each of the existing views ('baseline') and a description and photomontage of the effect on each view is given in Section 11.4.

## 11.2 THE PROPOSED DEVELOPMENT

There are descriptions of the proposed building development contained in Chapter 4 *Project Description* of this EIA as well as more detailed descriptions of the Planning Application Report that accompanies this application. The critical elements with a capacity to affect the appearance and character of the landscape are as follows:

The installation of 7 new double circuit steel lattice towers. The towers will range in height from approximately 20.75 m to approximately 39.75 m above ground level and will support six electrical conductors and associated overhead line infrastructure.

The decommissioning and removal of 4 existing double circuit steel lattice towers and associated electrical conductors to include the removal of the existing towers and associated electrical conductors from site.

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Figure 11.1 View Location Map<sup>31</sup>

<sup>31</sup> Views 1 – 5 (red) used in previous EIAR, Views A1 – A8 (yellow) for this project only

**Table 11.1 View Locations and Reason for Selection<sup>32</sup>**

| View | Location                                                                                      | Reason for Selection                                                                                                                                                                                                                                                                                                                                                                     | Notes                                                                                                                                                                                                                                                                                                                                                                                                                |
|------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | View looking north-east.<br>On R449 Bridge Crossing Railway and Royal Canal & Royal Canal Way | This is one of the highest locations on a public road in the vicinity. It offers expansive views in all directions. Due to its relative proximity to the proposed development it is regarded as a 'worst case' view.                                                                                                                                                                     | Views from elevated locations are scarce in the very flat landscapes of north Kildare.                                                                                                                                                                                                                                                                                                                               |
| 2    | View on Louisa Bridge looking north<br>On R148                                                | This is a locally elevated viewing point from a busy road that makes one of the main entrances to Leixlip. Due to its immediate proximity to the proposed development and high footfall it is regarded as a 'worst case' view.                                                                                                                                                           | The Bridge is a Proposed Protected Structure – which also requires the protection of its setting and context. The Views from this location are designated as one of the 'Views and Prospects to be Preserved Views and Prospects to be Preserved(Related to Canal Corridor)' by the Kildare County Development Plan and by the Leixlip Local Area Plan. Note that the designated View is oriented towards the Canal. |
| 3    | View looking west from the path along the Royal Canal Way beside an information board.        | This is a locally elevated viewing point that is of significance for a number of reasons. The Viewing Point lies along The Royal Canal Way and is adjacent to information board that describes the 'Roman Baths' and public amenity area that lies immediately north. Due to it's relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view | The Royal Canal Way is a National Waymarked Trail.<br>This location also lies along the edge of an area zones 'F2' Strategic Open Space                                                                                                                                                                                                                                                                              |
| 4    | View looking west from the path along the Royal Canal Way beside an information board.        | This is a locally elevated viewing point that is of significance for a number of reasons. The Viewing Point lies along The Royal Canal Way and is adjacent to information board that describes the public amenity area that lies immediately north. Due to it's relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view                   | The Royal Canal Way is a National Waymarked Trail.<br>This location also lies along the edge of an area zones 'F2' Strategic Open Space                                                                                                                                                                                                                                                                              |

<sup>32</sup> Note that the View referencing system uses two prefixes single digits ("2") are Reference View that are used on every Intel planning application. A selection of these are included with this application to ensure consistency and continuity. A second set of prefixes contain a number and a letter ["A3"] these are additional views that have been prepared specifically for this application.

|    |                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                |
|----|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5  | View looking west from the path along the Royal Canal Way beside The Toll House                          | This is a locally elevated viewing point that is of significance for a number of reasons. The Viewing Point lies along The Royal Canal Way and is adjacent to information board and sign posts that describes the Toll House and the nearby Leixlip Waterfall. Due to its relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view            | Note that the Rye Water Aquaduct and the Collectors House [The Toll House] are Proposed Protected Structure.<br>This location also lies within an area zones 'F2' Strategic Open Space                         |
| A1 | View looking north from a public open space within The Woods, Easton – a residential area.               | This view illustrates the appearance and character of public areas in the nearest public residential area to the west of the proposed development                                                                                                                                                                                                                                           |                                                                                                                                                                                                                |
| A2 | View looking north from a public open space Glen Easton View – a residential                             | This view illustrates the appearance and character of public areas in the nearest public residential area to the west of the proposed development                                                                                                                                                                                                                                           |                                                                                                                                                                                                                |
| A3 | View looking north-west from a public car park at Oaklawn – just west of Accommodation Road.             | This view illustrates the appearance and character of public areas in the nearest public area to the south east of the proposed development. Due to its relative proximity to the proposed development it is regarded as a 'worst case' view                                                                                                                                                |                                                                                                                                                                                                                |
| A4 | View looking west from an elevated public walkway leading to the Leixlip [Loiisa Bridge] Railway Station | This is a locally elevated viewing point. It illustrates the appearance and character of public areas in the nearest public area with a high footfall to the south east of the proposed development. Due to its relative proximity to the proposed development it is regarded as a 'worst case' view                                                                                        |                                                                                                                                                                                                                |
| A5 | View looking west from within the public access to the the Leixlip [Loiisa Bridge] Railway Station.      | This illustrates the appearance and character of public areas in a nearby public area with a high footfall to the south east of the proposed development.<br>This location also lies close to Louisa Park Apartments that have principal windows directed towards this view from 3 and 4 story high buildings.                                                                              | Note that Station House is a Proposed Protected Structure.                                                                                                                                                     |
| A6 | View looking west from the vicinity of the Roman Bath and the Louisa Spa public Amenity Area             | This illustrates the appearance and character of public areas in a nearby public amenity area with a high footfall in the immediate vicinity of a Proposed Protected Structure. Due to its immediate proximity to the proposed development, together with a number of Proposed Protected Structures, Public Amenities as well as and high footfall this is regarded as a 'worst case' view. | Note that the adjoining Romanesque, Baths as well the nearby Hexagonal Well and Rye Water Aqueduct are Proposed Protected Structure.<br>This location also lies within an area zones 'F2' Strategic Open Space |
| A7 | View looking south west from a public path within an amenity                                             | This illustrates the appearance and character of public areas in a nearby public amenity area with a high footfall. Due to its relative proximity to the proposed development, together with a number of Proposed                                                                                                                                                                           | Note that the Rye Water Aqueduct and the Collectors House [The Toll                                                                                                                                            |

|    |                                                                            |                                                                                                                                                                                                 |                                                                                                               |
|----|----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
|    | area leading towards the Leixlip Waterfall.                                | Protected Structures, Public Amenities as well as and high footfall this is regarded as a 'worst case' view.                                                                                    | House] are Proposed Protected Structure.<br>This location also within an area zones 'F2' Strategic Open Space |
| A8 | View looking west from public open space in River Forest, Newtown, Confey. | This is a locally elevated viewing point, the view illustrates the appearance and character of public areas in the nearest public residential area 1 km to the east of the proposed development |                                                                                                               |

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## 11.3 THE RECEIVING ENVIRONMENT

This section provides a description of the existing appearance and character of the area which establishes a reference - or 'baseline' against which to assess the likely effects of the project.

### 11.3.1 CHARACTER

The site lies in the Rye Water Valley within the Plain of Kildare on the western outskirts of the ancient settlement of Leixlip. This part of Kildare is a zone of transition between the built-up areas of Dublin's outer edges and the open countryside that characterises most of Kildare.

There are two relevant factors in the context. The first is that the Intel lands lie between the settlements of Maynooth and Leixlip – both of these have experienced significant growth in recent years – as described in Chapter 5 *Population & Human Health*. The second is that this area contains a concentration of 18<sup>th</sup> century demesne landscapes – of the nationally notably Carton House and Castletown House – as well as other smaller ones such as Ravensdale House and Sion House – as described in Chapter 14 of this EIAR (*Built Heritage*).

Figure 11.2 below shows the Intel campus in the context of the settlements of Maynooth and Leixlip as well as major historic landscapes – such as Carton and Castletown and other smaller or more distant historic landscapes such as Ravensdale (A), Sion (B) and Leixlip Castle (C).



Figure 11.2 Intel campus in Context<sup>33</sup>

### 11.3.2 CHARACTER

The Kildare County Development Plan 2017 - 2023 classifies this as part of the 'Northern Lowlands' of the County which are described as *areas with the capacity to generally accommodate a wide range of uses without significant adverse effects on the appearance or character of the area*. The proposed development is also situated within a Class 1 Landscape Character Area of low sensitivity

Technically the site is also part of a river corridor (the Rye Water) as well as part of a Canal Corridor (the Royal canal) which is recognised by the County Development Plan as a 'landscape within a landscape'. River corridors are described as representing particularly important Character Areas for an inland county such as Kildare. A number of canals and rivers meander through the County and define the landscape around them.

<sup>33</sup> Source: Bing Maps (<http://www.bing.com/maps>)

Canal corridors are characterised by generally open views to surrounding pasture and agricultural lands. The canal banks are generally wooded (also with reed and natural vegetation), although large sections move directly into open pasturelands. Canal corridors and banks can generally be classified vulnerable to sensitive.



Figure 11.3 Landscape Character Areas<sup>43</sup>

### 11.3.3 SENSITIVITY

Landscape Sensitivity is defined<sup>44</sup> as the extent to which a landscape can accommodate change without unacceptable loss of existing character or interference with values.

#### 11.3.3.1 General Sensitivities

Within the Kildare County Development Plan, Northern Lowland landscapes are generally classified as robust to normal, however sensitive areas or landscape factors can be found at specific locations. River and canal corridors and banks are generally classified vulnerable or sensitive. Views from nearby demesne landscapes are another sensitivity.

#### 11.3.3.2 Local Sensitivities

The Royal Canal Way – a National Way-marked Trail, is a significant local sensitivity.

The Leixlip Spa and the Leixlip Waterfall are popular and well-used local amenities. The R148 (the former Dublin to Galway road) is a busy road where any adverse effects might be expected to affect a significant number of viewers.

The elevated route of the canal and railway, west of Leixlip, is frequented by many people, either as walkers or as train passengers. The link from the M4 affords elevated views toward the site from places where it is raised as it crosses the canal and railway.

The Rye Water Valley as viewed from its eastern and western ends (the viaduct and Sandford's Bridge respectively), are local amenities. The eastern and western ends of the valley are designated as "Amenity /Open Space" areas in the Development Plan.

### 11.3.3.3 Local Resilience

Resilience' is a term used in landscape studies to define the ability of a landscape to accommodate change – it is the opposite of 'sensitivity'. For some types of landscape classification, the term 'Visual Absorption Capacity' (VCA) is used when identifying areas where enclosing topography or vegetation – or both – imbue an area with the capacity to accommodate development with few effects on the surrounding larger landscape.

Relative to the surrounding plains of Kildare, the Rye Water Valley – between the eastern boundaries of Carton and the viaduct at Louisa Bridge has a high level of visual resilience. This means that developments within it are unlikely to be significantly visible from locations in the wider landscape of east Kildare. A 'box-like' landscape enclosure is formed by the steep-sided valley of the Rye Water and the very high Viaduct north of Louisa Bridge. The perimeter elevation of Confey Road to the north is around 70 m OD along much of its length while the R148 and the Viaduct have an elevation around 55 m OD. The surroundings contain many mature trees that are around 25 m in height which means that the Intel site is 'enclosed' to heights of around 80 – 95 m OD. This means that the visibility of the Intel site has remained very localised over its many years of development.

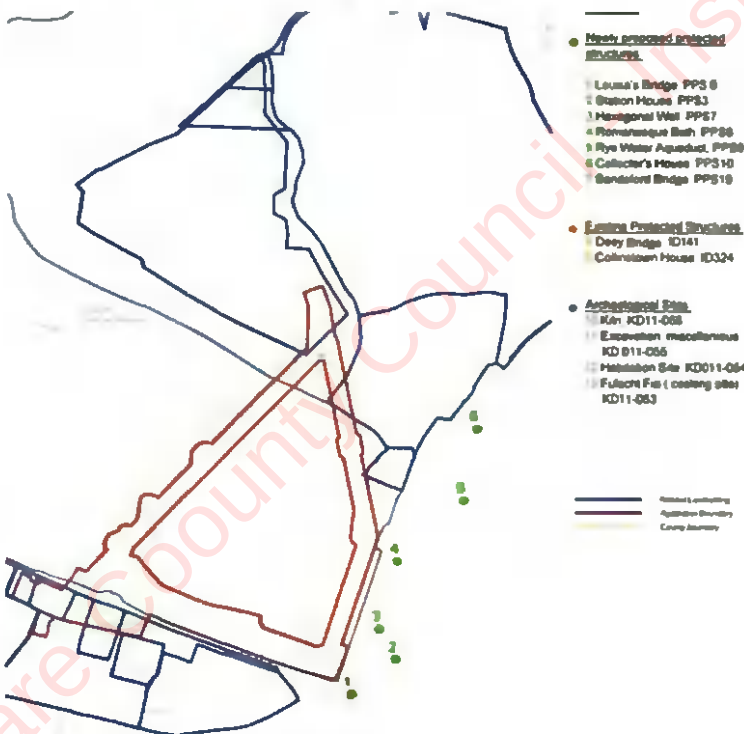
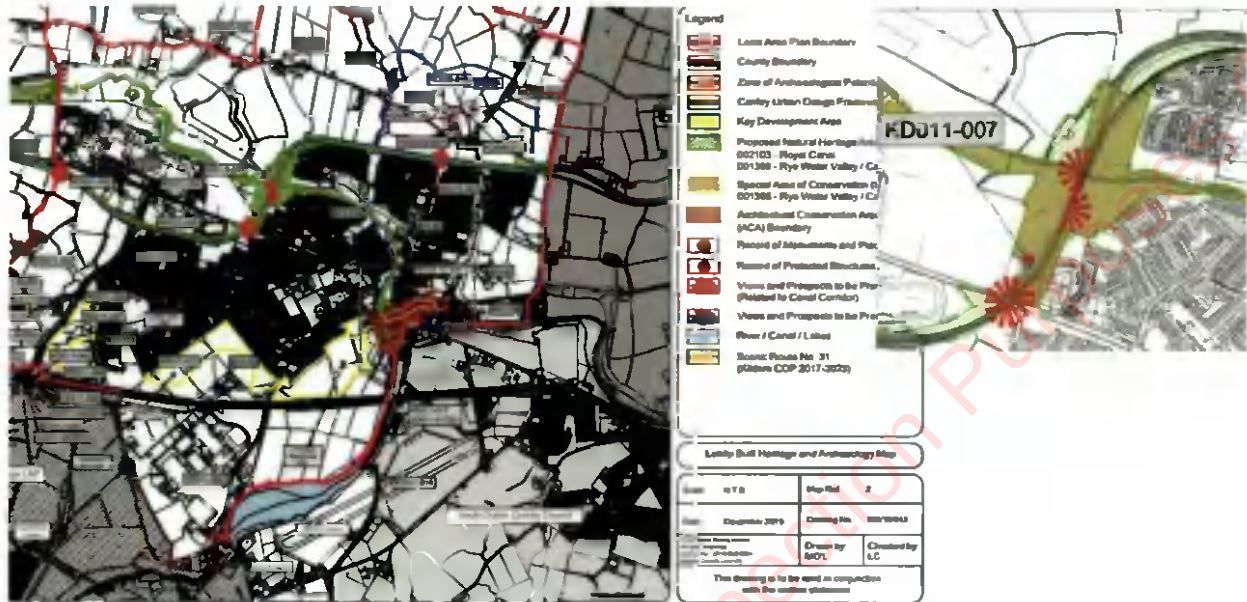
Similarly, there is a local landscape enclosure formed between the Royal Canal Viaduct and the tall earth 'berms' and landscape planting along the eastern end of the intel holding.



**Figure 11.4 Local Landscape Enclosure between Viaduct and Berms**

### 11.3.4 SIGNIFICANCE

The significance of the landscape in official documents is described in detail within the 'Scoping' Section at 11.1.1 above. Views from Louisa Bridge are included in the schedule of Views and Vistas of the Development Plan – while the potential for effects on historic/Protected Structures and their environs are also noted as being of significance.



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Figure 11.5 Proposed route in context of relevant designations

### 11.3.5 EXISTING VIEWS

The following pages provide a description of the existing views from 18 selected locations. Each view is described in terms of three considerations

1. The reason for the selection of the view
2. The significance of the View (is it affecting a Protected Structure or view?)
3. The sensitivity of the View (i.e. what would be most likely to adversely affect the view)

It should be noted that the numbering of the views which follow correspond to the numbering used in Appendix 11.2 which provides full page reproductions of each image shown in this section of the EIA.

|                                     |                                                                                                                                   |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 1</b></p>                |                                                |
| <p><b>Reasons for Selection</b></p> | <p>This is one of the highest locations on a public road in the vicinity. Existing Towers are visible at centre and on right.</p> |
| <p><b>Significance</b></p>          | <p>It offers expansive views in all directions.</p>                                                                               |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development it is regarded as a 'worst case' view.</p>                           |

**Figure 11.6 Existing View 1**

|                                     |                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 2a</b></p>               |                                                                                                                                                                                                                                                   |
| <p><b>Reasons for Selection</b></p> | <p>This is a locally elevated viewing point from a busy road that marks one of the main entrances to Leixlip.</p>                                                                                                                                                                                                                    |
| <p><b>Significance</b></p>          | <p>Protected Structure – which also requires the protection of its setting and context. The Views from this location are designated as one of the 'Views and Prospects to be Preserved Views and Prospects to be Preserved(Related to Canal Corridor)' by the Kildare County Development Plan and by the Leixlip Local Area Plan</p> |
| <p><b>Sensitivity</b></p>           | <p>Due to its immediate proximity to the proposed development and high footfall it is regarded as a 'worst case' view.</p>                                                                                                                                                                                                           |

Figure 11.7 Existing View 2a

|                              |                                                                                                                                                                                                                                                                                            |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View 2b                      |                                                                                                                                                                                                         |
| <b>Reasons for Selection</b> | This is a locally elevated viewing point from a busy road that marks one of the main entrances to Leixlip. Existing towers are visible on right.                                                                                                                                           |
| <b>Significance</b>          | Protected Structure – which also requires the protection of its setting and context. The Views from this location are designated as one of the ‘Views and Prospects to be Preserved (Related to Canal Corridor)’ by the Kildare County Development Plan and by the Leixlip Local Area Plan |
| <b>Sensitivity</b>           | Due to its immediate proximity to the proposed development and high footfall it is regarded as a ‘worst case’ view.                                                                                                                                                                        |

Figure 11.8 Existing View 2b

|                                     |                                                                                                                                                 |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 3a</b></p>               |                                                              |
| <p><b>Reasons for Selection</b></p> | <p>The Viewing Point lies along The Royal Canal Way</p>                                                                                         |
| <p><b>Significance</b></p>          | <p>The Royal Canal Way is a National Waymarked Trail.<br/>This location also lies along the edge of an area zones 'F2' Strategic Open Space</p> |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view</p>                        |

Figure 11.9 Existing View 3a

|                              |                                                                                                                                                                                                                                                                       |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View 3c                      |                                                                                                                                                                                    |
| <b>Reasons for Selection</b> | This is a locally elevated viewing point that is of significance for a number of reasons. The Viewing Point lies along The Royal Canal Way and is adjacent to information board that describes the 'Roman Baths' and public amenity area that lies immediately north. |
| <b>Significance</b>          | The Royal Canal Way is a National Waymarked Trail.<br>This location also lies along the edge of an area zones 'F2' Strategic Open Space                                                                                                                               |
| <b>Sensitivity</b>           | Due to its relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view                                                                                                                                                     |

Figure 11.10 Existing View 3c

|                                     |                                                                                                                                                                                                                                                            |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 4a</b></p>               |                                                                                                                                                                         |
| <p><b>Reasons for Selection</b></p> | <p>This is a locally elevated viewing point that is of significance for a number of reasons. The Viewing Point lies along The Royal Canal Way and is adjacent to information board that describes the public amenity area that lies immediately north.</p> |
| <p><b>Significance</b></p>          | <p>The Royal Canal Way is a National Waymarked Trail.<br/>This location also lies along the edge of an area zones 'F2' Strategic Open Space</p>                                                                                                            |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view</p>                                                                                                                                   |

**Figure 11.11 Existing View 4a**

|                                     |                                                                                                                                                                                                                                                                                                   |
|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 4b</b></p>               |                                                                                                                                                                                                                |
| <p><b>Reasons for Selection</b></p> | <p>This is a locally elevated viewing point that is of significance for a number of reasons. The Viewing Point lies along The Royal Canal Way and is adjacent to information board that describes the public amenity area that lies immediately north. Existing tower is visible near centre.</p> |
| <p><b>Significance</b></p>          | <p>The Royal Canal Way is a National Waymarked Trail.<br/>This location also lies along the edge of an area zones 'F2' Strategic Open Space</p>                                                                                                                                                   |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view</p>                                                                                                                                                                          |

Figure 11.12 Existing View 4b

|                                     |                                                                                                                                                                                                                                                            |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 4c</b></p>               |                                                                                                                                                                         |
| <p><b>Reasons for Selection</b></p> | <p>This is a locally elevated viewing point that is of significance for a number of reasons. The Viewing Point lies along The Royal Canal Way and is adjacent to information board that describes the public amenity area that lies immediately north.</p> |
| <p><b>Significance</b></p>          | <p>The Royal Canal Way is a National Waymarked Trail.<br/>This location also lies along the edge of an area zones 'F2' Strategic Open Space</p>                                                                                                            |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view</p>                                                                                                                                   |

Figure 11.13 Existing View 4c

|                                     |                                                                                                                                                                                                                                                                       |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 5a</b></p>               |                                                                                                                                                                                    |
| <p><b>Reasons for Selection</b></p> | <p>This is a locally elevated viewing point that is of significance for a number of reasons. The Viewing Point lies along The Royal Canal Way and is adjacent to information board and sign posts that describes the Toll House and the nearby Leixlip Waterfall.</p> |
| <p><b>Significance</b></p>          | <p>Note that the Rye Water Aquaduct and the Collectors House [The Toll House] are Proposed Protected Structure. This location also lies within an area zones 'F2' Strategic Open Space</p>                                                                            |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view</p>                                                                                                                                              |

**Figure 11.14 Existing View 5a**

|                                     |                                                                                                                                                                                                                                                                        |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 5b</b></p>               |                                                                                                                                                                                     |
| <p><b>Reasons for Selection</b></p> | <p>This is a locally elevated viewing point that is of significance for a number of reasons. The Viewing Point lies along The Royal Canal Way and is adjacent to information board and sign posts that describes the Toll House and the nearby Leixlip Waterfall .</p> |
| <p><b>Significance</b></p>          | <p>Note that the Rye Water Aquaduct and the Collectors House [The Toll House] are Proposed Protected Structure. This location also lies within an area zones 'F2' Strategic Open Space</p>                                                                             |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view</p>                                                                                                                                               |

**Figure 11.15 Existing View 5b**

|                                     |                                                                                                                                                                                                                                                                        |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 5c</b></p>               |                                                                                                                                                                                     |
| <p><b>Reasons for Selection</b></p> | <p>This is a locally elevated viewing point that is of significance for a number of reasons. The Viewing Point lies along The Royal Canal Way and is adjacent to information board and sign posts that describes the Toll House and the nearby Leixlip Waterfall .</p> |
| <p><b>Significance</b></p>          | <p>Note that the Rye Water Aquaduct and the Collectors House [The Toll House] are Proposed Protected Structure. This location also lies within an area zones 'F2' Strategic Open Space</p>                                                                             |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development and high footfall it is regarded as a 'worst case' view</p>                                                                                                                                               |

Figure 11.16 Existing View 5c

|                              |                                                                                                                                                                                                                                                                |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View A1                      |                                                                                                                                                                             |
| <b>Reasons for Selection</b> | This view illustrates the appearance and character of public areas in the nearest public residential area to the west of the proposed development. It is representative of views over a wide residential area. Existing tower is discernible to left of centre |
| <b>Significance</b>          | Locally significant public amenity area                                                                                                                                                                                                                        |
| <b>Sensitivity</b>           | Concern about potential loss of visual amenity                                                                                                                                                                                                                 |

**Figure 11.17 Existing View A1.**

|                              |                                                                                                                                                                                                                |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View A2a                     |                                                                                                                             |
| <b>Reasons for Selection</b> | This view illustrates the appearance and character of public areas in the nearest public residential area to the west of the proposed development. It is representative of views over a wide residential area. |
| <b>Significance</b>          | Locally significant public amenity area                                                                                                                                                                        |
| <b>Sensitivity</b>           | Concern about potential loss of visual amenity                                                                                                                                                                 |

**Figure 11.18 Existing View A2a**

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|                                     |                                                                                                                                                                                                                       |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A2b</b></p>              |                                                                                                                                    |
| <p><b>Reasons for Selection</b></p> | <p>This view illustrates the appearance and character of public areas in the nearest public residential area to the west of the proposed development. It is representative of views over a wide residential area.</p> |
| <p><b>Significance</b></p>          | <p>Locally significant public amenity area</p>                                                                                                                                                                        |
| <p><b>Sensitivity</b></p>           | <p>Concern about potential loss of visual amenity</p>                                                                                                                                                                 |

**Figure 11.19 Existing View A2b**

|                                     |                                                                                                                                                     |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A3a</b></p>              |                                                                  |
| <p><b>Reasons for Selection</b></p> | <p>This view illustrates the appearance and character of public areas in the nearest public area to the south east of the proposed development.</p> |
| <p><b>Significance</b></p>          | <p>Locally significant public amenity area</p>                                                                                                      |
| <p><b>Sensitivity</b></p>           | <p>Due to it's relative proximity to the proposed development it is regarded as a 'worst case' view</p>                                             |

Figure 11.20 Existing View A3a

|                              |                                                                                                                                                                                                                                                                                             |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>View A3b</b>              |                                                                                                                                                                                                          |
| <b>Reasons for Selection</b> | This view illustrates the appearance and character of public areas in the nearest public area to the south east of the proposed development.<br>Locally significant public amenity area<br>Due to it's relative proximity to the proposed development it is regarded as a 'worst case' view |
| <b>Significance</b>          |                                                                                                                                                                                                                                                                                             |
| <b>Sensitivity</b>           |                                                                                                                                                                                                                                                                                             |

**Figure 11.21 Existing View A3b**

|                                     |                                                                                                                                                                                                             |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A4a</b></p>              |                                                                                                                          |
| <p><b>Reasons for Selection</b></p> | <p>This is a locally elevated viewing point. It illustrates the appearance and character of public areas in the nearest public area with a high footfall to the south east of the proposed development.</p> |
| <p><b>Significance</b></p>          | <p>Due to its relative proximity to the proposed development it is regarded as a 'worst case' view.</p>                                                                                                     |
| <p><b>Sensitivity</b></p>           | <p>This location lies within an area zones 'K2' Strategic Open Space</p>                                                                                                                                    |

**Figure 11.22 Existing View A4a**

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|                                     |                                                                                                                                                                                                                                                  |
|-------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A4b</b></p>              |                                                                                                                                                               |
| <p><b>Reasons for Selection</b></p> | <p>This is a locally elevated viewing point. It illustrates the appearance and character of public areas in the nearest public area with a high footfall to the south east of the proposed development. Existing towers are visible on right</p> |
| <p><b>Significance</b></p>          | <p>Due to its relative proximity to the proposed development it is regarded as a 'worst case' view. This location lies within an area zones 'F2' Strategic Open Space</p>                                                                        |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development it is regarded as a 'worst case' view</p>                                                                                                                                           |

**Figure 11.23 Existing View A4b**

|                                     |                                                                                                                                                                  |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A5a</b></p>              |                                                                               |
| <p><b>Reasons for Selection</b></p> | <p>This illustrates the appearance and character of public areas in a nearby public area with a high footfall to the south east of the proposed development.</p> |
| <p><b>Significance</b></p>          | <p>This location also lies close to Louisa Park Apartments that have principal windows directed towards this view from 3 and 4 story high buildings.</p>         |
| <p><b>Sensitivity</b></p>           | <p>Station House is a Proposed Protected Structure.</p>                                                                                                          |

**Figure 11.24 Existing View A5a**

|                              |                                                                                                                                                           |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>View A5b</b>              |                                                                        |
| <b>Reasons for Selection</b> | This illustrates the appearance and character of public areas in a nearby public area with a high footfall to the south east of the proposed development. |
| <b>Significance</b>          | This location also lies close to Louisa Park Apartments that have principal windows directed towards this view from 3 and 4 story high buildings.         |
| <b>Sensitivity</b>           | Station House is a Proposed Protected Structure.                                                                                                          |

**Figure 11.25 Existing View A5b**

|                                     |                                                                                                                                                                                                                        |
|-------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A6a</b></p>              |                                                                                                                                     |
| <p><b>Reasons for Selection</b></p> | <p>This illustrates the appearance and character of public areas in a nearby public amenity area with a high footfall in the immediate vicinity of a Proposed Protected Structure.</p>                                 |
| <p><b>Significance</b></p>          | <p>Note that the adjoining Romanesque, Baths as well the nearby Hexagonal Well and Rye Water Aquaduct are Proposed Protected Structure.<br/>This location also lies within an area zones 'F2' Strategic Open Space</p> |
| <p><b>Sensitivity</b></p>           | <p>Due to it's immediate proximity to the proposed development, together with a number of Proposed Protected Structures, Public Amenities as well as and high footfall this is regarded as a 'worst case' view.</p>    |

Figure 11.26 Existing View A6a

|                                     |                                                                                                                                                                                                                                                 |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A6b</b></p>              |                                                                                                                                                              |
| <p><b>Reasons for Selection</b></p> | <p>This illustrates the appearance and character of public areas in a nearby public amenity area with a high footfall in the immediate vicinity of a Proposed Protected Structure. The existing transmission tower is visible on the right.</p> |
| <p><b>Significance</b></p>          | <p>Note that the adjoining Romanesque, Baths as well the nearby Hexagonal Well and Rye Water Aquaduct are Proposed Protected Structure.<br/>This location also lies within an area zones 'F2' Strategic Open Space</p>                          |
| <p><b>Sensitivity</b></p>           | <p>Due to it's immediate proximity to the proposed development, together with a number of Proposed Protected Structures, Public Amenities as well as and high footfall this is regarded as a 'worst case' view.</p>                             |

**Figure 11.27 Existing View A6b**

|                                     |                                                                                                                                                                                                                   |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A7a</b></p>              |                                                                                                                                |
| <p><b>Reasons for Selection</b></p> | <p>This illustrates the appearance and character of public areas in a nearby public amenity area with a high footfall.</p>                                                                                        |
| <p><b>Significance</b></p>          | <p>Note that the Rye Water Aquaduct and the Collectors House [The Toll House] are Proposed Protected Structure. This location also within an area zones 'F2' Strategic Open Space</p>                             |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development, together with a number of Proposed Protected Structures, Public Amenities as well as and high footfall this is regarded as a 'worst case' view.</p> |

**Figure 11.28 Existing View A7a**

|                                     |                                                                                                                                                                                                                   |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A7b</b></p>              |                                                                                                                                |
| <p><b>Reasons for Selection</b></p> | <p>This illustrates the appearance and character of public areas in a nearby public amenity area with a high footfall.</p>                                                                                        |
| <p><b>Significance</b></p>          | <p>Note that the Rye Water Aquaduct and the Collectors House [The Toll House] are Proposed Protected Structure. This location also within an area zones 'F2' Strategic Open Space</p>                             |
| <p><b>Sensitivity</b></p>           | <p>Due to its relative proximity to the proposed development, together with a number of Proposed Protected Structures, Public Amenities as well as and high footfall this is regarded as a 'worst case' view.</p> |

**Figure 11.29 Existing View A7b**

|                                                                                              |                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A7c</b></p> <p>Kildare County Council<br/>Planning Department<br/>28 NOV 2022</p> |                                                                                                                                |
| <p><b>Reasons for Selection</b></p>                                                          | <p>This illustrates the appearance and character of public areas in a nearby public amenity area with a high footfall.</p>                                                                                        |
| <p><b>Significance</b></p>                                                                   | <p>Note that the Rye Water Aquaduct and the Collectors House [The Toll House] are Proposed Protected Structure. This location also within an area zones 'F2' Strategic Open Space</p>                             |
| <p><b>Sensitivity</b></p>                                                                    | <p>Due to its relative proximity to the proposed development, together with a number of Proposed Protected Structures, Public Amenities as well as and high footfall this is regarded as a 'worst case' view.</p> |

Figure 11.30 Existing View A7c

|                              |                                                                                                                                                                                                                                                               |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>View A8</b>               |                                                                                                                                                                            |
| <b>Reasons for Selection</b> | This is a locally elevated viewing point, this view illustrates the appearance and character of public areas in the nearest public residential area 1 km to the east of the proposed development. It is representative of views over a wide residential area. |
| <b>Significance</b>          | Locally significant public amenity area                                                                                                                                                                                                                       |
| <b>Sensitivity</b>           | Concern about potential loss of visual amenity                                                                                                                                                                                                                |

**Figure 11.31 Existing View A8**

## 11.4 PREDICTED IMPACTS

There is no single definitive visual impact of a project. Instead there are a series of effects - each different in appearance and degree - that occur throughout the area from which the project is visible. This section describes the visual impact from a number of locations some of which are immediately adjacent (eg View A6) and some of which are at greater distance.

This section provides a commentary to accompany the 'before and after' photographic images. In each instance, a commentary is provided on how the 'Proposed' image illustrates the visual impact of the proposed development from the selected location. Each section concludes with a description of the visual impact from that location. (Note that larger versions of each photographic image are contained in Appendix 11.2 – these views also contain 'redline' versions of the photomontages to make it easier to distinguish the proposed development.)

Note that the images included in this section are smaller views than are recommended – the A4 sized views when viewed at arm's length, better illustrate how the project will appear in reality. When non-standard views are used (i.e. 'wide angle views') this is noted as being a 'composite' view. Composite views used in this report are accompanied by the full size views in Appendix 11.2.

Photomontages describe the effect of the proposed development by inserting the image of the new work into photographs of the existing view. If the new work is obscured by existing vegetation or topography then a 'redline' is shown to indicate where it is – so that viewers can satisfy themselves that it is obscured.

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|                    |                                                                                                                                                                          |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>View 1</b>      |                                                                                       |
| <b>Description</b> | One of the new towers is distantly visible to the right of the existing tower right of the centre of the View.                                                           |
| <b>Effect</b>      | There will be a <b>slight, neutral</b> visual impact seen in the context of this existing highly developed environment on account of the distance and developed context. |
| <b>Notes</b>       |                                                                                                                                                                          |

**Figure 11.32 Proposed View 1**

View 02a



|                    |                                                                                                                                                                                                                                                                                                                                                    |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Description</b> | An angle mast and conductors are prominently visible from this location. The height and distance create a locally dominant feature                                                                                                                                                                                                                 |
| <b>Effect</b>      | This is a <b>very significant, adverse effect</b> on the appearance and character of this location on account of the magnitude of the effect and the sensitivity of the receiving environment as part of a designated scenic view and recreational amenity area.                                                                                   |
| <b>Notes</b>       | Notwithstanding the designation of the view, the recognised recreational status of the area and the fact that the bridge structure is a proposed protected structure, the local environs here are also a highly developed area with extensive, existing artificial structures that are visually conspicuous in the foreground and middle distance. |

Figure 11.33 Proposed View 02a

|                    |                                                                                                                                                                                                                                                                                                                   |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View 02b           |                                                                                                                                                                                                                                |
| <b>Description</b> | An angle mast and conductors are prominently visible from this location. The height and distance create a locally dominant feature. Visible towers on the right are existing.                                                                                                                                     |
| <b>Effect</b>      | This is a <b>very significant, adverse effect</b> on the appearance and character of this location on account of the magnitude of the effect and the sensitivity of the receiving environment as part of a designated scenic view and recreational amenity area.                                                  |
| <b>Notes</b>       | Notwithstanding the designation of the view, the recognised recreational status of the area and the fact that the bridge structure is a proposed protected structure, the local environs here are also developed areas with some, existing artificial structures that are visually conspicuous in the foreground. |

Figure 11.34 Proposed View 02b

|                                                                                              |                                                                                                                    |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <p><b>View 03a</b></p> <p>Kildare County Council<br/>Planning Department<br/>28 NOV 2022</p> |                                 |
| <p><b>Description</b></p>                                                                    | <p>There is no visibility from this location when looking southward because of existing intervening vegetation</p> |
| <p><b>Effect</b></p>                                                                         | <p>There is <b>no impact</b> when looking south from this location</p>                                             |
| <p><b>Notes</b></p>                                                                          |                                                                                                                    |

Figure 11.35 Proposed View 03a

|                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View 03b           |                                                                                                                                                                                                                                                                                                                                                              |
| <b>Description</b> | One new tower is prominently visible through a gap in the vegetation from this location. The alignment with this gap at an information board makes this a locally dominant feature in this view of a relatively undeveloped natural landscape.                                                                                                                                                                                                  |
| <b>Effect</b>      | This is a <b>very significant, adverse effect</b> on the appearance and character of this location on account of the magnitude of the effect and the sensitivity of the receiving environment as part of a designated scenic view and recreational amenity area. The adverse effect is compounded by the incursion of the new feature onto this view of the Roman baths in the middle foreground, which is the focus of this information board. |
| <b>Notes</b>       |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

Figure 11.36 Proposed View 03b

|                                                                                                                    |                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 4a</b></p> <p><b>RECEIVED</b></p> <p>Kildare County Council<br/>Planning Department<br/>28 NOV 2022</p> |                                                                                               |
| <p><b>Description</b></p>                                                                                          | <p>There are very limited, intermittent partial views towards the development from this location – even with winter vegetation [as shown] on account of the dense vegetation</p> |
| <p><b>Effect</b></p>                                                                                               | <p>There is a <b>slight neutral</b> visual impact on the appearance and character of the landscape as seen from this location</p>                                                |
| <p><b>Notes</b></p>                                                                                                |                                                                                                                                                                                  |

Figure 11.37 Proposed View 4a

|                    |                                                                                                                                                                                                                              |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>View 04b</b>    |                                                                                                                                           |
| <b>Description</b> | There are very limited, intermittent partial views towards the development from this location – even with winter vegetation [as shown] on account of the dense vegetation. Visible conductors are closer than existing ones. |
| <b>Effect</b>      | There is a <b>slight-moderate</b> visual impact on the appearance and character of the landscape as seen from this location                                                                                                  |
| <b>Notes</b>       |                                                                                                                                                                                                                              |

Figure 11.38 Proposed View 04b

|                           |                                                                                                                                                                                  |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 04c</b></p>    |                                                                                               |
| <p><b>Description</b></p> | <p>There are very limited, intermittent partial views towards the development from this location – even with winter vegetation [as shown] on account of the dense vegetation</p> |
| <p><b>Effect</b></p>      | <p>There is a <b>slight-moderate</b> visual impact on the appearance and character of the landscape as seen from this location</p>                                               |
| <p><b>Notes</b></p>       |                                                                                                                                                                                  |

Figure 11.39 Proposed View 04c

|                           |                                                                                                                                                                                                                                                    |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 05a</b></p>    |                                                                                                                                                                 |
| <p><b>Description</b></p> | <p>One new Tower is prominently, if more distantly, visible from this location looking southward. The alignment with this pathway and steps makes this a locally prominent feature in this view of a relatively undeveloped landscape.</p>         |
| <p><b>Effect</b></p>      | <p>This is a <b>significant - moderate, adverse effect</b> on the appearance and character of this location on account of the magnitude of the effect and the sensitivity of the receiving environment as part of a recreational amenity area.</p> |
| <p><b>Notes</b></p>       |                                                                                                                                                                                                                                                    |

Figure 11.40 Proposed View 05a

|                                                                                                   |                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View 05b</b></p> <p>RECEIVED<br/>28 NOV 2022<br/>Planning Department<br/>County Council</p> |                                                                                                            |
| <p><b>Description</b></p>                                                                         | <p>There are very limited, intermittent partial views towards the development from this location looking west – even with winter vegetation [as shown] on account of the dense vegetation</p> |
| <p><b>Effect</b></p>                                                                              | <p>There is a <b>slight-moderate</b> visual impact on the appearance and character of the landscape as seen from this location</p>                                                            |
| <p><b>Notes</b></p>                                                                               |                                                                                                                                                                                               |

Figure 11.41 Proposed View 05b

|                    |                                                                                                                                                                                             |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>View 05c</b>    |                                                                                                          |
| <b>Description</b> | There are very limited, intermittent partial views towards the development from this location looking northwest – even with winter vegetation [as shown] on account of the dense vegetation |
| <b>Effect</b>      | There is a <b>slight-moderate</b> visual impact on the appearance and character of the landscape as seen from this location                                                                 |
| <b>Notes</b>       |                                                                                                                                                                                             |

**Figure 11.42 Proposed View 05bc**

|                                                                                                          |                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A1</b></p> <p>RECEIVED<br/>28 NOV 2022<br/>Planning Department<br/>Kildare County Council</p> |                                                                                    |
| <p><b>Description</b></p>                                                                                | <p>There is no visibility of any part of the proposed development from this location or the immediate environs on account of distance and intervening vegetation.</p> |
| <p><b>Effect</b></p>                                                                                     | <p>There will be <b>no impact</b> from this location</p>                                                                                                              |
| <p><b>Notes</b></p>                                                                                      |                                                                                                                                                                       |

Figure 11.43 Proposed View A1

|                    |                                                                                                                                                                |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>View A2a</b>    |                                                                             |
| <b>Description</b> | There is no visibility of any part of the proposed development from this location or the immediate environs on account of distance and intervening vegetation. |
| <b>Effect</b>      | There will be <b>no impact</b> from this location                                                                                                              |
| <b>Notes</b>       |                                                                                                                                                                |

**Figure 11.44 Proposed View A2a**

|                                                                                                           |                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A2b</b></p> <p>RECEIVED<br/>28 NOV 2022<br/>Planning Department<br/>Kildare County Council</p> |                                                                                    |
| <p><b>Description</b></p>                                                                                 | <p>There is no visibility of any part of the proposed development from this location or the immediate environs on account of distance and intervening vegetation.</p> |
| <p><b>Effect</b></p>                                                                                      | <p>There will be <b>no impact</b> from this location</p>                                                                                                              |
| <p><b>Notes</b></p>                                                                                       |                                                                                                                                                                       |

**Figure 11.45 Proposed View A2b**

|                           |                                                                                                                                                                                                                                                             |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A3a</b></p>    |                                                                                                                                                                          |
| <p><b>Description</b></p> | <p>Three structure are prominently visible across the view from the entrance to the car park. This is a localised view because of the dense tree planting along the eastern edge of Accommodation Road as well as the planting at the carpark entrance.</p> |
| <p><b>Effect</b></p>      | <p>This is a <b>significant local adverse</b> impact on account of the dominance of the visibility of the proposed structure.</p>                                                                                                                           |
| <p><b>Notes</b></p>       |                                                                                                                                                                                                                                                             |

**Figure 11.46 Proposed View A3a**

|                                                                                                   |                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A3b</b></p> <p>RECEIVED<br/>28 NOV 2022<br/>Planning Department<br/>County Council</p> |                                                                                                                                                                         |
| <p><b>Description</b></p>                                                                         | <p>Two structure are prominently visible across the view from the entrance to the car park. This is a localised view because of the dense tree planting along the eastern edge of Accommodation Road as well as the planting at the car park entrance.</p> |
| <p><b>Effect</b></p>                                                                              | <p>This is a <b>significant local adverse</b> impact on account of the dominance of the visibility of the proposed structure.</p>                                                                                                                          |
| <p><b>Notes</b></p>                                                                               |                                                                                                                                                                                                                                                            |

Figure 11.47 Proposed View A3b

|                           |                                                                                                                                                                                                                                                                         |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A4a</b></p>    |                                                                                                                                                                                      |
| <p><b>Description</b></p> | <p>An Intermediate tower, angle mast and conductors are prominently visible looking west from this location. The height and distance create a locally dominant feature</p>                                                                                              |
| <p><b>Effect</b></p>      | <p>This is a <b>very significant, adverse effect</b> on the appearance and character of this location on account of the magnitude of the effect and the sensitivity of the receiving environment as part of a designated scenic view and recreational amenity area.</p> |
| <p><b>Notes</b></p>       | <p>Notwithstanding the designation of the view, the recognised recreational status of the area the local environs here are also a developed area with existing artificial structures that are also visually conspicuous in the foreground and middle distance.</p>      |

**Figure 11.48 Proposed View A4a**

|                                                                                              |                                                                                                                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A4b</b></p> <p>Kildare County Council<br/>Planning Department<br/>28 NOV 2022</p> |                                                                                                                                                                                 |
| <p><b>Description</b></p>                                                                    | <p>Some conductors are visible looking north from this location. Towers visible on right are existing.</p>                                                                                                                                                         |
| <p><b>Effect</b></p>                                                                         | <p>This is a <b>slight effect</b> on the appearance and character of this location on account of the sensitivity of the receiving environment as part of a designated scenic view and recreational amenity area.</p>                                               |
| <p><b>Notes</b></p>                                                                          | <p>Notwithstanding the designation of the view, the recognised recreational status of the area the local environs here are also a developed area with existing artificial structures that are also visually conspicuous in the foreground and middle distance.</p> |

Figure 11.49 Proposed View A4b

|                    |                                                                                                                                                                      |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>View A5a</b>    |                                                                                   |
| <b>Description</b> | An angle mast and conductors are prominently visible from this location – notwithstanding the partial screening by the mature tree from this specific viewing point. |
| <b>Effect</b>      | This is a <b>significant local adverse</b> impact on account of the dominance of the visibility of the proposed structure                                            |
| <b>Notes</b>       |                                                                                                                                                                      |

**Figure 11.50 Proposed View A5a**

|                                                                                                           |                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| <p><b>View A5b</b></p> <p>RECEIVED<br/>28 NOV 2022<br/>Kildare County Council<br/>Planning Department</p> |                                    |
| <p><b>Description</b></p>                                                                                 | <p>Conductors are visible from this location</p>                                                                      |
| <p><b>Effect</b></p>                                                                                      | <p>This is a <b>slight adverse</b> impact on account of the dominance of the visibility of the proposed structure</p> |
| <p><b>Notes</b></p>                                                                                       | <p>The Station House is a Proposed Protected Structures; however it is located within a highly developed context</p>  |

Figure 11.51 Proposed View A5a

|                    |                                                                                                                                                                               |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>View A6a</b>    |                                                                                            |
| <b>Description</b> | Conductors will be visible looking south from this location. The angel mast and intermediate tower will be screened from view by intervening perimeter vegetation             |
| <b>Effect</b>      | There will be a <b>slight adverse</b> visual impact looking south from this location.                                                                                         |
| <b>Notes</b>       | Note that this viewing point is located within a designated recreational and amenity area that is also the context and setting for a number of proposed protected structures. |

**Figure 11.52 Proposed View A6a**

|                           |                                                                                                                                                                                                                                                                                                                                         |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A6b</b></p>    |                                                                                                                                                                                                                                                      |
| <p><b>Description</b></p> | <p>The upper portions of three structures and associated conductors will be prominently visible looking north-west from this location. Towers visible on right are existing.</p>                                                                                                                                                        |
| <p><b>Effect</b></p>      | <p>This is a <b>very significant, adverse</b> effect on the appearance and character of this location on account of the magnitude of the effect and the sensitivity of the receiving environment both as the context and setting of protected structures as well as part of a designated scenic view and recreational amenity area.</p> |
| <p><b>Notes</b></p>       | <p>The Roman Baths – a proposed protected structure – is visible in the foreground. This largely undeveloped view is the context and setting of this and other such structures.</p>                                                                                                                                                     |

**Figure 11.53 Proposed View A6b**

|                           |                                                                                                                                                                                                                                                    |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A7a</b></p>    |                                                                                                                                                                 |
| <p><b>Description</b></p> | <p>One new tower is prominently, visible from this location looking southward. The visibility within an amenity area makes this a locally prominent feature in this view of a relatively undeveloped landscape.</p>                                |
| <p><b>Effect</b></p>      | <p>This is a <b>significant - moderate, adverse effect</b> on the appearance and character of this location on account of the magnitude of the effect and the sensitivity of the receiving environment as part of a recreational amenity area.</p> |
| <p><b>Notes</b></p>       |                                                                                                                                                                                                                                                    |

Figure 11.54 Proposed View A7a

|                           |                                                                                                                                                                                                                                                    |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A7b</b></p>    |                                                                                                                                                                 |
| <p><b>Description</b></p> | <p>One new tower is prominently, visible from this location looking southward. The visibility within an amenity area makes this a locally prominent feature in this view of a relatively undeveloped landscape.</p>                                |
| <p><b>Effect</b></p>      | <p>This is a <b>significant - moderate, adverse effect</b> on the appearance and character of this location on account of the magnitude of the effect and the sensitivity of the receiving environment as part of a recreational amenity area.</p> |
| <p><b>Notes</b></p>       |                                                                                                                                                                                                                                                    |

**Figure 11.47 Proposed View A7b**

|                           |                                                                                                                                            |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A7c</b></p>    |                                                         |
| <p><b>Description</b></p> | <p>Existing dense vegetation means that there are no views of the proposed development looking west and north west from this location.</p> |
| <p><b>Effect</b></p>      | <p>There will be <b>no impacts</b> looking west and north west from this location.</p>                                                     |
| <p><b>Notes</b></p>       |                                                                                                                                            |

**Figure 11.47 Proposed View A7c**

|                           |                                                                                                                                     |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>View A8</b></p>     |                                                  |
| <p><b>Description</b></p> | <p>The upper portions of two structures are distantly visible, though not readily discernible from this elevated viewing point.</p> |
| <p><b>Effect</b></p>      | <p>There will be a <b>sight impact</b> on views looking westward from this location.</p>                                            |
| <p><b>Notes</b></p>       |                                                                                                                                     |

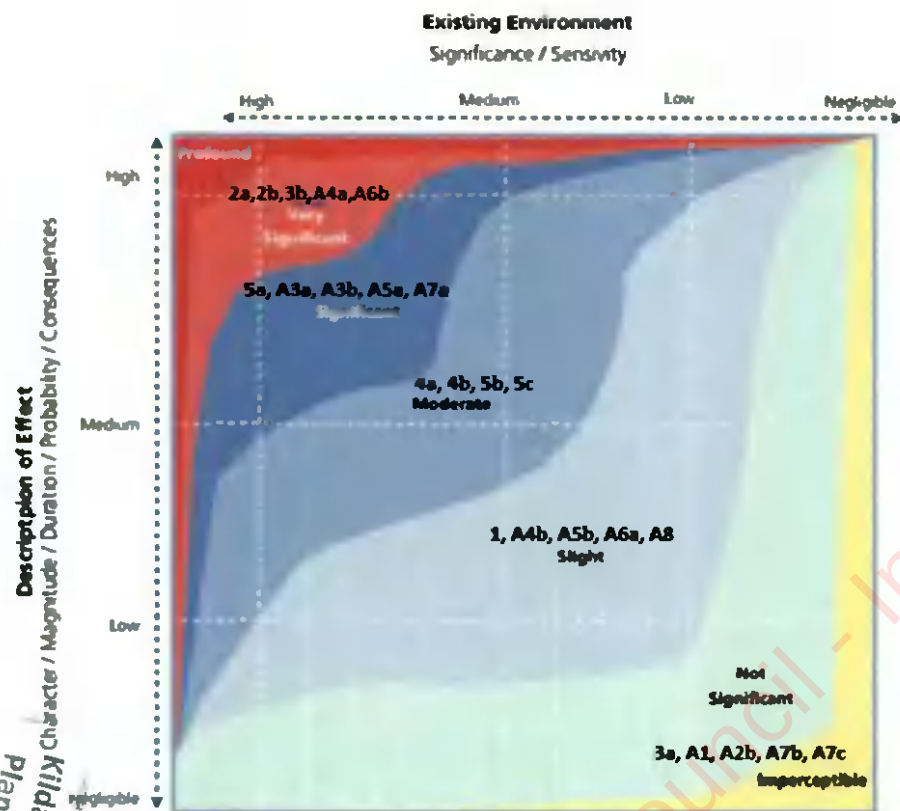
**Figure 11.55 Proposed View A8**

**Table 11.2 Summary of Visibility and Significance of Effect for Viewing Points**

| View | Location                                                                             | Visibility                                                                                                             | Significance of Context | Significance of Effect             |
|------|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------------|
| 1    | looking north-east on R449 Bridge Crossing Railway and Royal Canal & Royal Canal Way | One of the new towers is <b>distantly visible</b>                                                                      | Low                     | a slight, neutral                  |
| 2a   | on Louisa Bridge looking north-west                                                  | An angle mast and conductors are <b>prominently visible</b> from this location                                         | High                    | a very significant, adverse effect |
| 2b   | on Louisa Bridge looking north-west                                                  | An angle mast and conductors are <b>prominently visible</b> from this location                                         | High                    | very significant, adverse          |
| 3a   | from the path along the Royal Canal Way                                              | <b>No visibility</b> from this location when looking southward                                                         | High                    | No impact                          |
| 3b   | from the path along the Royal Canal Way                                              | One new Tower is <b>prominently visible</b> through a gap in the vegetation from this location                         | Very High               | very significant, adverse          |
| 4a   | from the path along the Royal Canal Way                                              | <b>very limited</b> , intermittent partial                                                                             | Very High               | slight-moderate                    |
| 4b   | from the path along the Royal Canal Way                                              | <b>very limited</b> , intermittent partial                                                                             | Very High               | slight-moderate                    |
| 4c   | from the path along the Royal Canal Way                                              | <b>very limited</b> , intermittent partial                                                                             | Very High               | slight-moderate                    |
| 5a   | from the path along the Royal Canal Way beside The Toll House                        | One new Tower is prominently, if more <b>distantly visible</b>                                                         | Very High               | significant - moderate, adverse    |
| 5b   | from the path along the Royal Canal Way beside The Toll House                        | <b>very limited</b> , intermittent partial                                                                             | Very High               | slight-moderate                    |
| 5c   | from the path along the Royal Canal Way beside The Toll House                        | There are <b>very limited, intermittent partial</b> views towards the development from this location looking northwest | Very High               | slight-moderate                    |
| A1   | from a public open space within The Woods, Easton                                    | There is <b>no visibility</b> of any part of the proposed development from this location                               | Local                   | No impact                          |
| A2a  | from a public open space Glen Easton View                                            | There is <b>no visibility</b> of any part of the proposed development from this location                               | Local                   | No impact                          |
| A2b  | open space Glen Easton View                                                          | There is <b>no visibility</b> of any part of the proposed development from this location                               | Local                   | No impact                          |
| A3a  | from a public car park at Oaklawn                                                    | Three structures are <b>prominently visible</b> across the view from the entrance to the car park                      | Local                   | significant local adverse          |

|     |                                                                                                    |                                                                                                                                                                                                                   |           |                                 |
|-----|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------|
| A3b | from a public car park at Oaklawn                                                                  | Two structures are <b>prominently visible</b> across the view from the entrance to the car park                                                                                                                   | Local     | significant local adverse       |
| A4a | elevated public walkway leading to the Leixlip [Louisa Bridge] Railway Station                     | An Intermediate tower, angle mast and conductors are <b>prominently visible</b> looking west from this location. The height and distance create a locally dominant feature                                        | Very High | a very significant, adverse     |
| A4b | elevated public walkway leading to the Leixlip [Louisa Bridge] Railway Station                     | Some conductors are <b>visible</b> looking north from this location                                                                                                                                               | Very High | slight                          |
| A5a | looking west from within the public access to the Leixlip [Louisa Bridge]                          | An angle mast and conductors are <b>prominently visible</b> from this location                                                                                                                                    | Local     | significant local adverse       |
| A5b | looking west from within the public access to the Leixlip [Louisa Bridge]                          | Conductors are <b>visible</b> from this location                                                                                                                                                                  | Local     | slight adverse                  |
| A6a | looking south from the vicinity of the Roman Bath and the Louisa Spa public Amenity Area           | Conductors will be <b>visible</b> looking south from this location. The angel mast and intermediate tower will be screened from view by intervening perimeter vegetation                                          | Very High | Slight adverse                  |
| A6b | looking west from the vicinity of the Roman Bath and the Louisa Spa public Amenity Area            | The upper portions of three structures and associated conductors will be <b>prominently visible</b> looking north-west from this location.                                                                        | Very High | very significant, adverse       |
| A7a | looking south from a public path within an amenity area leading towards the Leixlip Waterfall      | One new Tower is <b>prominently visible</b> from this location looking southward. The visibility within an amenity area makes this a locally prominent feature in this view of a relatively undeveloped landscape | Very High | significant - moderate, adverse |
| A7b | looking south from a public path within an amenity area leading towards the Leixlip Waterfall      | One new Tower is <b>prominently visible</b> from this location looking southward. The visibility within an amenity area makes this a locally prominent feature in this view of a relatively undeveloped landscape | Very High | significant - moderate, adverse |
| A7c | looking north west from a public path within an amenity area leading towards the Leixlip Waterfall | Existing dense vegetation means that there are <b>no visibility</b> of the proposed development looking west and north west from this location.                                                                   | Very High | No Impact                       |
| A8  | looking west from public open space in River Forest, Newtown, Confey                               | The upper portions of two structures are distantly visible, though <b>not readily</b>                                                                                                                             | Local     | Slight                          |

|  |  |                                                      |  |  |
|--|--|------------------------------------------------------|--|--|
|  |  | <b>discernible</b> from this elevated viewing point. |  |  |
|--|--|------------------------------------------------------|--|--|



There are seven generalised degrees of effect significance that are commonly used in EIA. Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant and Profound. Generalised definitions of each of these are provided in Table 3.4. When more specific definitions exist within a specialised factor or topic, e.g. biodiversity, these should be used in preference to these generalised definitions. (ref. Advice Notes<sup>44</sup>.)

**Figure 11.56 Calibration of Impact Significance Against EPA Guidelines**

## **11.5 IMPACTS ON WIDER LANDSCAPE**

### **11.5.1 IMPACTS ON THE LOCAL LANDSCAPE**

The proposed development will give rise to effects that will be seen in the context of an established industrial site. Changes to the appearance will be discernible from one viewing point along the Viaduct across the Canal but will not alter the appearance or character of the wider area.

#### **11.5.1.1 Cumulative and In-combination Effects**

##### **11.5.1.2 Impacts on Heritage**

The upper portion of one or more structure will be significantly visible from the context and setting of Proposed Protected Structures including the Royal Canal Viaduct, the Romanesque Baths, the Hexagonal Bath and the Toll House.

The project will not be visible from Carton, The Obelisk or Leixlip Castle or other important heritage structures or sites in the vicinity.

##### **11.5.1.3 Impacts on Amenities**

The project will significantly alter or affect views from amenities in the area – such as views from the Canal, the Aqueduct and associated walks. These will be intermittent and highly localised due to the local screening afforded by vegetation and topography.

##### **11.5.1.4 Impacts on Residents**

The proposed developments will alter the views from some Louisa Park Apartments where these are not screened by existing mature vegetation. All such visibility will be in the highly developed context of the existing station and mainline rail line.

The new development will not give rise to any change in the established view towards a large industrial development that is distantly visible from the environs of some houses to the south

##### **11.5.1.5 Impacts on Roads**

The structures will alter views from the R148 between Louisa Bridge and the Easton Roundabout.

### **11.5.2 IMPACTS ON VIEWS TO, FROM & BETWEEN PROTECTED STRUCTURES**

In response to concerns about potential effects on views to, from and between heritage structures it was necessary during a previous assessment to attempt to obtain access to structures that do not currently permit public access namely;

- Prospect Tower
- The Obelisk
- The Wonderful Barn
- Leixlip Castle



**Figure 11.57 Intel in relation to long distance views**

These were visited by the impact assessors – accompanied by relevant officials – to enable observations to be made to assess the existence of inter-visibility and visibility, resulting in the following findings:

- Prospect Tower – has no remaining internal stairs or floors that would permit public or practicable survey access above ground floor to obtain the required view.
- The Obelisk – is not currently accessible. There may be future public access, by arrangement. Survey work from high-level view point confirms no visibility of the site is possible from this location
- The Wonderful Barn – access is currently prohibited. There is currently no public access permitted onto the Wonderful Barn, there may be future public access, by arrangement. Photos from the top of the Barn show that all views consist of significant levels of development in the immediate environs. The upper portions of intel developments, including existing transmission structures, are distantly visible. The configuration of this visibility will change when seen from this location, though neither the character of the view, nor the context and setting of the Barn will be affected.
- Leixlip Castle – there is no intervisibility between the site of the proposed development

## 11.6 MITIGATION AND MONITORING MEASURES

The proposed development will take place on and adjacent to lands zoned for industrial use with an established industrial appearance. The principle mitigation method employed was route selection following an extensive consideration of alternative routings that included both Overground as well as underground options.

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## **11.7 RESIDUAL IMPACTS**

There will be a localised intensification of effects on nearby amenities around the Royal Canal. These will represent a localised intensification and spatial expansion of pre-existing effects that accord with the zoning and established use of these lands.

## **11.8 CUMULATIVE ASSESSMENT**

The proposed development will further extend the intensification of development and urbanisation of the metropolitan urbanised fringe between the greater Dublin environs and the rural environs of north Kildare.

## 12 MATERIAL ASSETS

### 12.1 INTRODUCTION

The prescribed environmental factor of Material Assets is described in the 2017 EPA Guidelines as including built services and infrastructure.

The related topics of water (supply and waste water) are separately addressed in other chapters of this EIAR.

In this EIAR, the impacts on the various material assets described above are principally addressed in various chapters, principally:

- Chapter 8 *Water & Hydrology*
- Chapter 13 *Waste Management*

This chapter covers the proposals for built services (except traffic) - comprising, energy demand and supply (electrical and gas) and water services.

### 12.2 ENERGY DEMAND

There will be low use of fuel and electricity during the construction phase because of the nature of the project. Resources consumed will mainly include use of fuels for construction related machinery, electricity to light the site and power construction tools.

The proposed development is an energy project that will divert and decommission existing transmission infrastructure, but not disrupt energy supplies, during the carrying out of the project.

### 12.3 WATER

Minor connection will be made to the existing Intel supply in a designated area of Intel's car park close to IR96 ground floor main contractor area for temporary site offices, and minor welfare amenities.

There will be no connection for water supply or discharges of waste water required during the operational phased of the proposed development. This is further discussed in Chapter 8 *Water & Hydrology*.

### 12.4 RELOCATION OF EXISTING SERVICES

A review of existing utilities mapping and silt trenching has been carried out to identify any existing services that may be impacted on by the proposed development.

#### 12.4.1 WATER MAIN

During slit trenching at Tower 2 concrete was identified running across both trenches which indicated the presence of a service within the concrete casing. Upon review with existing utilities mapping, it was found out to be an existing watermain. This watermain will be diverted prior to the excavation of the foundation for the tower.

#### 12.4.2 MEDIUM VOLTAGE CABLE

On the location of Tower 3, the existing service drawing shows the presence of an MV cable, this was also identified by a Cable Avoidance Tool (CAT).

The water main at Tower 2 and MV cable at Tower 3 as outlined in above will be diverted in advance of the tower foundation installations at these locations.

### **12.4.3 HIGH VOLTAGE TRANSMISSION LINE**

The proposed development will relocate the existing high voltage lines – as described in detail in the planning application.

28 NOV 2022

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# 13 WASTE MANAGEMENT

## 13.1 INTRODUCTION

This Chapter of the EIAR comprises an assessment of the likely impact of the proposed development on the waste generated from the development as well as identifying proposed mitigation measures to minimise any associated impacts.

A site-specific Resource Waste Management Plan (RWMP) has been prepared by AWN Consulting Ltd to deal with waste generation during the demolition, excavation and construction phases of the proposed development and has been included as Appendix 13.1. The RWMP was prepared in accordance with the Environmental Protection Agency's (EPA) document 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) and 'Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects' document produced by the National Construction and Demolition Waste Council (NCDWC) in conjunction with the Department of the Environment, Heritage and Local Government (DoEHLG)(2006).

The Chapter has been prepared in accordance with European Commissions Guidelines, Guidance on the preparation of the Environmental Impact Assessment Report (2017), the EPA Guidelines on the Information to be contained in EIAR (2022) and the EU Commission Notice on changes and extensions to projects, 2021.

These documents will ensure the management of wastes arising at the Development Site in accordance with legislative requirements and best practice standards.

### 13.1.1 METHODOLOGY

The assessment of the impacts of the proposed development, arising from the consumption of resources and the generation of waste materials, was carried out taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports. This Chapter is based on the proposed development, as described in Chapter 4 *Proposed Development* and considers the following aspects:

- Legislative context;
- Construction phase (including demolition, site preparation and excavation);
- Operational phase; and
- Decommissioning Phase

A desktop study was carried out which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that will be generated during the Construction and Operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction and operational phases of the proposed development have been calculated and are included in Section 13.3 of this chapter. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

Mitigation measures are proposed to minimise the effect of the proposed development on the environment during the construction and operational phases, to promote efficient waste segregation and to reduce the quantity of waste requiring disposal. This information is presented in Section 13.5. A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 7 *Land, Soils, Geology and Hydrogeology* of this EIA.

### 13.1.2 LEGISLATION AND GUIDANCE

Waste management in Ireland is subject to EU, national and regional waste legislation and control, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the Waste Framework Directive (2008/98/EC) which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the Waste Management Act 1996 (as amended). European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for reuse > recycling > recovery > disposal) (Figure 13.1).



**Figure 13.1 Waste Hierarchy (Source: European Commission)**

EU and Irish National waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products. (Figure 13.2).



**Figure 13.2 Circular Economy<sup>34</sup>**

The Irish government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The most recent policy document, Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland, was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national waste targets is due to the Irish and international waste context changing in the years since the launch of the previous waste management plan, A Resource Opportunity, in 2014.

One of the first actions to be taken from the WAPCE was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, using Less' (2021) to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The strategy for the management of waste from the construction phase is in line with the requirements of the EPA's 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021). The guidance documents, Best Practice Guidelines for the Preparation of Waste Management Plans for Construction and Demolition Projects and Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers (FÁS & Construction Industry Federation, 2002), were also consulted in the preparation of this assessment. There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including the Eastern Midlands Region (EMR) Waste Management Plan 2015 – 2021, BS 5906:2005 Waste Management in Buildings – Code of Practice, the Kildare County Council (KCC) Kildare County Council Waste Management (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-Laws 2018, the EPA National Waste Database Reports 1998 – 2018 and the EPA National Waste Statistics Web Resource.

<sup>34</sup> Source: Repak

### 13.1.3 TERMINOLOGY

Note that the terminology used herein is consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

**Waste** - Any substance or object which the holder discards or intends or is required to discard.

**Prevention** - Measures taken before a substance, material or product has become waste, that reduce:

- the quantity of waste, including through the re-use of products or the extension of the life span of products;
- the adverse impacts of the generated waste on the environment and human health; or
- the content of harmful substances in materials and products.

**Reuse** - Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.

**Preparing for Reuse** - Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.

**Treatment** - Recovery or disposal operations, including preparation prior to recovery or disposal.

**Recovery** - Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.

**Recycling** - Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

**Disposal** - Any operation which is not recovery even where the operation has as a secondary consequence the reclamation of substances or energy. Annex I of the Waste Framework Directive sets out a non-exhaustive list of disposal operations.

## 13.2 PROPOSED DEVELOPMENT

The proposed development consists of the re-alignment of an overhead electricity power line, located to the east side at their site at Collinstown, Leixlip, Blakestown, Kellystown, Collinstown Industrial Park, Leixlip, Co. Kildare. The proposed development consists of the realignment of an approximate 1.1 km section of the existing Maynooth-Ryebrook 110kV double circuit overhead line.

A full description of the proposed development can be found in Chapter 4 *Proposed Development*. The characteristics of the proposed development that are relevant in terms of waste management are summarised below.

### 13.2.1 DEMOLITION PHASE

There will be waste materials generated from the demolition/dismantling of existing towers DCINT29 to DCINT32 (4 no. total) suspension type as well as from the excavation of the pylon foundations. However as the majority of this material will be metal it will be highly reusable and recyclable.

The volume of waste generated from demolition will be more difficult to segregate than waste generated from the construction phase, as some of the materials will be bonded together or integrated i.e. steel lattice tower foundations embedded in concrete etc.

Due to the nature of the majority of the material removed steel masts, electrical infrastructure, fibre wrap a high rate of recycling is anticipated.

**Table 13.1 Predicted on and off-site reuse, recycle and disposal rates for demolition waste**

| Waste Type                                                               | Tonnes      | Reuse/Recovery |            | Recycle |             | Disposal |            |
|--------------------------------------------------------------------------|-------------|----------------|------------|---------|-------------|----------|------------|
|                                                                          |             | %              | Tonnes     | %       | Tonnes      | %        | Tonnes     |
| Wood, glass and plastic                                                  | 0.1         | 0              | 0.0        | 85      | 0.1         | 15       | 0.0        |
| Concrete, Bricks, Tiles, Ceramics                                        | 0.6         | 30             | 0.2        | 65      | 0.3         | 5        | 0.1        |
| Bituminous mixtures, coal tar and tarred products                        | 0.5         | 0              | 0.0        | 25      | 0.1         | 75       | 0.4        |
| Metals (including their alloys), mixed metals, iron and steel, and cable | 27.9        | 5              | 1.4        | 95      | 26.5        | 0        | 0.0        |
| Treated wood, glass, plastic, containing hazardous substances            | 5.0         | 10             | 0.5        | 60      | 3.0         | 30       | 1.5        |
| <b>Total</b>                                                             | <b>34.1</b> |                | <b>2.1</b> |         | <b>33.0</b> |          | <b>2.1</b> |

### 13.2.2 CONSTRUCTION PHASE

It is expected that wastes generated (other than excavated material) from other construction activities will be negligible as the majority of the structures are pre-fabricated offsite and foundations for the joint bays, and new transmission masts will require the excavation of soil, stone, gravel, clay and made ground.

Portable welfare and sanitary facilities will be provided for the contractors so sewage sludge will be generated from pumping out of the portable facilities. Contractors will consume food offsite so it is not expected that there will be any waste from contractors breaks and lunches.

Site preparation, excavations for foundations for transmission masts has been estimated to generate 1,320 m<sup>3</sup> soil, stone, gravel, clay and made ground. These estimates will be refined prior to commencement of construction. It is anticipated that 740 m<sup>3</sup> of the material will be removed off site for reuse/recovery and recycle, with the remaining 580 m<sup>3</sup> being reused as backfill where possible.

If the material that requires removal from site is deemed to be a waste, removal and reuse/recycling/recovery/disposal of the material will be carried out in accordance with the Waste Management Act 1996 (as amended), the Waste Management (Collection Permit) Regulations 2007 (as amended) and the Waste Management (Facility Permit & Registration) Regulations 2007 (as amended). The volume of waste requiring recovery/disposal will dictate whether a Certificate of Registration is required.

#### Construction Waste Materials

It is expected that wastes generated (other than excavated material and trees/shrubbery) from other construction activities will be negligible and will generally comprise waste generated from construction workers. These wastes would generally be organic/food waste, dry mixed recyclables (waste paper, newspaper, plastic bottles, packaging, aluminium cans, tins and Tetra Pak cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided at the site compound during the construction phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices. The construction compound will facilitate office, portable sanitary facilities, equipment storage, parking etc. for contractors.

Further detail on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP included as Appendix 13.1 of the EIA Appendices document.

### 13.2.3 OPERATIONAL PHASE

During normal operations, no waste will be generated or stored at the proposed development. It is anticipated that imperceptible amount of waste will be generated from ESB Networks staff during their inspections and maintenance works. All waste generated will be removed from site by ESB Networks staff or contractors.

## 13.3 RECEIVING ENVIRONMENT

In terms of waste management, the receiving environment is largely defined by KCC as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the *Eastern Midlands Region Waste Management Plan 2015 – 2021*, which sets out the following targets for waste management in the region:

- A 1% reduction per annum in the quantity of household waste generated per capita over the period of the plan;
- Achieve a recycling rate of 55% of managed municipal waste by 2025; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of "70% preparing for reuse, recycling and other recovery of construction and demolition waste" (excluding natural soils and stones and hazardous wastes) to be achieved by 2020.

Ireland achieved 84 per cent material recovery of such waste in 2019, and therefore surpassed the 2020 target and is currently surpassing the 2025 target. The National Waste Statistics update published by the EPA in November 2021 identifies that Ireland's current against "Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass (includes metal and plastic estimates from household WEEE)" was met for 2020 at 51% however they are currently not in line with the 2025 target (55%).

The Kildare County Development Plan 2017 – 2023 (2017), the Draft Kildare County Development plan 2023-2029 (2022) and the Leixlip Local Area Plan 2020-2023 (2020) set out policies and objectives for the KCC area which reflect those sets out in the regional waste management plan.

In terms of physical waste infrastructure, KCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the EMR Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, municipal waste landfills, material recovery facilities and waste transfer stations.

## 13.4 PREDICTED EFFECTS

This section details the potential waste effects associated with the proposed development.

### 13.4.1 CONSTRUCTION PHASE

The proposed development will generate a range of non-hazardous and hazardous waste materials during site demolition, excavation and construction (see Appendix 13.1 for further detail). General housekeeping and packaging will also generate waste materials, as well as typical municipal wastes generated by construction employees, including food waste. Waste materials will be required to be temporarily stored in the construction site compound or adjacent to it, on-site pending collection by a waste contractor. If waste material is not managed and stored correctly, it is likely to lead to litter or

pollution issues at the Development Site and in adjacent areas. The indirect effect of litter issues is the presence of vermin in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant and negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant and negative**.

Wastes arising will need to be taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the EMR which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the Development Site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials are either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant and negative**.

There is a quantity of excavated material which will need to be excavated to facilitate the proposed development. A detailed review of the existing ground conditions on a regional, local site-specific scale are presented in Chapter 7. It is anticipated that c. 1,380 m<sup>3</sup> of excavated material will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant and negative**.

#### 13.4.2 OPERATIONAL PHASE

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy which would lead to small volumes of waste being sent unnecessarily to landfill.

No waste will be generated or stored at the proposed development during normal operations. All waste will be removed by ESB Networks staff and contractors and therefore there will be no potential impacts from the development once operational.

#### 13.4.3 DO NOTHING SCENARIO

If the proposed development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no demolition, excavation, construction or operational at this site. There would, therefore, be a neutral effect on the environment in terms of waste.

### 13.5 MITIGATION MEASURES

This section outlines the measures that will be employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

The concept of the 'waste hierarchy' is employed when considering all mitigation measures. The waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal.

### 13.5.1 CONSTRUCTION PHASE

The following mitigation measures will be implemented during the construction phase of the proposed development:

As previously stated, a project specific RWMP has been prepared in line with the requirements of the requirements of The EPA, *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects* (2021) and is included as Appendix 13.1. The mitigation measures outlined in the RWMP will be implemented in full and form part of mitigation strategy for the site. The mitigation measures presented in this RWMP will ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the proposed development.

- Prior to commencement, the appointed Contractor(s) will be required to refine / update the RWMP (Appendix 13.1) in agreement with KCC and in compliance with any planning conditions, or submit an addendum to the RWMP to KCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor will implement the RWMP throughout the duration of the proposed excavation and construction phases.

It has been calculated by the project design team that 740m<sup>3</sup> of excavated material will need to be removed off-site. Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that will not impact negatively on workers as well as on water and soil environments, both on and off-site.

In addition, the following mitigation measures will be implemented:

- Building materials will be chosen to 'design out waste';
- On-site segregation of waste materials will be carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, will be segregated:
  - Concrete rubble (including ceramics, tiles and bricks);
  - Metals;
  - Glass;
  - Hazardous material; and
  - Timber.
- Left over materials (e.g. timber off-cuts, broken concrete blocks / bricks) and any suitable construction materials shall be re-used on-site, where possible; (alternatively, the waste will be sorted for recycling, recovery or disposal);
- All waste materials will be stored in skips or other suitable receptacles in designated areas of the site;
- Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) will also be segregated and will be stored in appropriate receptacles (in suitably bunded areas, where required);
- A Resource Manager will be appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;
- All construction staff will be provided with training regarding the waste management procedures;
- All waste leaving site will be reused, recycled or recovered, where possible, to avoid material designated for disposal;
- All waste leaving the site will be transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities; and
- All waste leaving the site will be recorded and copies of relevant documentation maintained.

Nearby sites requiring clean fill material will be contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this will be done in accordance with regulation 15 (By-products) (Previously Article 27 of the European Communities (Waste Directive) Regulations 2011) of S.I. No. 323/2020 - European

Union (Waste Directive) Regulations 2020. EPA approval will be obtained prior to moving material as a by-product.

These mitigation measures will ensure that the waste arising from the construction phase of the proposed development is dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, and the EMR Waste Management Plan 2015 – 2021. It will also ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and will promote more sustainable consumption of resources.

### 13.5.2 OPERATIONAL PHASE

No waste will be generated during normal operational, potential impacts imperceptible, and no operational mitigation measures will be required.

## 13.6 RESIDUAL IMPACTS

The implementation of the mitigation measures outlined in Section 13.5 and in Appendix 13.1 will ensure that high rates of reuse, recovery and recycling are achieved at the Site of the proposed development during the construction and operational phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

### 13.6.1 CONSTRUCTION PHASE

A carefully planned approach to waste management as set out in Section 13.5.1 and adherence to the RWMP (which include mitigation) (Appendix 13.1) during the construction phase will ensure that the predicted effect on the environment will be **short-term, imperceptible and neutral**.

### 13.6.2 OPERATIONAL PHASE

No waste will be generated during operation and therefore there will be no predicted impacts from the development, once operational.

### 13.6.3 CONCLUSION

The full and proper implementation of the mitigation measures set out herein and, in the RWMP (Appendix 13.1), no likely significant negative effects are predicted to occur as a result of the construction or operational of the proposed development.

## 13.7 CUMULATIVE IMPACTS

The following considers the cumulative impacts of the proposed development and proposed and permitted and operating facilities in the surrounding area in relation to Material Assets – Waste Management. This considers the proposed development and other surrounding proposed and permitted developments considered in Chapter 4.

As has been identified in the receiving environment section all cumulative developments that are already built and in operation contribute to our characterisation of the baseline environment. As such any further environmental impacts that the proposed development may have in addition to these already constructed and operational cumulative developments has been assessed in the preceding sections of this chapter.

### 13.7.1 CONSTRUCTION PHASE

There are existing residential and commercial developments close by, along with the multiple permissions remaining in place in the area. In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase.

Due to the high number of waste contractors in the Kildare region as provided from the National Waste Collection Permit Office and the Environmental Protection Agency there would be sufficient contractors available to handle waste generated from a large number of these sites simultaneously, if required. Similar waste materials would be generated by all the developments.

Other developments in the area will be required to manage waste in compliance with national and local legislation, policies and plans which will mitigate against any potential cumulative effects associated with waste generation and waste management. As such the effect will be **short-term, imperceptible and neutral**.

### 13.7.2 OPERATIONAL PHASE

No waste will be generated during operation and therefore there will be no cumulative impact.

## 13.8 INTERACTIONS

This section discusses interactions between this Chapter and other specialist environmental topics considered in this EIA.

### 13.8.1 LAND, SOILS, GEOLOGY & HYDROGEOLOGY

During the construction phase, excavated soil, stone, gravel, clay and made ground (c.1,320 m<sup>3</sup>) will be generated from the excavations required to facilitate site levelling and construction of new foundations. It is estimated that 740m<sup>3</sup> excavated material will need to be removed off-site. Where material has deemed unsuitable or is unable to be reused onsite it will be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 13 and the requirements of the RWMP (Appendix 13.1), will ensure the effect is **long-term, imperceptible and neutral**.

### 13.8.2 POPULATION AND HUMAN HEALTH

The potential impacts on human beings are in relation to incorrect management of waste during construction phase, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP (Appendices 13.1), and the mitigation measures in Chapter 13, will ensure appropriate management of waste and avoid any negative impacts

# 14 BUILT HERITAGE

## 14.1 INTRODUCTION/METHODOLOGY

This chapter has been prepared following inspection and survey of the surrounding context; architectural and historical research, including that carried out previously and by others which have informed an understanding of the development and significance of the site and its surroundings, its heritage values and components and the conservation values associated with that fabric.

This chapter examines the potential impact of the proposed development on architectural and cultural heritage, both in close proximity to the site and, in the case of architectural or cultural sites of great significance, well beyond the site location. The assessment draws on the montages that have been prepared to show how the proposed buildings would appear from a number of significant viewing points at or near to sites of architectural or cultural significance.

The text of this chapter has been prepared with reference to a range of relevant documents, including historic maps, historical writings, local and county plans and national guidelines.

These are referenced through the assessment.

**Cultural Heritage** – As defined in Article 1 of 17<sup>th</sup> Session of UNESCO<sup>35</sup>.

*"For the purposes of this Convention, the following shall be considered as "cultural heritage":*

- *monuments: architectural works, works of monumental sculpture and painting, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science;*
- *groups of buildings: groups of separate or connected buildings which, because of their architecture, their homogeneity or their place in the landscape, are of outstanding universal value from the point of view of history, art or science;*
- *sites: works of man or the combined works of nature and man, and areas including archaeological sites which are of outstanding universal value from the historical, aesthetic, ethnological or anthropological point of view."*

### 14.1.1 SCOPING AND SCREENING

This chapter focusses mainly upon the presence of protected structures in close proximity to the subject lands and upon any impacts, positive or negative, that the proposed development may have upon these structures.

It considers and assesses impacts upon protected structures noted within the Register of Protected Structures (RPS) of the current Kildare County Council Development Plan 2017 – 2023, and upon those proposed additions to the RPS on the Draft Kildare County Council Development Plan 2023 – 2029.

The study area varies according to the significance of the protected structure and the potential of the proposed development to impact upon that structure.

While the primary focus is upon any such protected structures as might be located within the application site, within the adjacent lands or within reasonably close proximity, determined as being within 1.2Km of the nearest element of the proposed works or within a critical view as per the Kildare County Development plan. There are a number of highly sensitive and significant heritage structures

<sup>35</sup> The General Conference of the United Nations Educational, Scientific and Cultural Organization meeting in Paris from 17 October to 21 November 1972, at its seventeenth session:

and environments in the broader locality such as for example: Carton House and Demesne, the Conolly Folly and the Wonderful Barn, which have also been included in the assessment as the preservation of views affecting these structures are specifically policies of the Kildare County Development Plan.

This chapter also considers architectural conservation areas in the vicinity and buildings or other structures that are of some historic or architectural interest, even though they may not be protected structures.

There are three architectural conservation areas in the general vicinity of the application site, one in the centre of Leixlip, one in the centre of Maynooth and the third in the centre of Celbridge. These are at distances of approximately 1.5 kilometres, 5.6 kilometres and 4.0 kilometres respectively and are all separated from the application site by topography, trees and buildings.

In view of the remoteness of the site from Leixlip Maynooth and Celbridge no detailed assessment has been undertaken as part of this review.

A number of structures that are not protected structures or proposed for inclusion into the RPS but which are of architectural interest have been identified as lying within or close to the application site. These comprise: the Royal Canal (Blakestown, Collinstown and Leixlip) Nelson's Cottage (fronting on to the R148), the Lock Keepers Cottage at Collinstown and Blakestown House. These structures are also assessed.

This assessment considers relevant heritage structures within and in the vicinity of the application site and assesses the anticipated effects of the proposed development upon the character and significance of those structures.

The emphasis is on structures that remain in situ, either intact or in fragmentary or ruinous form. Where a building or other structure has been destroyed it may leave traces that fall within the ambit of the archaeological assessment. It may also have had an importance that remains through the historical record, though this is not of concern to the present task.

The identification of buildings and structures to be assessed for impact has been based upon the current and proposed RPS record, the NIAH record, Development Plan Mapping and upon historic map records and historic and current Ordnance Survey mapping.

The following represent some of the primary mapping resources:

- The Kildare County Development Plan 2017-2023
- The Draft Kildare County Development Plan 2023 - 2029
- Leixlip Local Area Plan 2017-2023
- Down Survey map of Kildare, 1655
- Pre-Ordnance Survey maps by Noble and Keenan (1752) and Alexander Taylor (1783)
- Ordnance Survey six-inch maps of 1837 and 1870
- Ordnance Survey 1:2500 maps of 1907
- National Inventory of Architectural Heritage

A desktop survey was initiated in which the entries in the record of relevant protected structures (RPS) for County Kildare on both the current (2017-2023) and draft (2023 – 2029) Kildare County Development plans were initially identified.

Following this exercise the NIAH Mapping record for Kildare was consulted to seek to identify any known heritage structures which have not as yet been identified within the RPS.

The pre-OS Mapping record was then investigated and relevant structures of interest on or close to the application site that were identified were compared for continuity against those on the historic post 1824 OS Mapping record and were then checked against the current Ordnance Survey maps to ascertain which were still extant.

The site and its vicinity were examined on foot in order to identify those structures noted in the aforementioned desktop survey and to assess their architectural quality.

The possibility of finding structures of architectural significance that were not identified from the desktop assessment was kept in mind during the site work and any potential additional structures were examined.

The structures of heritage significance that were identified in this process were examined to assess the potential effects of the proposed development and to consider potential for mitigation where necessary.

In each case the structures identified are rated in accordance with the system adopted by the National Inventory of Architectural Heritage (NIAH) wherein a structure is rated as being of International, National, Regional or Local interest, or, if a structure is of no special interest, the NIAH includes a category of "Record only"<sup>45</sup>.

The definitions for each of these categories is as follows:

#### International:

Structures or sites of sufficient architectural heritage importance to be considered in an international context. Examples include St Fin Barre's Cathedral, Cork. These are exceptional structures that can be compared to and contrasted with the finest architectural heritage in other countries.

#### National

Structures or sites that make a significant contribution to the architectural heritage of Ireland. These are structures and sites that are considered to be of great architectural heritage significance in an Irish context. Examples include Ardnacrusha Power Station, Co. Clare; the Ford Factory, Cork; Carroll's Factory, Dundalk; Lismore Castle, Co. Waterford; Sligo Courthouse, Sligo; and Emo Court, Co. Laois.

#### Regional

Structures or sites that make a significant contribution to the architectural heritage within their region or area. They also stand in comparison with similar structures or sites in other regions or areas within Ireland. Examples would include many Georgian terraces; Nenagh Courthouse, Co. Tipperary; or the Bailey Lighthouse, Howth. Increasingly, structures that need to be protected include structures or sites that make a significant contribution to the architectural heritage within their own locality. Examples of these would include modest terraces and timber shopfronts.

#### Local

These are structures or sites of some vintage that make a contribution to the architectural heritage but may not merit being placed in the RPS separately. Such structures may have lost much of their original fabric.

#### Record only

These are structures or sites that are not deemed to have sufficient presence or inherent architectural or other importance at the time of recording to warrant a higher rating. It is acknowledged, however, that they might be considered further at a future time. The legislation relating to the protection of architectural heritage is set down in

the Planning and Development Act 2000, as amended, and this defines architectural heritage as including structures which are of special interest under the headings of architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

Wherever the phrase "special architectural interest" is used in this report it should be taken as including special interest in any one or more of these eight categories.

In this assessment each building or structure that is considered is assigned a rating in accordance with the NIAH system or is stated to be not of special architectural interest. Where the rating is deemed to be higher than "Record only" the category of special interest is noted.

It should be noted that the term "special architectural interest" applies only in the context of this assessment of architectural heritage and does not imply that those buildings and other structures that are not considered to be of special architectural interest are in any way inferior or are of lower value.

## **14.1.2 STATUTORY CONTEXT**

### **14.1.2.1 Planning and Development Acts**

The Planning and Development Acts, 2000-2018 provide for the protection of architectural heritage in Ireland. This legislation was introduced in order to fulfil Ireland's obligations under the Granada Convention, or The Convention for the Protection of the Architectural Heritage of Europe, which was adopted by the European Community in 1985, came into force in 1987 and was ratified by Ireland in 1997. This convention reinforces and promotes policy for the conservation and enhancement of Europe's heritage and affirms the need for Europe's solidarity in relation to heritage conservation.

Part IV of the Planning and Development Acts relates to Architectural Heritage. Amongst other provisions it introduced the concept of the protected structure, which is defined in section 2 of the act as follows:

"protected structure" means— (a) a structure, or (b) a specified part of a structure, which is included in a record of protected structures, and, where that record so indicates, includes any specified feature which is within the attendant grounds of the structure and which would not otherwise be included in this definition;

Section 51 of the act requires a planning authority to include a record of protected structures in its development plan "for the purpose of protecting structures, or parts of structures, which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest".

It also makes it obligatory for the planning authority to include within that record of protected structures "every structure which is, in the opinion of the planning authority, of such interest within its functional area."

This obligation is addressed nationally through the inclusion of a Record of Protected Structures in the relevant County Development Plan.

In his instance the relevant RPS is set down in the current Kildare County Development Plan 2017-2023 and in the Draft Kildare County Development Plan 2023-2029.

### **14.1.2.2 Kildare County Council Development Plan 2017 - 2023**

Chapter 12 of the Development Plan contains a number of relevant Policies and Objectives relating to architectural and built heritage, as follows:

Policies: Protected Structures

It is the policy of the Council to:

**PS 1** Conserve and protect buildings, structures and sites contained on the Record of Protected Structures of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

**PS 2** Protect the curtilage of protected structures or proposed protected structures and to refuse planning permission for inappropriate development within the curtilage or attendant grounds of a protected structure which would adversely impact on the special character of the protected structure including cause loss of or damage to the special character of the protected structure and loss of or damage to, any structures of architectural heritage value within the curtilage of the protected structure. Any proposed development within the curtilage and/or attendant grounds must demonstrate that it is part of an overall strategy for the future conservation of the entire built heritage complex and contributes positively to that aim.

**PS 3** Require that new works will not obscure views of principal elevations of protected structures.

**PS 5** Maintain the views from Castletown House to the River Liffey and to maintain views along paths within the curtilage of the House.

**PS 6** Maintain the views to and from Carton House and within Carton Demesne.

**PS 8** Encourage high quality design in relation to planning applications that are made for the construction of extensions or new buildings affecting protected structures or older buildings of architectural merit not included in the RPS.

**PS 15** Require an Architectural Heritage Assessment Report, as described in Appendix B of the Architectural Heritage Protection, Guidelines for Planning Authorities, DAHG (2011), to accompany all applications involving a protected structure.

**PS 16** Protect and retain important elements of the built heritage including historic gardens, stone walls, landscapes and demesnes, and curtilage features.

**PS 18** Require where appropriate that a Conservation Plan is prepared in accordance with DAHG Guidelines and conservation best practice to inform proposed visual or physical impacts on a Protected Structure, its curtilage, demesne and setting.

**PS 19** Have regard where appropriate to DAHG Guidelines and conservation best practice in assessing the significance and conservation of a Protected Structure, its curtilage, demesne and setting.

**PS 20** Have regard where appropriate to DAHG Guidelines and conservation best practice in assessing the impact of development on a Protected Structure, its curtilage, demesne and setting.

Objectives: Protected Structures

It is an objective of the Council to:

**PSO 1** Review and amend on an ongoing basis the Record of Protected Structures and make additions, deletions and corrections as appropriate over the period of this Plan.

**PSO 3** Prepare a Local Area Plan for Celbridge (including Castletown Demesne) in conjunction with relevant bodies to protect the views as outlined in objective PSO 4 and Map 12.13.

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28 NOV 2022

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**PSO 4** Protect the views at Castletown House

- Axial views between the Castletown House and Conolly's Folly;
- Views between Castletown House and the Wonderful Barn;
- Views from the House to the river and across the back parterre;
- Views across the river and to the linked demesnes of Donaghcumper and St. Wolstans;
- Views from the main avenue to the river towards Castletown, and up and down the river to Celbridge and New Bridges.

**PSO 5** Preserve the views to and from Carton House within the Demesne walls, as outlined in Map 12.12.

**PSO 7** Safeguard the amenities of Castletown House including the main avenue, Donaghcumper, St Wolstans and the River Liffey environs as shown on Map 12.13.

**Objectives: Architectural Conservation**

**ACO 2** Co-operate with Waterways Ireland in the management, maintenance and enhancement of the Royal Canal and Grand Canal and associated structures/features.

**ACO 3** Carry out an audit of all historic rail and road bridges and disused railway lines in Kildare and liaise with Iarnród Éireann and the Transport Infrastructure Ireland regarding same.

**Policies: Country Houses and Demesnes**

In relation to country houses and their demesnes, section 12.5 of the development plan includes the following relevant policies:

**CH1** To promote appreciation of the landscape and historical importance of traditional and historic gardens, demesnes and parks within Kildare in general and particularly where they constitute an important setting to a protected structure.

**CH 2** To preserve and protect the historic gardens and designed landscapes identified in the National Inventory of Architectural Heritage.

**CH 6** Designate Architectural Conservation Areas where considered appropriate, to preserve the character of a designed landscape.

**CH 8** Require where appropriate that a Conservation Plan is prepared in accordance with DAHG Guidelines and conservation best practice to inform proposed visual or physical impacts on a demesne, designed landscape or a park.

**CH 9** Require that planning applications take into consideration the impacts of the development on their landscapes and demonstrate that the development proposal has been designed to take account of the heritage resource of the landscape.

**14.1.2.3 Leixlip Local Area Plan**

The area covered in the Leixlip Local Area Plan 2017-2023 extends as far as the present application site, ending at Kellystown Lane. The boundary includes land on the northern side of the Rye Water.

The local area plan has a number of policies and objectives relating to built heritage, including the following:

**Policy BH1**

**BH1** It is the policy of the Council to preserve and enhance the buildings identified on the Record of Protected Structures and to carefully consider any proposals for development that would affect the special value of such structures, including its historic curtilage, both directly and indirectly.

## Objectives

It is an objective of the Council:

**BHO1.1** To ensure the protection of all structures, (or parts of structures) and the immediate surroundings including the curtilage and attendant grounds of structures contained in the Record of Protected Structures (refer to Table 10.1 and the Built Heritage and Archaeology Map in Appendix A).

**BHO1.3** To protect the landscape character, values, sensitivities, focal points and views in the Leixlip Plan Area, including those identified in the Kildare County Development Plan. This will include, inter alia, the following:

- the requirement of a Visual Impact Assessment for developments with potential to impact on areas of significant landscape character, value or sensitivity, including both urban and natural features, significant townscapes and historic buildings, as appropriate.
- Prohibit development that will block or interfere with a significant focal point or view. Where it is considered that a development may impact on focal points or views, have regard to the significance of any such impact and any appropriate mitigation measures that should be incorporated.

**BHO1.7** To complete a Conservation Study for The Wonderful Barn and its curtilage to inform potential feasibility studies and public consultation for appropriate use, and to support the implementation of the conservation plan for the restoration and management of The Wonderful Barn and associated lands in association with key stakeholders.

### 14.1.2.4 Conservation Charter Context

#### International Conservation Guidance Context:

The international conservation policy context is enshrined in the large body of conservation charters and associated conventions, documents, etc.

The primary charters which have guided the approach to the proposed works are the *International Charter for the Conservation and Restoration of Monuments and Sites* (The Venice Charter, 1964) and the Australia *ICOMOS Charter for Places of Cultural Significance* (The Burra Charter, 1999).

These charters should be read as a whole, many of the articles being interdependent. However, there are some elements of these two charters which have greater relevance. These are set out below:

#### The Venice Charter:

**Article 7:** "A monument is inseparable from the history to which it bears witness and from the setting in which it occurs".

#### The Burra Charter:

**Article 1:** "Cultural Significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations. Cultural significance is embodied in the place itself, its fabric (fabric may define spaces and these may be important elements of the significance of the place), setting (setting means the area around a place, which may include the visual catchment), use, associations (associations mean the special connections that exist between people and a place) – and may include social or spiritual values and cultural responsibilities for a place), meaning (meanings denote what a place signifies, indicates, evokes or expresses and generally relate to intangible aspects such as symbolic qualities and memories), records, related places and related objects. Places may have a range of values for different individuals or groups. Cultural significance may change as a result of the continuing history of the place. Understanding of cultural significance may change as a result of new information"

28 NOV 2022

**Article 5:** *"Relative degrees of cultural significance may lead to different conservation actions at a place."*

**Article 6:** *"The policy for managing a place must be based on an understanding of its cultural significance. Understanding cultural significance comes from collecting and analysing information and precedes making decisions".*

**Article 15:** *"Change may be necessary to retain cultural significance, but is undesirable where it reduces cultural significance. The amount of change to a place should be guided by the cultural significance of the place and its appropriate interpretation".*

## 14.2 THE PROPOSED DEVELOPMENT

The development comprises the rerouting of a 110kV double circuit overhead line (OHL) that runs North/South across the east side of Intel's Leixlip campus. This diversion will navigate around the Eastern extremity of the campus. A full Project description can be found in Chapter 4 *Proposed Development* of this report.

## 14.3 THE RECEIVING ENVIRONMENT

The receiving environment is of mixed character. The surrounding landscape in the vicinity of the site is varied: The Intel campus is a modern industrial complex dating from 1989 on and with substantial buildings covering a large area.

There are other industrial or commercial uses in close proximity, including those on the southern side of the R148 directly opposite the southern side of the Intel Campus.

To the south and east of the application site the built-up area around Leixlip adjoins close to the Campus.

To the north, west and south-west the land is agricultural, with significant numbers of houses and other buildings scattered through the area, some in clusters.

Two substantial Heritage Areas occur to the west of the Campus and to the south of it, at a distance; these are the demesnes of Carton and Castletown and they are of high significance. Associated with these, though not within either demesne, are the Conolly Folly and the Wonderful Barn.

In addition, the RPS includes follies and gatehouses, religious building stock, and building stock associated with the canals and the railway. Of this latter group Louisa Bridge, Leixlip Bridge, Cope Bridge, Deey Bridge, the Toll House (Leixlip Bridge), Leixlip Spa and Aqueduct are particularly noteworthy.

The estate farm complex of Barnhall House, The Wonderful Barn and the pigeon towers at Barnhall, built in 1743, are very important built heritage assets in Leixlip.

The Rye Water Valley at the northern end of the subject lands is a Special Area of Conservation and is legally protected under the EU Habitats Directive (92/43/EEC).

The Royal Canal immediately to the east of the subject site, is designated as a pNHA (Site code: 002103) as noted under the Leixlip Local Area Plan

The subject lands are also close to a number of Protected Views as noted in the Kildare County Council – Leixlip Local Area Plan 2020-2023.

The LAP notes under Section 10.1.3 'Protected Views' that the Kildare County Development Plan includes views to be protected between The Wonderful Barn and Castletown House which affect

some lands within the LAP and goes on to state that 'the design and siting of new development shall have regard to protected views...'

### 14.3.1 HISTORICAL BACKGROUND

Little is known of the early settlement of the Leixlip area, though clearly the area was settled, the land being of good quality. Evidence for ancient settlement is poor, though the early medieval period is represented by a rath in the townland of Kilmacredock Lower, an ogham stone found in the grave yard at Donoghmore Church and an early-medieval burial ground found within the demesne of Carton House.

From the 11<sup>th</sup> century information relating to the area becomes more abundant and it is known that by that time the Scandinavian settlement of the Dublin area had spread to Leixlip. The name itself is Norse, meaning "salmon leap" – a reference to falls on the River Liffey. The Scandinavian presence would have encompassed more than salmon fishing or the development of the town and is likely also to have included the farming of the area and, probably, milling.

With the arrival of the Normans the Dublin area, including Leixlip, came under their control and within a short time lands throughout the area had been granted by the crown to various Norman barons. In 1171-2 Henry II granted the lands of Leixlip to Robert Fitz Stephen as part of a number of land grants in the Kildare area, though shortly after this the king gave overall control of the lands to Strongbow, earl of Pembroke. Strongbow reversed the grant of the lands of Leixlip and gave them to Adam de Hereford. De Hereford founded the borough of Leixlip and probably also erected the first castle, which is likely to have been an earthen motte. It is probable that he also erected at least one mill on the property, unless, as has been suggested above, there was already a mill.

The de Hereford family property passed by inheritance to the Pippard family and in 1302 Sir Ralph Pippard surrendered his manor at Leixlip to the king and this included the town, the castle and two mills. The king leased the manor to the Hospitallers of Kilmainham, whose headquarters were on the site later occupied by the Royal Hospital, now the Museum of Modern Art.

In the latter part of the fifteenth century a significant amount of land came into the hands of the Fitzgerald family, including the manors of Lucan and, in 1484, Leixlip. The Fitzgeralds came to own substantial lands, administered from their centre at Maynooth, while the manor of Leixlip became their second most important holding. Blakestown and Kellystown were part of the Manor of Maynooth, while the rest of the present Intel site was in the manor of Leixlip.

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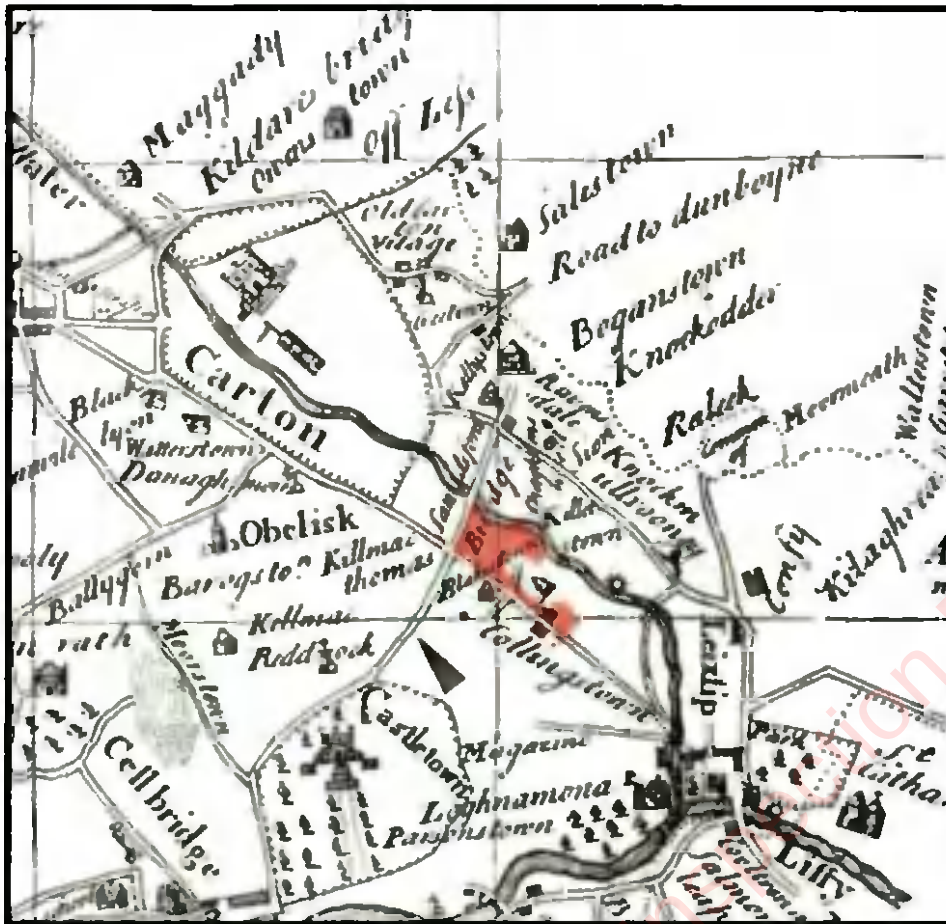


**Figure 14.1 Down Survey (Extract) 1655**

The Fitzgerald control over Leixlip lasted only about fifty years, however. With the Silken Thomas rebellion in 1536 Thomas Fitzgerald's kinsman, Sir James Fitzgerald, was implicated in the rebellion and his property was forfeit to the crown. His lands at Leixlip were granted to Sir John Alen, a cousin of Archbishop Alen who had been murdered in the rebellion. Sir John was a powerful figure in Irish politics at the time, becoming successively master of the rolls of chancery in 1533 and lord chancellor of Ireland in 1537. The Alen family interest in the Leixlip area lasted until 1570, when it was acquired by Sir Nicholas Whyte, master of the rolls.

The lands of Leixlip and part of Maynooth were recorded on the Down Survey map of County Kildare in 1655, as seen in the detail in Figure 14.1 above. This shows the Rye Water running towards the Liffey, with the townland names, amongst which are "Kellstown" (Kellystown) and "Collingsto" (Collinstown). Blakestown is not labelled on this map.

In 1728 the manor, town and lands of Leixlip were acquired by William Conolly, speaker of the House of Commons and the builder of Castletown House. Shortly after this Leixlip Castle was acquired by his nephew, Sir William Conolly. In 1739 the 19<sup>th</sup> earl of Kildare decided to rebuilt Carton House as his main residence, in place of Maynooth Castle.



**Figure 14.2 Noble and Keenan Map of Kildare (Extract) 1752**

The area was depicted on Noble and Keenan's map of County Kildare, which was published in 1752, a detail of which is reproduced in Figure 14.2 above. This shows Carton House with its demesne, and the Tyrconnell Tower (shown as a tower on the northern side of the river above the word "Carton"), Castletown House, the Wonderful Barn (depicted as an elongated triangle to the north-east of Castletown House) and the Conolly Folly (shown as a symbol and labelled "Obelisk" to the north of "Barogston"), as well as place names such as Blakestown, Collinstown, Kelly's Town, Kelletstown, Ravensdale and Sandsford Bridge. Precise information in relation to buildings is more difficult to interpret, other than the high-profile structures mentioned above. Sandsford's Bridge was clearly present as it is shown on the map and also labelled. However, it is more difficult to be certain whether the rectangle above the double L in "collinstown" shows the presence of Collinstown House, or whether this was a different building. Similarly, structures on the north-eastern side of the road are not always clear.

Hedsor and Blakestown House are not shown on the map.

It is unlikely that the structure north of the road above the name "Collinstown" relates to Music Hall; as the house appears to have been built at a later date. Ravensdale House is however clearly present, as is its avenue opposite Kellystown Lane, which is visible today as a field boundary and as crop marks in the fields to the south of the house.

Noble and Keenan's map shows that the principal elements of the landscape comprising roads, bridges, the large houses and demesnes were in place by the mid-eighteenth century.

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28 NOV 2022

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**Figure 14.3 John Roque Kildare Estate Map (Extract) 1757**

In 1757 Viscount Leinster, employed the Anglo-French Cartographer John Roque to survey his lands.

The map of the earl's lands at Maynooth includes Carton demesne and, to the east of it, Kellystown and Blakestown. The present application site is shown clearly, the fields indicated with brown stripes, indicating that they were in use as arable land. The Rye Water is seen running through the centre of the map extract above, with Sandfords Bridge carrying Kellystown Lane. In 1766 the earl was raised to the dukedom of Leinster.

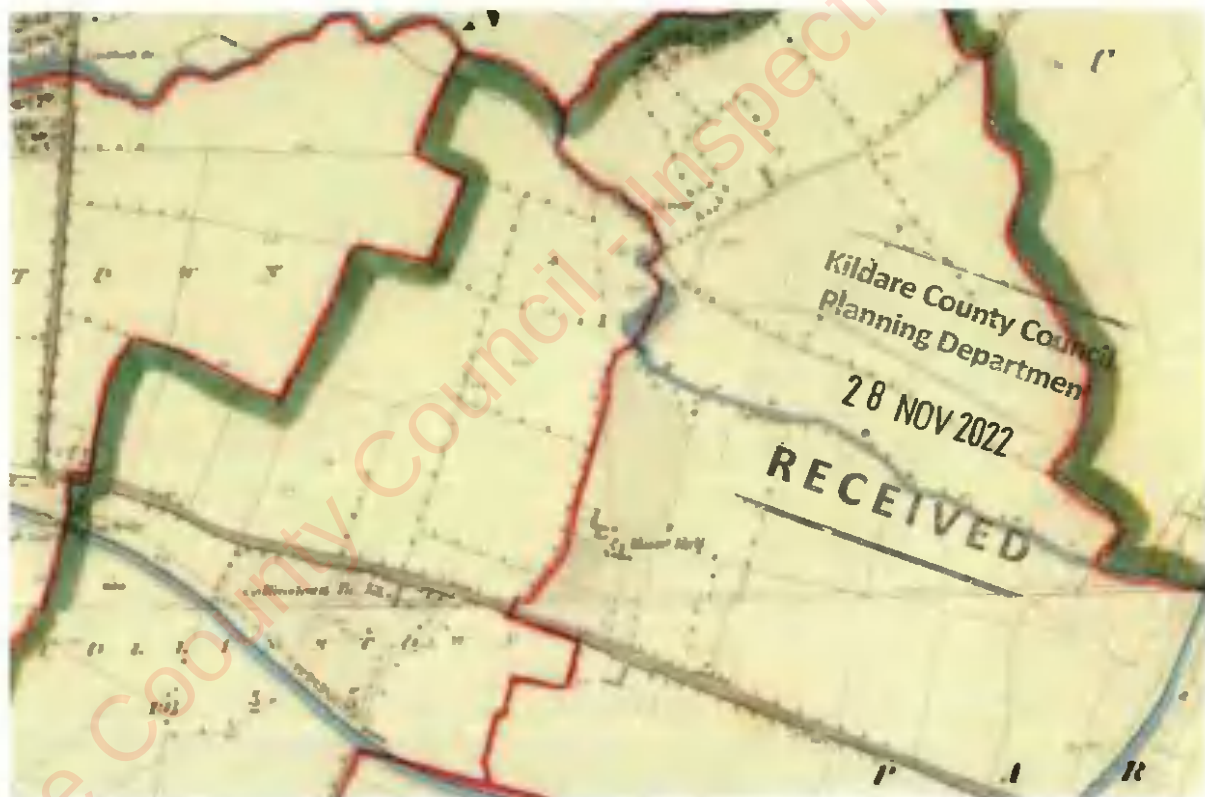


**Figure 14.4 Alexander Taylor Map of Kildare (Extract) 1783**

The map of County Kildare that was produced by Alexander Taylor in 1783 is more accurate than Noble and Keenan's. It also shows the new developments that had occurred in the thirty years since the earlier map had been produced. Hedsor had appeared, shown as a small rectangle on the northern side of the Maynooth Road below the word "Blakestown", while another small rectangle to the east of the junction of Kellystown Lane appears to be Blakestown House. To the east of this "Musichall" was depicted pictorially. On the southern side of the main road from this is a small rectangle that is clearly Collinstown House.

In 1790 work commenced on a canal to connect Dublin with the Shannon, running to the north of the city and through Maynooth and Mullingar to meet the Shannon at Termonbarry. It took sixteen years to complete the first section of the canal, between the terminus at Broadstone in Dublin and Mullingar, passing by Leixlip and running to the south of the Maynooth Road on its way westward. The canal company had to provide bridges wherever the canal crossed an existing road and one of these, on a local road leading south from the Maynooth Road at Collinstown, was built in 1795 and named Deey Bridge after one of the directors of the Royal Canal Company, Robert Deey, who was on the board of the company from 1794 to 1806.

John Taylor's map of The Environs of Dublin, published in 1816, includes the greater part of the Intel site at Leixlip at the western margin of the map, including Music Hall, but not Kellystown Lane. However, this part of the map cannot be taken as accurate, as it places the Royal Canal in the wrong location, running very close to Music Hall and crossing the Maynooth Road adjacent to Collinstown House.



**Figure 14.5 Ordnance Survey First Edition (Extract) 1838**

The first-edition Ordnance Survey six-inch map of the Leixlip area shown at Figure 14.5, was published in 1838 and depicts the landscape with a higher degree of accuracy. The shows a great deal more detail than had been shown in any published map prior to this and only the estate map reproduced in Figure 14.3 included anything like the same information.

This map shows the Royal Canal, with Deey Bridge and the adjacent lock. Hedsor, Collinstown House, Sandfor's Bridge and Music Hall are shown and labelled, while Blakestown House is also shown,

though not labelled, and a building is shown on the site of Nelson's Cottage. Further afield, though not shown on this extract, Ravensdale is shown, with its demesne, though this no longer extends to the road to the south and the avenue of trees to the south of the house is no longer present.

The green lines on the map depict the boundaries of civil parishes, with the greater part of the Intel site, with the lands in the south-eastern section of the map, within the parish of Leixlip, while Blakestown and Kellystown, in the north-western section of the map, are in the parish of Laraghbryan. This line also divided the former manors of Maynooth and Leixlip and hence denoted the land ownership, with Laraghbryan in the possession of the Duke of Leinster

The Ordnance Survey maps were produced to a level of accuracy and consistency that it is possible to identify changes that took place between one edition and the next. The second-edition Ordnance Survey six-inch map of this part of Kildare was published in 1870, just over thirty years after the first edition.



**Figure 14.6 Ordnance Survey (Extract) 1907**

In 1907 the Ordnance Survey published a map of the area at the larger scale of 1:2500, a detail of which is reproduced above. Comparison of this map with the 1870 edition shows that Blakestown House is larger and a different shape, suggesting that it had been rebuilt, while Collinstown House had been enlarged. The house known as Music Hall had been renamed Ryebrook.

#### **14.3.1.1 Built Heritage Survey**

The survey of built heritage includes protected structures. As previously noted, these comprise those protected structures listed on the Register of Protected Structures in the current Kildare Co. Council Development Plan 2017 – 2023 and those structures proposed for inclusion in the Draft Kildare Co. Council Development Plan 2023-2029.

It also includes relevant structures that are listed in the National Inventory of Architectural Heritage (NIAH) and which are in the vicinity of the application site. Other structures which are deemed to be

of architectural heritage interest, but which are neither protected structures nor listed in the NIAH are also included in the survey.

#### 14.3.1.2 Protected Structures under the Kildare County Development Plan 2017-2023

The following structures in the vicinity of the application site are included in the record of protected structures in the Kildare County Development Plan 2017-2023.



**Figure 14.7 Record of protected structures in the Kildare County Development Plan 2017-2023**

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**Table 14.1 Record of protected structures in the Kildare County Development Plan 2017-2023**

| Image Key | RPS No. | Structure name                                                                           | Townland                 | Description      |
|-----------|---------|------------------------------------------------------------------------------------------|--------------------------|------------------|
| 1         | B06-07  | Hedsor House                                                                             | Blakestown               | House            |
| 2         | B06-08  | Ravensdale House                                                                         | Ravensdale               | House            |
| 3         | B06-09  | Carton House and associated outhouses, stables and yards                                 | Carton Demesne           | House            |
| 4         | B06-09i | Interiors of Carton Demesne (House and Gardens)                                          | Carton Demesne           | House and Garden |
| 5         | B06-14  | Deey Bridge (and Lock)                                                                   | Blakestown (Maynooth ED) | Bridge           |
| 6         | B11-13  | Castletown House, Temple, Batty Langley Lodge, Entrance Gates and avenue (and interiors) | Castletown               | House            |
| 7         | B11-15  | Wonderful Barn Complex                                                                   | Barnhall                 | Barn             |
| 8         | B11-16  | Conolly Folly                                                                            | Barrogstown West         | Obelisk          |
| 9         | B11-117 | Collinstown House                                                                        | Collinstown              | House            |

**14.3.1.3 Proposed Protected Structures under the Draft Kildare County Development Plan 2023 – 2029**

The following structures in the vicinity of the application site are proposed additions to the record of protected structures in the Kildare County Development Plan 2023 - 2029.



**Figure 14.8 Proposed Protected Structures under Draft Kildare County Development Plan 2023 – 2029**

**Table 14.2 Proposed Protected Structures under the Draft Kildare County Development Plan 2023 – 2029**

| Image Key | RPS No. | Structure name     | Townland                | Description            |
|-----------|---------|--------------------|-------------------------|------------------------|
| 1         | PPS-06  | Louisa's Bridge    | Leixlip                 | Canal Bridge           |
| 2         | PPS-03  | Station House      | Leixlip                 | Former railway Station |
| 3         | PPS-07  | Hexagonal Well     | Leixlip                 | Well                   |
| 4         | PPS-08  | Romanesque Bath    | Leixlip                 | Folly                  |
| 5         | PPS-09  | Rye Water Aquaduct | Confey / Leixlip        | Bridge                 |
| 6         | PPS-10  | Collector's House  | Confey                  | House                  |
| 7         | PPS-19  | Sandsford Bridge   | Blakestown / Kellystown | Bridge                 |
| 8         | PPS-20  | Cope Bridge        | Newtown                 | Bridge                 |
| 9         | PPS-21  | Hillford House     | Leixlip                 | House                  |

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#### 14.3.1.4 Structures listed under the NIAH for County Kildare

The following structures in the vicinity of the application site are included in the NIAH record of Heritage Structures.



Figure 14.9 Structures listed under the NIAH for County Kildare

Table 14.3 Structures listed under the NIAH for County Kildare

| Image Key | Reg No.  | Structure name                        | Rating   | Description                      |
|-----------|----------|---------------------------------------|----------|----------------------------------|
| 1         | 11804033 | Catholic Church of Our Ladys Nativity | Regional | Church / Chapel                  |
| 2         | 11804075 | Newtown Hill House                    | Regional | House                            |
| 3         | 11900601 | Pike Bridge                           | Regional | Bridge                           |
| 4         | 11900602 | Deey Bridge                           | Regional | Bridge                           |
| 5         | 11901101 | Leixlip Gate                          | Regional | Demesne Walls / Gates / Railings |
| 6         | 11901102 | Wonderful Barn                        | National | Folly                            |

#### 14.3.1.5 Non-Protected Structures deemed to be of Heritage Importance

The following structures in the vicinity of the application site are Non-Protected Structures but are deemed to be of Heritage Importance



**Figure 14.10 Non Protected Structures deemed to be of Heritage Importance Heritage Structures**

**Table 14.4 Non-Protected Structures deemed to be of Heritage Importance Heritage Structures**

| Image Key | Structure name        | Townland                            | Description |
|-----------|-----------------------|-------------------------------------|-------------|
| 1         | Royal Canal           | Blakestown, Collinstown and Leixlip | Canal       |
| 2         | Lock-Keeper's cottage | Collinstown                         | House       |
| 3         | Blakestown House      | Blakestown                          | House       |
| 4         | Nelson's Cottage      | Leixlip                             | House       |

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## 14.4 HERITAGE IMPACT ASSESSMENTS

### 14.4.1 PROTECTED STRUCTURES UNDER THE KILDARE COUNTY DEVELOPMENT PLAN 2017-2023

#### 14.4.1.1 Hedsor House



Hedsor is a mid-eighteenth-century house, built as a residence for the steward on the Carton Estate. The house is five-bay and two-storey and is faced with limestone rubble. The roof is U-shaped in plan, with the eastern side being hipped, while the western side projects over a return and is gabled.

There is a farm-yard to the rear of the house with a number of outbuildings. Beyond the farmyard to the rear and to either side there are fields.

|                                              |                                   |
|----------------------------------------------|-----------------------------------|
| <b>Date of Construction:</b>                 | Mid-eighteenth century            |
| <b>Protected Structure Record Reference:</b> | B06-07                            |
| <b>Special Interest:</b>                     | Architectural, historical, social |
| <b>Special Interest Rating:</b>              | Regional                          |
| <b>Distance from Application Site:</b>       | Greater than 1500 metres          |
| <b>Direct Impact:</b>                        | None                              |
| <b>Impact on Setting:</b>                    | Positive impact                   |
| <b>Mitigation:</b>                           | None                              |

Hedsor is too far from the application site for there to be any direct impact. The main elevation of the house faces the road to the south, while the rear elevation faces the farmyard to the rear, north of the house and not in line with the application site. The setting of the house is the road to the front, the farmyard and the fields on either side, with trees lining the road to the east and west.

The proposed Works will slightly improve this setting in relocating the overhead lines and tower structures further to the east.

#### 14.4.1.2 Ravensdale House



Ravensdale is a large detached house in the townland of Ravensdale. The house is not visible from the public road, from which it is separated by a distance of 550 metres.

The appearance of the house suggests a late-nineteenth century date. However, there has been a house on this site since at least as early as 1752, when it was marked on Noble and Keenan's map.

At that time the house had substantial planting in its demesne, much of which had gone by the time of the first Ordnance Survey map in the 1830s.

|                                              |                                                   |
|----------------------------------------------|---------------------------------------------------|
| <b>Date of Construction:</b>                 | Early-eighteenth century, largely rebuilt c. 1880 |
| <b>Protected Structure Record Reference:</b> | B06-08                                            |
| <b>Special interest:</b>                     | Architectural, historical, social                 |
| <b>Special interest Rating:</b>              | Regional                                          |
| <b>Distance from Application Site:</b>       | Greater than 1800 metres                          |
| <b>Direct Impact:</b>                        | None                                              |
| <b>Impact on Setting:</b>                    | Positive impact                                   |
| <b>Mitigation:</b>                           | None                                              |

Ravensdale is at a considerable distance from the application site, and is of 'four square' composition with primary fenestration on elevations facing east, west, north and south. The southern side of the house faces across fields for a distance of 550 m to the Confey Road, which is lined with trees.

The house itself is at a distance of approximately 1850 m from the proposed works at their nearest point.

There would be no direct impact on the house or its lands arising from the proposed development due to the distance of the house from the application site and the degree of screening.

The proposed works will re-align the overhead lines and tower structures somewhat further to the east than at present relative to the position of Ravensdale. The proposed works will therefore slightly improve this setting in relocating the overhead lines and tower structures further to the east.

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#### 14.4.1.3 Carton House



Carton House and surrounding demesne was the ancestral seat of the Earls of Kildare and Dukes of Leinster.

The estate first came into the ownership of the FitzGerald family c.1170 shortly after Maurice FitzGerald, Lord of Lanstephan (c. 1105-1176), was appointed Lord of Maynooth, an area covering townlands which include Carton.

The first record of a house at Carton was in the early seventeenth-century when William Talbot, Recorder of Dublin, was given a lease of the lands by the 14th Earl of Kildare (d. February 1612) and is thought to have built a house. The house and lands were forfeited to the Crown in 1691 and in 1703 sold to Major-General Richard Ingoldsby, Master General of the Ordnance.

In 1739 the lease was sold back to the 19th Earl of Kildare, who employed Richard Cassels (1690-1751) to design the existing house. Cassels was also responsible for Kildare House (later renamed Leinster House) in Dublin, which he also built, in 1745, for the FitzGerald.

Lady Emily Lennox, daughter of the 2nd Duke of Richmond and great-granddaughter of King Charles II married into the family in 1747 and played an important role in the development of the house and estate as it is today. She created the Chinese Room and decorated the Shell Cottage on the property with shells from around the world and re-ordered the landscaping with the removal of the straight avenues and created a more natural parkland to surround their house.

Carton remained unaltered until 1815, when the 3rd Duke decided to sell Leinster House to the R.D.S. and make Carton his principle residence. He employed Richard Morrison to enlarge and re-model the house. Morrison replaced the curved colonnades with straight connecting links to obtain additional rooms including the Dining Room. At this time the entrance to the house was moved to the north side.

Carton remained in the control of the FitzGerald until the early twentieth-century. It is now an Hotel and Golf Course.

|                                              |                                                                                                                                                           |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Date of Construction:</b>                 | Carton House: mid-eighteenth century, as enlargement of early seventeenth-century house<br>Tyrconnell Tower: late-seventeenth- and mid-eighteenth century |
| <b>Protected Structure Record Reference:</b> | B06-09                                                                                                                                                    |
| <b>Special interest:</b>                     | Architectural, artistic, historical, social                                                                                                               |
| <b>Special interest Rating:</b>              | National                                                                                                                                                  |
| <b>Distance from Application Site:</b>       | House: 4 kilometres; Carton Demesne townland 2 kilometres;<br>Tyrconnell Tower 3.2 kilometres                                                             |
| <b>Direct Impact:</b>                        | None                                                                                                                                                      |
| <b>Impact on Setting:</b>                    | Positive impact                                                                                                                                           |
| <b>Mitigation:</b>                           | None                                                                                                                                                      |

The house itself is at a distance of approximately 4,000 m from the proposed works at their nearest point.

There would be no direct impact on the house or its lands arising from the proposed development due to the distance of the house from the application site and the degree of screening.

The proposed works will re-align the overhead lines and tower structures somewhat further to the east than at present relative to the position of Carton and will therefore slightly improve this setting in relocating the overhead lines and tower structures further to the east.

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#### 14.4.1.4 Carton Demesne



Carton stands in a substantial demesne – the part that is within the townland of Carton Demesne measures some 390 hectares, while other parts of the original demesne lie in adjacent townlands.

The demesne is surrounded by a five mile long wall and there are five lodge houses dotted along the boundary. On the demesne itself is the Shell Cottage which once had a thatched roof and which is decorated outside and within with seashells and was built for Lady Emily FitzGerald.

A prominent feature within the demesne is Tyrconnell Tower, a four-storey folly set on high ground which was supposedly originally built by Richard Talbot, 1st Earl of Tyrconnell, and intended for his mausoleum. Its official name is The Prospect Tower.

The demesne is now laid out as a golf course, while some of the demesne has been developed for housing.

|                                              |                                                                                                                                                                             |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Date of Construction:</b>                 | Carton House Demesne: mid-eighteenth century.<br>Tyrconnell Tower: late-seventeenth- and mid-eighteenth century.<br>Shell cottage and lodge houses: mid-eighteenth century. |
| <b>Protected Structure Record Reference:</b> | B06-09i                                                                                                                                                                     |
| <b>Special interest:</b>                     | Architectural, artistic, historical, social                                                                                                                                 |
| <b>Special interest Rating:</b>              | National                                                                                                                                                                    |
| <b>Distance from Application Site:</b>       | Carton Demesne townland 2 kilometres;<br>Tyrconnell Tower 3.2 kilometres                                                                                                    |
| <b>Direct Impact:</b>                        | None                                                                                                                                                                        |
| <b>Impact on Setting:</b>                    | Positive impact                                                                                                                                                             |
| <b>Mitigation:</b>                           | None                                                                                                                                                                        |

There would be no direct impact on the Demesne arising from the proposed development due to the distance of the Estate from the application site and the degree of screening.

The proposed works will re-align the overhead lines and tower structures somewhat further to the east than at present relative to the position of Carton and will therefore slightly improve this setting in relocating the overhead lines and tower structures further to the east.

#### 14.4.1.5 Deey Bridge



The construction of the section of the Royal Canal between Broadstone, in Dublin, and Mullingar, took place between 1790 and 1806, to the designs of engineer Richard Evans, until his death in 1802.

Deey Bridge, named for Robert Deey, a member of the board of the Royal Canal Company, was built in 1795 and bears this date on either side of both parapets. It is likely that the adjacent lock was built at around the same time. Both are constructed with limestone, some of it rubble and other parts of cut stone. Both the bridge and the lock are built to a generic design, replicated in many places along the canal route. The chief variations between the various bridges on the canal would be the rise and the width. The rise is determined by the level of the canal as the bridge needs to rise to a sufficient headroom for horses and pedestrians to pass beneath the bridge on the towpath; in this instance the canal is in a cutting and well below road level, such that there is very little hump in the road as it crosses the bridge. The width of the bridge between the parapets is determined by the width of the road that approaches and crosses over.

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| <b>Date of Construction:</b>                 | 1795                                         |
| <b>Protected Structure Record Reference:</b> | B06-14                                       |
| <b>Special interest:</b>                     | Architectural, historical, social, technical |
| <b>Special interest Rating:</b>              | Regional                                     |
| <b>Distance from Application Site:</b>       | 70 metres                                    |
| <b>Direct Impact:</b>                        | None                                         |
| <b>Impact on Setting:</b>                    | Neutral impact                               |
| <b>Mitigation:</b>                           | None                                         |

Deey Bridge and the 13<sup>th</sup> Lock are mainly visible at the level of the canal and the canal towpath, though they are also visible from the road that crosses over the bridge.

There are no significant views of the bridge or the canal lock from any other public place. There is tree cover between the bridge and lock and the nearby R148 (Maynooth Road), beyond which the application site extends beyond the eastern fringes of the Intel Campus.

The proposed relocation of the overhead lines along the southerly boundary of the Intel campus heading east, will be marginally visible from the bridge, though this view will be largely interrupted by trees.

We would regard the likely impact of the diversion of overhead lines and the construction of the new tower structures along the southern boundary of the Intel campus as essentially having a neutral impact upon the setting of the bridge and lock.

#### 14.4.1.6 Castletown House, Temple, Batty Langley Lodge, Entrance Gates and avenue (and interiors)



Castletown House was built in the early 1720s for Thomas Conolly, speaker of the House of Commons and significant alterations were carried out in the 1750s and 1760s. The house is Palladian, with a central thirteen-bay, three-storey over basement block flanked by two-storey, seven-bay pavilions, to which it is attached by curved colonnades. The house was set in substantial parkland, the western part of which is adjacent to the town of Celbridge and has been developed for housing.

The demesne at Castletown was laid out with a radiating pattern of avenues, one of which, orientated towards the north-west, in line with the garden front, is directed towards the Conolly Folly, which is described below. An avenue leading at an angle to the axis of the house towards the north-north-east provided an access towards Leixlip and on this avenue a pair of cut-stone gate piers mark the Leixlip Gate and these are seen in the photograph above. This avenue was cut by the Royal Canal in the 1790s and originally led to the Maynooth Road opposite the application site at Collinstown. The avenue has more recently been cut by the M4 motorway. The avenue is still tree-lined, and the avenue of trees still extends northwards, now cut by a widened local road and by the access from the M4 motorway.

|                                              |                                             |
|----------------------------------------------|---------------------------------------------|
| <b>Date of Construction:</b>                 | 1720s and 1750s-60s                         |
| <b>Protected Structure Record Reference:</b> | B11-13 and 14                               |
| <b>Special interest:</b>                     | Architectural, artistic, historical, social |
| <b>Special interest Rating:</b>              | National                                    |
| <b>Distance from Application Site:</b>       | 2.6 kilometres                              |
| <b>Direct Impact:</b>                        | None                                        |
| <b>Impact on Setting:</b>                    | None                                        |
| <b>Mitigation:</b>                           | None                                        |

The entrance front at Castletown is orientated towards the south-east and the garden front to the north-west. These views are not oriented towards the application site. The windows at the end of the

house face towards a dense belt of trees in close proximity to the house and there is no possibility of a view of the proposed OHL diversion from Castletown House.

The demesne is at a sufficient distance from the development works to relocate the overhead lines and with significant numbers of trees in the intervening landscape, that the proposed OHL diversion and associated new tower structures will not be seen from the demesne of Castletown.

The avenue leading to the Leixlip Gate has trees planted closely together on either side and this planting leads all the way up to the present end of the avenue and its associated road adjacent to the Royal Canal.

There is no public access to the remnants of this avenue near to its northern end.

The tree cover also ensures that the Leixlip Gate and the formal part of the avenue will not have a view of the proposed OHL diversion.

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#### 14.4.1.7 Wonderful Barn Complex



The Wonderful Barn stands amongst a group of buildings surrounded by fields and allotments on a site to the south-south-east of the present application site. The building was erected as a grain store as part of a famine relief effort undertaken by Katherine Conolly of Castletown House, widow of its builder, William Conolly.

In 1741 in the course of an intense and prolonged winter, in which the temperature remained below freezing for seven weeks, the ground froze, and crops were destroyed, including much of the previous year's potato crop that was stored in the ground.

The erection of the barn provided employment and hence income for those in the locality who were suffering, and it also provided a store for food that might offset later shortages. The barn is conical, with an external staircase to allow for loading from the top.

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| <b>Date of Construction:</b>                 | 1740s                                        |
| <b>Protected Structure Record Reference:</b> | B11-15                                       |
| <b>Special interest:</b>                     | Architectural, historical, social, technical |
| <b>Special interest Rating:</b>              | National                                     |
| <b>Distance from Application Site:</b>       | 1.5 kilometres                               |
| <b>Direct Impact:</b>                        | None                                         |
| <b>Impact on Setting:</b>                    | None                                         |
| <b>Mitigation:</b>                           | None                                         |

The Wonderful Barn is at a distance from the route of the overhead line diversion and new tower structures proposed, which cannot be seen from the land in the vicinity of the barn.

There would be no impact on the setting of the barn at ground level as a consequence of these works.

From the top of the stairs leading up the side of the barn there is a view over a wide expanse in all directions, including a view of the application site. However, this is at a distance of 1.5

kilometres, and the Barn is separated from the application site and proposed development works by urban and suburban housing, industry, roads and other uses.

As a result, the provision of the new works will be in line with existing trends and the resulting visual impact would be nil.

#### 14.4.1.8 The Connolly Folly



The Connolly Folly was built in the early 1740s by Katherine Connolly as part of the relief works arising from the great freeze that occurred at that time.

The folly is monumental in scale, rising approximately 43 metres, a height that is accentuated by the relatively flat landscape in which it stands.

The structure was built on part of the Carton estate and not Mrs Connolly's own land at Castletown.

The structure consists of a series of arches of differing sizes, five at the lower level and three at the upper level and these support an obelisk that is equal in height to the structure below.

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|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| <b>Date of Construction:</b>                 | 1740s                                        |
| <b>Protected Structure Record Reference:</b> | B11-16                                       |
| <b>Special interest:</b>                     | Architectural, historical, social, technical |
| <b>Special interest Rating:</b>              | National                                     |
| <b>Distance from Application Site:</b>       | 3.1 kilometres                               |
| <b>Direct Impact:</b>                        | None                                         |
| <b>Impact on Setting:</b>                    | None                                         |
| <b>Mitigation:</b>                           | None                                         |

The folly is orientated towards Castletown House, to the south-east and it remains visible from that house.

The vista towards the application site is not one of significance. The folly is in the midst of a grove of trees such that from ground level the only views are towards the north-west and south-east, while the views towards the application site are blocked.

It may be possible in the future to climb to the upper of the arched levels, however, given the built and natural topography intervening between the folly and the subject development as well as the

distance to the proposed works, the proposed development works are unlikely to be visible from there.

#### 14.4.1.9 Collinstown House



Collinstown House appears to date from the mid-eighteenth century, or it is on the site of a building of that period. It is a five-bay, two-storey house with a single-storey annex added onto the eastern end. The house faces south and stands close to the R148. At the rear of the house there is a high wall on the road margin and this largely conceals the house.

To the east of the house there is a two-storey range of outbuildings and these back on to a modern access road leading to industrial land.

Collinstown House and its outbuildings are currently derelict.

The National Inventory of Architectural Heritage included Collinstown House in its garden survey. This was a desktop survey based on historic maps and aerial photographs, without a visit to the site. The examination of the grounds of Collinstown House concluded *"main features unrecognisable – peripheral features visible"*.

|                                              |                       |
|----------------------------------------------|-----------------------|
| <b>Date of Construction:</b>                 | 1740s                 |
| <b>Protected Structure Record Reference:</b> | B11-117               |
| <b>Special interest:</b>                     | Architectural, social |
| <b>Special interest Rating:</b>              | National              |
| <b>Distance from Application Site:</b>       | 500 metres            |
| <b>Direct Impact:</b>                        | None                  |
| <b>Impact on Setting:</b>                    | None                  |
| <b>Mitigation:</b>                           | None                  |

Collinstown House faces away from the application site, towards the south. The rear of the building looks directly a high wall, which screens the house from the view across the road and would obstruct any view of the site from the rear windows.

The view to the proposed development works would be obscured by the presence of the existing boundary walling to Collinstown House and also by the development comprising the Intel Campus itself

The proposed works would have no impact on the setting of or views from Collinstown House

## 14.4.2 PROPOSED PROTECTED STRUCTURES UNDER THE DRAFT KILDARE COUNTY DEVELOPMENT PLAN 2023 – 2029

The proposed 2023 – 2029 Kildare County Development Plan contains a number of proposed additions to the record of protected structures as noted at 1.3.2.2.

### 14.4.2.1 Louisa Bridge



The construction of the section of the Royal Canal between Broadstone, in Dublin, and Mullingar, took place between 1790 and 1806, to the designs of engineer Richard Evans, until his death in 1802.

Louisa Bridge (named for Lady Louisa Connolly of Castletown House in Celbridge. Lady Louisa was the younger sister of Lady Emily Fitzgerald, Duchess of Leinster who was the mother of the 2nd Duke of Leinster; Lord Edward Fitzgerald), was built as a part of the Royal Canal development in 1794 as noted on a partially obscured inset stone at road level.

It is built of limestone, partly in coursed rubble and other parts of cut stone and is built to a generic design, replicated in many places along the canal route (including a the nearby Deey Bridge).

The chief variations between the various bridges on the canal are the rise and the width. The rise is determined by the level of the canal as the bridge needs to rise to a sufficient headroom for horses and pedestrians to pass beneath the bridge on the towpath; in this instance the canal is in a cutting and well below road level, such that there is very little hump in the road as it crosses the bridge. The width of the bridge between the parapets is determined by the width of the road that approaches and crosses over.

The hump of the bridge is further obscured by alterations carried out to the gradient of the road which has resulted in the road surface rising above that originally envisaged. It also appears that the eastern portion of the bridge has been altered at ramp level to facilitate the development of the adjacent railway line and station.

|                                              |                                              |
|----------------------------------------------|----------------------------------------------|
| <b>Date of Construction:</b>                 | 1794                                         |
| <b>Protected Structure Record Reference:</b> | PPS-06                                       |
| <b>Special interest:</b>                     | Architectural, historical, social, technical |
| <b>Special interest Rating:</b>              | Regional                                     |
| <b>Distance from Application Site:</b>       | 100 metres                                   |
| <b>Direct Impact:</b>                        | Negative                                     |
| <b>Impact on Setting:</b>                    | Negative impact                              |
| <b>Mitigation:</b>                           | None                                         |

Louisa Bridge is mainly visible at the level of the canal and its towpath, and is also visible from the road that crosses over the bridge.

The proposed relocation of the overhead lines along the southern and eastern boundary of the Intel campus heading north, will be visible from the bridge, though this view will be partially interrupted by trees.

We would regard the likely impact of the overhead lines and the construction of the tower structures along the southern and eastern boundary of the Intel campus having a negative impact upon the setting of the bridge and towpath.

#### 14.4.2.2 Station House



The Dublin to Maynooth Rail Line which runs east west along the southern side of and parallel to the Royal Canal, opened in 1848. The Station House, built as a part of these works served the civil parish of Leixlip and opened on 1 September 1848 the station was known simply as Leixlip from 1851 until the opening of Leixlip Confey railway station in 1990.

In the early 2000s the station house became a dwelling house separated from the railway station which was at that date re-developed.

The Station House appears to be of masonry construction, finished in Roman Cement or similar hard cementitious material, and incorporates a series of three arched openings with later fenestration facing towards the canal. It incorporates a flat roof and a single active chimney stack.

|                                              |                                  |
|----------------------------------------------|----------------------------------|
| <b>Date of Construction:</b>                 | 1851                             |
| <b>Protected Structure Record Reference:</b> | PPS-03                           |
| <b>Special interest:</b>                     | Architectural, social, technical |
| <b>Special interest Rating:</b>              | Regional                         |
| <b>Distance from Application Site:</b>       | 100 metres                       |
| <b>Direct Impact:</b>                        | None                             |
| <b>Impact on Setting:</b>                    | Negative impact                  |
| <b>Mitigation:</b>                           | None                             |

The Station House is partly visible at the level of the canal and its towpath opposite, it is not visible from the road that crosses over the bridge.

Generally, views to the Station House are largely obscured by alterations carried out to the surrounding railway station infrastructure

The proposed relocation of the overhead lines along the southern and eastern boundary of the Intel campus heading north, will be visible from the Station House west facing windows, though this view will be partly interrupted by the ramp structure located to its west serving the railway station and will also be partially interrupted by trees to the west.

We would regard the likely impact of the overhead lines and the construction of the tower structures along the southern and eastern boundary of the Intel campus having a negative impact upon the setting of the Station House.

#### 14.4.2.3 Hexagonal Well



The Spa Spring was unearthed by workmen digging the Royal Canal in 1793 and the company decided to route the warm spring to a shallow hexagonal shaped pond, and from here it flowed down the side of the valley to a Romanesque bath.

The spa waters bubble from the ground at a constant 23.9 degrees Celsius (75 degrees F) and drain into the Rye River below.

The Hexagonal Well and its adjacent wall structure and outflows are of cut limestone construction finely jointed but notwithstanding recent consolidation works is in poor state of repair.

|                                              |                                                   |
|----------------------------------------------|---------------------------------------------------|
| <b>Date of Construction:</b>                 | 1794                                              |
| <b>Protected Structure Record Reference:</b> | PPS-07                                            |
| <b>Special interest:</b>                     | Architectural, historical, social, archaeological |
| <b>Special interest Rating:</b>              | Regional                                          |
| <b>Distance from Application Site:</b>       | 50 metres                                         |
| <b>Direct Impact:</b>                        | Negative impact (Minor)                           |
| <b>Impact on Setting:</b>                    | Negative impact (Minor)                           |
| <b>Mitigation:</b>                           | None                                              |

The Hexagonal Well is not fully visible from the canal and its towpath or the road that crosses over the bridge.

The proposed relocation of the overhead lines along the eastern boundary of the Intel campus heading north, will be partly visible from the Hexagonal Well though this view will be largely interrupted by trees.

We would regard the likely impact of the overhead lines and the construction of the tower structures along the eastern boundary of the Intel campus having a minor negative impact directly and upon the setting of the Hexagonal Well.

#### 14.4.2.4 Romanesque Bath



As noted above, the Spa Spring was unearthed by workmen digging the Royal Canal in 1793 and the Royal Canal Company, at the behest of William Connolly of Leixlip Castle, motivated by the success of the spring at Lucan which was discovered in 1758, diverted the spring water into a brick basin alongside the banks of the Rye Water and commissioned the construction of a Roman style outdoor bath.

The dressings and steps to the bath are of finely jointed cut limestone construction with a surrounding 'Chinoiserie'

pathway border in randomised 'Sharawadgi' (Chinese Cracked Ice) pattern and its internal wall structure are of brick.

The Baths were restored in 2010 however they are at the present date in a poor state of repair due to weathering and anti social activity.

|                                              |                                   |
|----------------------------------------------|-----------------------------------|
| <b>Date of Construction:</b>                 | 1794                              |
| <b>Protected Structure Record Reference:</b> | PPS-08                            |
| <b>Special interest:</b>                     | Architectural, historical, social |
| <b>Special Interest Rating:</b>              | Regional                          |
| <b>Distance from Application Site:</b>       | 50 metres                         |
| <b>Direct Impact:</b>                        | Negative impact                   |
| <b>Impact on Setting:</b>                    | Negative impact                   |
| <b>Mitigation:</b>                           | None                              |

The Romanesque Bath is partly visible from the towpath, it is not visible from the road that crosses over the bridge.

The proposed relocation of the overhead lines along the eastern boundary of the Intel campus heading north, will be visible from the Romanesque bath though this view will be partially interrupted by trees.

We would regard the likely impact of the overhead lines and the construction of the tower structures along the eastern boundary of the Intel campus having a negative impact directly and upon the setting of the Romanesque bath.

#### 14.4.2.5 Rye Water Aqueduct



The waters from the Spa flow into Rye River which then flows under the Royal Canal, which is carried in the Leixlip aqueduct almost 100 feet (30m) above.

The aqueduct is an impressive feat of engineering and is constructed as an earth embankment, faced in cut coursed limestone and took six years to build in the 1790s.

The aqueduct was designed by Richard Evans who was appointed as the engineer for the Royal Canal in 1793 and remained in the post until his death in 1802. Evans along with company surveyor John

Brownrigg would have overseen the construction of the aqueduct which was beset with problems and poor weather. The foundations of the aqueduct collapsed twice during construction as the mortar would not set and ultimately cost over £27,000 to finish.

|                                              |                       |
|----------------------------------------------|-----------------------|
| <b>Date of Construction:</b>                 | 1794                  |
| <b>Protected Structure Record Reference:</b> | PPS-10                |
| <b>Special interest:</b>                     | Architectural, social |
| <b>Special Interest Rating:</b>              | Regional              |
| <b>Distance from Application Site:</b>       | 150 metres            |
| <b>Direct Impact:</b>                        | Negative impact       |
| <b>Impact on Setting:</b>                    | Negative impact       |
| <b>Mitigation:</b>                           | None                  |

The aqueduct is visible from the towpath and the surrounding countryside to north, south, east and west.

The proposed relocation of the overhead lines along the eastern boundary of the Intel campus heading north west, will be visible from the aqueduct though this view will be partially interrupted by trees. We would regard the likely impact of the overhead lines and the construction of the tower structures along the eastern boundary of the Intel campus heading north west having a negative impact directly and upon the setting of the aqueduct.

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#### 14.4.2.6 Collector's House



Overlooking the aqueduct and canal and sited on the west bank of the canal is the remains of the 'Collectors House' the dwelling of the lengthsman or toll keeper, who was responsible for maintaining the water level on this stretch of canal and for levying tolls of passing barge traffic on behalf of the company.

Built of coursed limestone rubble with matching limestone dressed cut stone around opes – in an unusual plan form comprising a north sough rectangular form with a full half round bow at each of the north and south gables, it sits abutting the canal with particularly good views to east and south and elsewhere good

views all around.

Windows and door way are currently blocked up to deny access and the building is in poor condition, apparently partially roofless, and is painted over in a naïve form of trompe l'oeil illustrating curtained windows, plants against the front wall, and a central door - albeit having at some stage in the last ten years undergone some consolidation repair of stonework.

|                                              |                        |
|----------------------------------------------|------------------------|
| <b>Date of Construction:</b>                 | 1794                   |
| <b>Protected Structure Record Reference:</b> | PPS-10                 |
| <b>Special interest:</b>                     | Architectural, social, |
| <b>Special interest Rating:</b>              | Regional               |
| <b>Distance from Application Site:</b>       | 200 metres             |
| <b>Direct Impact:</b>                        | Negative impact        |
| <b>Impact on Setting:</b>                    | Negative impact        |
| <b>Mitigation:</b>                           | None                   |

The house is visible from the towpath and partially visible from the surrounding countryside to, south, east and west albeit partially obscured by tree and plant growth.

The proposed relocation of the overhead lines along the eastern boundary of the Intel campus heading north west, will be visible from the house though this view will be partially interrupted by trees.

We would regard the likely impact of the overhead lines and the construction of the tower structures along the eastern boundary of the Intel campus heading north west as having a negative impact directly and upon the setting of the Collectors House.

#### 14.4.2.7 Sandford Bridge



Sandfords Bridge carries Kellystown Lane over the Rye Water and is located west of the Intel Campus.

The bridge is three-arched and is approached by causeways on either side, that to the south running for a greater distance than the northern causeway.

The bridge is constructed with limestone rubble and the arch rings are comprised of squared limestone voussoirs.

The arches are semi-circular, with corbels projecting from the piers and abutments at the springs of the arches. There are prismatic cutwaters on the upstream and downstream sides and these rise to the parapet to provide triangular refuges. The bridge is narrow, with a carriageway of approximately 3.2 metres.

The style of the bridge is typical of the early eighteenth century, with squared voussoirs laid radially to form a parallel arch ring. There were members of the Sandford family in the locality in the latter part of the seventeenth century and the first part of the eighteenth and it is possible that the bridge could have been built during the later seventeenth century. It was certainly in existence by 1752 when it was depicted on Noble and Keenan's map of County Kildare.

|                                              |                                |
|----------------------------------------------|--------------------------------|
| <b>Date of Construction:</b>                 | Early 18 <sup>th</sup> century |
| <b>Protected Structure Record Reference:</b> | PPS-19                         |
| <b>Special interest:</b>                     | Architectural, technical       |
| <b>Special interest Rating:</b>              | Regional                       |
| <b>Distance from Application Site:</b>       | 1.7 kilometres                 |
| <b>Direct Impact:</b>                        | None                           |
| <b>Impact on Setting:</b>                    | None                           |
| <b>Mitigation:</b>                           | None                           |

The bridge will not be directly impacted by the proposed works.

The setting of the bridge at present is the river corridor and the bridge is not readily visible, other than from the river bank in the vicinity, due to tree cover. The river corridor will remain as it is. The overhead line development proposed will not result in an alteration to its setting.

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#### 14.4.2.8 Cope Bridge



The construction of the section of the Royal Canal between Broadstone, in Dublin, and Mullingar, took place between 1790 and 1806, to the designs of engineer Richard Evans, until his death in 1802.

Cope Bridge, next to Confey Abbey, was built in 1795. It has been substantially altered to become a two arch bridge to facilitate rail traffic beneath its southern ramp and is constructed of coursed limestone rubble with cut limestone dressings.

It is built to a generic design, replicated in many places along the canal route. The chief variations between the various bridges on the canal would be the rise and the width. The rise is determined by the level of the canal as the bridge needs to rise to a sufficient headroom for horses and pedestrians to pass beneath the bridge on the towpath; in this instance the bridge rises well above landfall to each end and there is a substantial hump in the road as it crosses the bridge. The width of the bridge between the parapets is determined by the width of the road that approaches and crosses over – Cope bridge being a single width bridge.

|                                              |                          |
|----------------------------------------------|--------------------------|
| <b>Date of Construction:</b>                 | 1795                     |
| <b>Protected Structure Record Reference:</b> | PPS-20                   |
| <b>Special interest:</b>                     | Architectural, technical |
| <b>Special Interest Rating:</b>              | Regional                 |
| <b>Distance from Application Site:</b>       | 1.5 kilometres           |
| <b>Direct Impact:</b>                        | None                     |
| <b>Impact on Setting:</b>                    | Neutral impact           |
| <b>Mitigation:</b>                           | None                     |

Cope Bridge is mainly visible from the R149 and L1015 roads to the north and at the level of the canal and the canal towpath.

There is tree cover between the bridge and the application site extending northerly beyond the eastern fringes of the Intel Campus. The proposed relocation of the overhead lines along the eastern boundary of the Intel campus heading north and north west, will be largely interrupted by trees.

We would regard the likely impact of the overhead lines and the construction of the tower structures along the eastern boundary of the Intel campus heading north and north west as having a neutral impact upon the setting of the bridge.

#### 14.4.2.9 Hillford House



Hillford is a large detached house in the townland of Leixlip. The house is not visible from the subject development site, being at a distance of 1.1 kilometres and visually separated from the development lands by urban and suburban infill development as well as tree planting along road boundaries between it and the Intel campus metres.

The appearance of the house as seen in the photograph above suggests a mid-nineteenth century date. The house is not visible on mapping re-dating the 1850s.

|                                              |                |
|----------------------------------------------|----------------|
| <b>Date of Construction:</b>                 | C. 1850        |
| <b>Protected Structure Record Reference:</b> | PPS-21         |
| <b>Special interest:</b>                     | Architectural, |
| <b>Special interest Rating:</b>              | Regional       |
| <b>Distance from Application Site:</b>       | 1.1 kilometres |
| <b>Direct Impact:</b>                        | None           |
| <b>Impact on Setting:</b>                    | Neutral impact |
| <b>Mitigation:</b>                           | None           |

Hillford is at a considerable distance from the application site, being approximately 1.1 kilometre from the proposed works at their nearest point.

There would be no direct impact on the house or its lands arising from the proposed development due to the distance of the house from the application site and the degree of screening.

Neither would the proposed Works noticeably impact upon the setting of Hillford House.

#### 14.4.3 NATIONAL INVENTORY OF ARCHITECTURAL HERITAGE

A number of structures that are listed in the National Inventory of Architectural Heritage (NIAH) are also within relatively close distance of the application site. A number of these such as Deey Bridge and Lock (Reg Ref: 11900602) and the Wonderful Barn (Reg Ref: 11901102) are already protected structures and have been already addressed in this report.

The grounds of Collinstown House (RPS Ref: B11-117) have been assessed as part of the NIAH garden survey, which concluded *"main features unrecognisable – peripheral features visible"*.

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28 NOV 2022

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#### 14.4.3.1 Catholic Church of Our Lady's Nativity



The NIAH describes the Church in the following Terms:

*"Detached five-bay double-height Catholic Church, c.1835, on a cruciform plan originally barn-style single-cell. Extensively renovated and extended, 1984, with single-bay double-height transepts added to north-east and to south-west having single-bay single-storey gabled projecting porches to elevations to south-east, and three-bay single-storey parallel ranges to elevations to north-west. Gable-ended roofs (continuing into lean-to section to parallel ranges to transepts; gabled to porches). Replacement artificial slate, 1984. Rolled concrete ridge tiles. Cut-stone gabled bellcote to gable to south-east with hood moulding over bell opening and cross finial to apex. Overhanging timber eaves and bargeboards. Replacement iron rainwater goods, 1984. Roughcast walls (probably replacement). Unpainted. Rendered dressings to elevation to south-east including corner piers with elongated finials over, profiled section to entrance bay to centre (continuing into bellcote) and dressings to gable forming*

*'pediment'. Pointed-arch window openings to nave and to transepts. Stone sills (concrete to transepts). Rendered dressings to nave. Fixed-pane windows. No openings to chancel to north-west. Round-headed recessed panels to ground floor to elevation to south-east with moulded surrounds containing statuary. Ogee-headed window openings over. Cut-stone surrounds with hood mouldings over. Traceried (two-light) timber windows with fixed-pane diamond-leaded glazing. Oculus window to gable with rendered surround having hood moulding over. Fixed-pane timber window. Pointed-arch door opening. Hood moulding over. Timber panelled door. Traceried timber overlight with leaded glazing. Set back from road in own grounds on an elevated site. Detached three-bay single-storey outbuilding, c.1835, to north-west originally with square-headed integral carriageway. Renovated, 1984, with carriageway remodelled. Hipped roof with slate. Clay ridge tiles. Red brick chimney stack. Cast-iron rainwater goods on rendered eaves course. Rendered walls. Ruled and lined. Painted. Square-headed openings (window opening to right in square-headed recessed panel originally integral carriageway). Replacement concrete sill, c.1985. Replacement timber casement window (original window opening now blocked-up). Replacement timber door, c.1985. Gateway, c.1835, to south-east comprising pair of limestone ashlar polygonal piers with stringcourses and cut-stone capping having cast-iron double gates and rubble stone flanking boundary wall."*

The NIAH Appraisal is as follows:

*"The Catholic Church of Our Lady's Nativity, originally built as a simple barn-like single-cell church typical of those built immediately following Catholic Emancipation in 1829, has been extensively renovated in the late twentieth century leading to the loss of some of the original form and fabric. The church is of considerable social and historical interest as the ecclesiastical centre for the Catholic population in the locality and attests to the growing confidence of that community following Emancipation. The original form of the church is still recognisable in its present state and is distinguished by fine, if reserved, detailing, including cut-stone dressings to some openings, traceried timber windows and an attractive bellcote to the gable that identifies the church in the landscape. The stone and render detailing is a good example of the high quality of stone masonry and*

*craftsmanship traditionally practised in the locality (and is continued within the church in stained glass windows of some artistic merit), and is a feature missing from the later ranges (possibly built to commemorate the one hundred and fiftieth anniversary of the church) that are of little inherent architectural merit. The church is attractively positioned on an elevated site, emphasising its importance in the locality, and is accompanied by a small-scale building to north-east, the original purpose of which is uncertain, but which retains some of its original form and fabric. Announcing the entrance in to the grounds on the side of the road is a fine gateway to south-east that, again, is indicative of the high quality of stone work in the Leixlip and which retains early cast-iron gates."*

|                                        |                                             |
|----------------------------------------|---------------------------------------------|
| <b>Date of Construction:</b>           | 1830 - 1840                                 |
| <b>NIAH Record Reference:</b>          | 11804033                                    |
| <b>Special interest:</b>               | Architectural, Artistic, Historical, Social |
| <b>Special interest Rating:</b>        | Regional                                    |
| <b>Distance from Application Site:</b> | 1.1 kilometres                              |
| <b>Direct Impact:</b>                  | None                                        |
| <b>Impact on Setting:</b>              | Neutral impact                              |
| <b>Mitigation:</b>                     | None                                        |

The Church is at a considerable distance from the application site, being approximately 1.1 kilometres from the proposed works at their nearest point.

There would be no direct impact on the Church or its lands arising from the proposed development due to the distance of the Church from the application site and the degree of screening.

Neither would the proposed Works noticeably impact upon the setting of the Church.

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28 NOV 2022

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#### 14.4.3.2 Newtown Hill House



The NIAH describes Newtown Hill House in the following Terms:

*"Detached three-bay two-storey house, c.1765, possibly over basement retaining most early aspect with single-bay two-storey pedimented entrance breakfront, single-bay single-storey advanced flanking linking bays and single-bay two-storey projecting flanking pavilion blocks. Renovated, c.1950. Undergoing renovation, 2002-3. Hipped roofs with slate. Clay ridge tiles. Roughcast*

*chimney stacks. Sprocketed eaves to pavilion block with right (north). Cast-iron rainwater goods on eaves course. Rendered walls to central block. Painted. Rendered dressings including quoins to corners and to breakfront, moulded rendered course to eaves and moulded surround to pediment. Roughcast walls to remainder (replacement, 2002, to pavilion block to north). Painted (unpainted to pavilion block to north). Square-headed window openings to central block. Stone sills. 6/6 and 6/3 timber sash windows. Round-headed door opening. Replacement moulded rendered doorcase, c.1950, with open bed pediment over. Replacement glazed timber door, c.1950, with Gothic-style traceried overlight. Round-headed door openings to linking blocks. Timber panelled doors. Timber overpanels. Venetian-style window openings to ground floor pavilion blocks. 6/6 timber sash windows with Gothic-style traceried overlights. Fixed-pane timber sidelights. Square-headed openings (slit-style) to first floor. Fittings not discerned. Set back from road in own landscaped grounds. Forecourt to front. Gateway, c.1765, to south-east comprising pair of rubble stone piers with cut-stone capping having ball finials, decorative wrought iron gates, squared rubble stone curved flanking walls and roughcast outer piers with cut-stone capping having ball finials."*

The NIAH Appraisal is as follows:

*"Newtown Hill (House) is an attractive, substantial late eighteenth-century house that retains most of its original form and character. Composed on a Palladian plan comprising a central block with linking wings or bays leading to pavilion blocks, it would appear that this is a true interpretation of the 'economic villa' house, the slit-style openings to the first floor of the pavilion blocks suggesting that they may incorporate outbuildings. The house is of social and historical significance, representing the substantial dwellings built by the prosperous class in the late eighteenth century, and the scale and fine detailing of Newtown Hill (House) suggests that it was originally built by a patron of considerable status in the locality. The house retains many important early or original salient features and materials, including multi-pane timber sash windows and slate roofs having cast-iron rainwater goods. The retention of an early external aspect suggests that the house may retain early or original features and fittings of significance to the interior. Set in its own landscaped grounds, and approached by a tree-lined avenue, the house is a prominent landmark in the locality and is announced on the side of the road by a fine gateway that retains early wrought iron gates of some artistic interest."*

|                                        |                                             |
|----------------------------------------|---------------------------------------------|
| <b>Date of Construction:</b>           | 1750 - 1780                                 |
| <b>NIAH Record Reference:</b>          | 11804075                                    |
| <b>Special interest:</b>               | Architectural, Artistic, Historical, Social |
| <b>Special interest Rating:</b>        | Regional                                    |
| <b>Distance from Application Site:</b> | 1.3 kilometres                              |
| <b>Direct Impact:</b>                  | None                                        |
| <b>Impact on Setting:</b>              | Neutral impact                              |
| <b>Mitigation:</b>                     | None                                        |

The House is at a considerable distance from the application site, being approximately 1.3 kilometres from the proposed works at their nearest point.

There would be no direct impact on Newtown Hill House or its lands arising from the proposed development due to the distance of the house from the application site and the degree of screening.

Neither would the proposed Works noticeably impact upon the setting of Newtown Hill House.

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28 NOV 2022

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#### 14.4.3.3 Pike Bridge



The NIAH describes Pike Bridge in the following Terms:

*"Two-arch rubble stone hump back road bridge over canal and railway line, dated 1793, with ashlar voussoirs and cut-stone date stone/plaque. Broken coursed squared rubble stone walls. Cut-stone date stone/plaque. Cut-stone coping to parapet walls. Two elliptical arches. Ashlar voussoirs. Squared rubble stone soffits with traces of render over. Sited spanning Royal Canal and Midland and Great Western Railway line. Grass banks to canal with tow path to north, and grass banks to railway line."*

The NIAH Appraisal is as follows:

*"Pike Bridge is a fine cut-stone bridge that is somewhat unusual, spanning the Royal Canal and the Midland and Great Western Railway line – the bridge is one of a number of bridges on the sections of the Royal Canal and Midland and Great Western Railway line that pass through County Kildare and as such it is of considerable social and historic significance, representing a component of the canal and railway network development in Ireland in the late eighteenth and mid nineteenth centuries, which encouraged the commercialisation and/or industrialisation of the country. The construction of the bridge attests to the high quality of stone masonry traditionally practised in the locality, and retains fine, crisp joints. The construction of the arches that have retained their original shape is of technical or engineering merit."*

|                                        |                                              |
|----------------------------------------|----------------------------------------------|
| <b>Date of Construction:</b>           | 1790 - 1795                                  |
| <b>NIAH Record Reference:</b>          | 11900601                                     |
| <b>Special interest:</b>               | Architectural, Historical, Social, Technical |
| <b>Special interest Rating:</b>        | Regional                                     |
| <b>Distance from Application Site:</b> | 3 kilometres                                 |
| <b>Direct Impact:</b>                  | None                                         |
| <b>Impact on Setting:</b>              | Neutral impact                               |
| <b>Mitigation:</b>                     | None                                         |

The Bridge is at a considerable distance from the application site, being approximately 3 kilometres from the proposed works at their nearest point.

There would be no direct impact on Pike Bridge arising from the proposed development due to the distance of the Bridge from the application site and the degree of screening.

Neither would the proposed Works noticeably impact upon the setting of Pike Bridge.

### 14.4.3.4 Deey Bridge

Deey Bridge and Lock has previously been assessed as a Protected Structure (RPS Ref: B06-14) under Section 14.4.1 of this report.



The NIAH describes Deey Bridge in the following Terms:

*"Single-arch rubble stone road bridge over canal, dated 1793, with ashlar voussoirs and cut-stone date stone/plaque. Irregular coursed squared rubble stone walls. Cut-stone date stone/plaque. Cut-stone coping to parapet walls. Single shallow segmental arch. Ashlar voussoirs. Squared rubble stone soffits with traces of render over. Sited spanning Royal Canal. Grass banks to canal. Canal lock, c.1795, to west with cut-stone retaining walls having timber lock gates over with integrated pedestrian bridge and possibly retaining early mechanisms."*

The NIAH Appraisal is as follows:

*"Deey Bridge is a fine rubble stone bridge that forms an imposing feature on the Royal Canal and is one of a number of bridges on the section of that canal that passes through County Kildare – as such it is of considerable social and historic significance, representing the canal network development in Ireland in the late eighteenth century that encouraged the commercialisation and/or industrialisation of the country. The construction of the bridge in squared rubble stone attests to the high quality of stone masonry traditionally practised in the development of the canal, and retains fine, crisp joints. The construction of the arch that has retained its original shape is of technical or engineering merit. Also of technical interest is the attendant lock to west, which possibly retains early mechanisms."*

|                                        |                                              |
|----------------------------------------|----------------------------------------------|
| <b>Date of Construction:</b>           | 1790 - 1795                                  |
| <b>NIAH Record Reference:</b>          | 11900602                                     |
| <b>Special interest:</b>               | Architectural, Historical, Social, Technical |
| <b>Special interest Rating:</b>        | Regional                                     |
| <b>Distance from Application Site:</b> | 70 metres                                    |
| <b>Direct Impact:</b>                  | None                                         |
| <b>Impact on Setting:</b>              | Neutral impact                               |
| <b>Mitigation:</b>                     | None                                         |

Deey Bridge and the 13<sup>th</sup> Lock are mainly visible at the level of the canal and the canal towpath, though they are also visible from the road that crosses over the bridge.

There are no significant views of the bridge or the canal lock from any other public place. There is tree cover between the bridge and lock and the nearby R148 (Maynooth Road), beyond which the application site extends beyond the eastern fringes of the Intel Campus. The proposed relocation of the overhead lines along the southerly boundary of the Intel campus heading east, will be visible from the bridge, though this view will be partially interrupted by trees. We would regard the likely impact of the overhead lines and the construction of the tower structures along the southern boundary of the Intel campus having a neutral impact upon the setting of the bridge and lock.

Notwithstanding the proximity of the Bridge and Lock to the development lands, there would be no direct impact on Deey Bridge and the 13th Lock arising from the proposed development due to the distance of the Bridge from the application site and the degree of screening.

Neither would the proposed Works noticeably impact upon the setting of Deey Bridge and the 13th Lock.

### 14.4.3.5 Leixlip Gate



The NIAH describes Leixlip Gate in the following Terms:

*"Gateway, c.1760, comprising pair of limestone ashlar piers with moulded cornices having wrought iron gates with spike finials and square-headed flanking pedestrian gateways with keystones. Detached two-bay two-storey gate lodge, c.1760, to west. Now disused and part derelict. Gable-ended roof with slate. Clay ridge tiles. Rendered chimney stack. Cast-iron rainwater goods on rendered eaves band. Roughcast walls. Unpainted. Square-headed window openings (in segmental-headed recesses to ground floor to south). Stone sills. No fittings (some blocked-up with concrete block). Square-headed door opening. No fittings. Overgrown grounds to site."*

The NIAH Appraisal is as follows:

*"Leixlip Gate is a fine and attractive mid eighteenth-century gateway to the Castletown estate. Composed of a pair of piers, the quality of the masonry is of a high standard with sharp lines and narrow mortar joints to the ashlar stonework. The retention of early surviving wrought iron gates is also of note. The gateway, although of secondary importance to the primary entrance to the estate (located at the end of Main Street, Celbridge (11805063/KD-11-05-63)), is nevertheless of social and historic importance as an integral component of the Castletown estate. Attractively set at the end of an avenue, the gateway also forms a self-contained sub-group with the gate lodge to west."*

|                                        |                                             |
|----------------------------------------|---------------------------------------------|
| <b>Date of Construction:</b>           | 1740 - 1780                                 |
| <b>NIAH Record Reference:</b>          | 11901101                                    |
| <b>Special interest:</b>               | Architectural, Artistic, Historical, Social |
| <b>Special interest Rating:</b>        | Regional                                    |
| <b>Distance from Application Site:</b> | 1.3 kilometres                              |
| <b>Direct Impact:</b>                  | None                                        |
| <b>Impact on Setting:</b>              | Neutral impact                              |
| <b>Mitigation:</b>                     | None                                        |

Leixlip Gate is located at the southern end of a narrow tree lined avenue and is not readily visible from any public place. There is substantial tree cover between Leixlip Gate and the application site. The proposed relocation of the overhead lines along the southerly boundary of the Intel campus heading east, will not be visible from the Leixlip Gate. We would regard the likely impact of the overhead lines and the construction of the tower structures along the southern boundary of the Intel campus as having a neutral impact upon the setting of the bridge and lock.

Neither would there be any direct impact on Leixlip Gate arising from the proposed development due to the distance of Leixlip Gate from the application site and the degree of screening.

Neither would the proposed Works noticeably impact upon the setting of Leixlip Gate

#### 14.4.3.6 Wonderful Barn

The Wonderful Barn Complex has previously been assessed as a Protected Structure (RPS Ref: B06-15) under Section 14.4.1 of this report.



The NIAH describes the Wonderful Barn in the following Terms:

*"Freestanding single-bay five-stage grain store, dated 1743, on a cruciform plan with series of four single-bay single-storey gabled projecting bays. Now disused. Flat roof behind parapet approached by flight of ninety-four cut-limestone steps. Part creeper- or ivy-covered slate hung (lower stages) or lime rendered (upper stages) battered walls with rough faced cut-limestone stringcourses including rough faced cut-limestone stringcourse supporting battlemented parapet having cut-limestone coping. Square-headed*

*door opening (west) below cut-limestone date stone ("1743") with lintel framing timber boarded double doors. Triangular window openings (upper stages) with rough faced cut-limestone sill courses, and concealed dressings with monolithic hood mouldings framing fixed-pane fittings. Interior with limewashed red brick English bond dome vaulted chambers. Set in unkempt grounds."*

The NIAH Appraisal is as follows:

*"A grain store 'EXECUT'D BY JOHN GLINN' representing an important component of the eighteenth-century built heritage of County Kildare with the architectural value of the composition, one allegedly erected by Katherine Conolly (née Conyngham) (1662-1752) as a relief scheme in response to the so-called 'Black Spring' (1741), confirmed by such attributes as the cruciform footprint; the conical silhouette; the 'loop'-like openings; and the parapeted summit doubling as a 'crow's nest' or viewing platform commanding panoramic vistas back to Castletown and the Conolly Obelisk. A prolonged period of neglect notwithstanding, the form and massing survive intact together with substantial quantities of the original fabric, both to the exterior and to the interior, including a partial slate hung surface finish: meanwhile, limewashed dome vaulted chambers pinpoint the engineering or technical dexterity of a grain store forming the centrepiece of a self-contained group alongside adjacent dovecotes (---) with the resulting ensemble making a picturesque visual statement in a rural street scene."*

|                                        |                                              |
|----------------------------------------|----------------------------------------------|
| <b>Date of Construction:</b>           | 1740 - 1745                                  |
| <b>NIAH Record Reference:</b>          | 11901102                                     |
| <b>Special interest:</b>               | Architectural, Historical, Social, Technical |
| <b>Special interest Rating:</b>        | National                                     |
| <b>Distance from Application Site:</b> | 1.5 kilometres                               |
| <b>Direct Impact:</b>                  | None                                         |
| <b>Impact on Setting:</b>              | Neutral impact                               |
| <b>Mitigation:</b>                     | None                                         |

The Wonderful Barn is at a distance from the application site, which cannot be seen from the land in the vicinity of the barn.

There would be no impact on the setting of the barn at ground level as a consequence of these works.

From the top of the stairs leading up the side of the barn there is a view over a wide expanse in all directions, including a view of the application site. However, this is at a distance of 1.5 kilometres, and the Barn is separated from the application site and proposed development works by urban and suburban housing, industry, roads and other uses.

As a result, the provision of the new works will be in line with existing trends and the resulting visual impact would be nil.

#### 14.4.4 NON-PROTECTED STRUCTURES DEEMED TO BE OF HERITAGE IMPORTANCE

As noted at Section 14.3.1.5 of this report, there are a number of structures in the vicinity of the application site which are Non-Protected Structures but are deemed to be of Heritage Importance:

##### 14.4.4.1 Royal Canal – Blakestown, Collinstown and Leixlip



Leixlip Confeiy.

Construction of the Royal Canal began in 1790 and the stretch between Dublin and Mullingar opened for traffic in 1806.

That portion of the canal to the west of the lock adjacent to Deey Bridge is slightly below the level of the R148 and the application site and located approximately 70 metres from the site. To the east of Deey Bridge the canal is at a lower level and runs east to Louisa Bridge from which it heads north, again at a lower level to the road while rising above the level of the surrounding countryside to east and west at the Rye Water Aqueduct, then on again toward Cope Bridge and

The portion of the canal east of the development lands between Louisa Bridge and Cope Bridge is partially screened from the eastern boundary of the Intel campus by a dense belt of trees

|                                        |                                              |
|----------------------------------------|----------------------------------------------|
| <b>Date of Construction:</b>           | 1790 - 1795                                  |
| <b>Protected Structure:</b>            | No                                           |
| <b>Special interest:</b>               | Architectural, Historical, Social, Technical |
| <b>Special interest Rating:</b>        | National                                     |
| <b>Distance from Application Site:</b> | Between 70 and 500 metres                    |
| <b>Direct Impact:</b>                  | Negative                                     |
| <b>Impact on Setting:</b>              | Negative                                     |
| <b>Mitigation:</b>                     | None                                         |

It is noted that while the stretch of the canal in the vicinity of the application site is not a protected structure, other than the 13<sup>th</sup> Lock and Deey Bridge, that other stretches of the Royal Canal within County Kildare are included on the record of protected structures.

In addition, significant elements of the canal infrastructure are proposed for addition to the Record of Protected Structures under the Draft Kildare County Development Plan 2023 – 2029. These are as follows:

|        |                    |                         |
|--------|--------------------|-------------------------|
| PPS-06 | Louisa's Bridge    | Leixlip                 |
| PPS-03 | Station House      | Leixlip                 |
| PPS-09 | Rye Water Aqueduct | Confey / Leixlip        |
| PPS-10 | Collector's House  | Confey                  |
| PPS-19 | Sandsford Bridge   | Blakestown / Kellystown |
| PPS-20 | Cope Bridge        | Newtown                 |

In view of the location of the canal at a lower level than the application site and in view of the belts of trees parallel to the canal to the north there will be no impact on the setting or character of the canal arising from the proposed development between Deey Bridge and Louisa Bridge.

From Louisa Bridge up to That easterly bend of the canal north of the Rye Water Aqueduct the proposed development works will in our opinion significantly impact negatively upon both the setting and character of the canal.

#### 14.4.4.2 Lock-Keeper's Cottage – Collinstown



The Royal Canal was commenced in 1790 and this stretch appears to have been completed around 1795.

Lock keepers were employed to operate the locks and lock gates and they were provided with a house adjacent to the lock, of a scale akin to a gate lodge.

Typically, these were single-storey, single-pile houses with gabled roofs and with a centrally-placed front door flanked by a single window on either side. It was usual for lock-keeper's cottages

to be built to a uniform design along the length of the canal, though the style could change and could vary.

The lock-keeper's cottage at Blakestown, beside the 13th Lock and adjacent to Deey Bridge, is unusual in that it is placed at right-angles to the canal; (most face the lock.)

It is rough-cast rendered masonry construction – most probably coursed limestone rubble, and the render appears to be a later alteration as it covers the raised quoins. The front door may originally have been at the gable end, facing the canal and this is where the entrance is now, leading into a later flat-roofed extension. There is another extension at the rear. The cottage is boarded up at present.

|                                        |                                  |
|----------------------------------------|----------------------------------|
| <b>Date of Construction:</b>           | 1790 - 1795                      |
| <b>Protected Structure:</b>            | No                               |
| <b>Special interest:</b>               | Architectural, Social, Technical |
| <b>Special interest Rating:</b>        | Regional                         |
| <b>Distance from Application Site:</b> | 70 metres                        |
| <b>Direct Impact:</b>                  | None                             |
| <b>Impact on Setting:</b>              | None                             |
| <b>Mitigation:</b>                     | None                             |

The lock-keeper's cottage at Blakestown faces east, parallel to the canal and to the R148 and hence it does not face north towards the application site. There is a screen of trees between the cottage and the road.

Despite the proximity of the development works site to the cottage there will be no significant impact on the cottage or on its setting arising from the proposed overhead line diversion.

#### 14.4.4.3 Blakestown House– Blakestown



A house and outbuildings at this location, were depicted on the first-edition Ordnance Survey map of 1839 and the form and layout of the house had not altered significantly by 1870 when the second-edition map was published, though the outbuildings had increased in number.

At some point during the last thirty years of the nineteenth century the house was rebuilt, and it has a different shape and form on the Ordnance Survey map of circa 1900.

The outbuildings also altered in that time. Part of the land to the front of the house was taken for road widening in more recent years.

The house is three-bay and two-storey, with a single-storey, single-bay annex on the eastern side. The roof is steeply-pitched, gable-ended and slated, though the annex is hipped. The façade is rendered and painted. The windows are single-paned timber sashes. Many of the outbuildings that were shown on the Ordnance Survey map of c.1900 are no longer present, though there is still a significant number, with an L-shaped range to the north of the house and another building to the east, together forming an enclosed yard. The outbuildings are constructed with limestone rubble and with dressed-limestone quoins and margins to the windows and doors.

|                                        |                        |
|----------------------------------------|------------------------|
| <b>Date of Construction:</b>           | Mid-nineteenth century |
| <b>Protected Structure:</b>            | No                     |
| <b>Special interest:</b>               | Architectural, Social  |
| <b>Special interest Rating:</b>        | Local                  |
| <b>Distance from Application Site:</b> | 850 metres             |
| <b>Direct Impact:</b>                  | None                   |
| <b>Impact on Setting:</b>              | None                   |
| <b>Mitigation:</b>                     | None                   |

Blakestown House and its outbuildings lie within the land owned by the applicant but are outside the application site. No works are proposed that would have a direct impact on the house, its outbuildings or an orchard that stands to the west of the house.

Blakestown House has been located within an industrial complex for some years and its setting has been altered significantly as a result.

Despite the proximity of the development works site to the cottage there will be no significant impact on the Blakestown House or on its setting arising from the proposed overhead line diversion.

#### 14.4.4.4 Nelsons Cottage – Leixlip



The first-edition Ordnance Survey map of 1839 shows that there was a house on or near the site of Nelson's Cottage at that time.

The style of the house suggests a later nineteenth century date, though the house has been altered significantly and it may be that the walls are of an

earlier period.

At some point the house has been re-roofed, with the roof level raised and it is probable that the window openings have been enlarged – the windows are certainly of a more recent time.

The valuation boundaries shown on the second-edition Ordnance Survey map show that this house was not part of the property associated with Music Hall, the larger house that was formerly set back from the road near Nelson's Cottage but was on its own land.

|                                        |                        |
|----------------------------------------|------------------------|
| <b>Date of Construction:</b>           | Mid-nineteenth century |
| <b>Protected Structure:</b>            | No                     |
| <b>Special interest:</b>               | Architectural, Social  |
| <b>Special interest Rating:</b>        | Local                  |
| <b>Distance from Application Site:</b> | 140 metres             |
| <b>Direct Impact:</b>                  | None                   |
| <b>Impact on Setting:</b>              | None                   |
| <b>Mitigation:</b>                     | None                   |

The house is within the Campus.

The setting of the house will not be impacted. The house is set back slightly from the frontage to the R148, while to the rear there is an access road within the site, beyond which are industrial buildings.

## 14.5 PREDICTED EFFECTS

The potential impacts of the proposed development works have been set out and discussed above in relation to each individual building or other structure. The impacts are summarised here and are listed in tabular form.

It is noted that there are several protected structures, proposed protected structures, heritage structures under the National Inventory of Architectural Heritage and other heritage properties of significance within the vicinity of the site, and others of high importance at a greater distance and in each case the potential impacts have been examined.

The landscape in the vicinity of the site is varied. The Intel Campus onsite itself is a well-established industrial operation with substantial buildings covering a large area. The R148 south of the subject site also presents a significantly modern and industrial character particularly in the presence along its route of other industrial or commercial uses in along the southern side of the R148 directly opposite the Intel Campus.

To the south of the site the built-up area around Leixlip approaches close to the site. To the north, west and south-west the land is more agricultural, though with significant numbers of houses and other buildings scattered through the area, some in clusters.

West and south of the site, although separated from it by intervening agricultural lands lie the substantial demesnes of Carton House and Castletown House which are of high significance. Associated with these, though not within the demesnes, are the Conolly Folly and the Wonderful Barn Complex.

East and north-east of the subject development site is the Royal Canal, running parallel in close proximity to the proposed route of the overhead line diversion from the Louisa Bridge over the Rye Water Aqueduct and on towards Confey. This length of the Canal is an impressive natural environment and also contains a number of proposed additions to the record of protected structures.

### 14.5.1 DIRECT IMPACTS

Direct impacts will occur to protected structures and other structures of architectural heritage merit as a consequence of the proposed development works. Most notably these include Louisa Bridge, the Hexagonal Well, the Romanesque Bath, the Rye Water Aqueduct, the Collectors House and that part of the Royal Canal between Louisa Bridge and Confey.

While Deey Bridge and Lock, Nelson's Cottage and Blakestown House are within very close proximity to the proposed works there will be little or no perceptible direct impacts arising from the proposed works upon these elements of the heritage environment.

### 14.5.2 INDIRECT IMPACTS

The proposed development works will have an appreciable indirect impact on the views, prospects or settings of various structures considered. These include Louisa Bridge, the Station House, the Hexagonal Well, the Romanesque Bath, the Rye Water Aqueduct, the Collectors House and that part of the Royal Canal between Louisa Bridge and Confey.

#### 14.5.2.1 Summary of Impacts

**Table 14.5 Protected Structures under the Kildare County Development Plan 2017-2023**

| Ref:    | Structure                                                | Issue                                                                               | Impact   |
|---------|----------------------------------------------------------|-------------------------------------------------------------------------------------|----------|
| B06-07  | Hedsor House                                             | Relocation of the overhead lines and tower structures slightly further to the east. | Positive |
| B06-08  | Ravensdale House                                         | Relocation of the overhead lines and tower structures slightly further to the east. | Positive |
| B06-09  | Carton House and associated outhouses, stables and yards | Relocation of the overhead lines and tower structures slightly further to the east. | Positive |
| B06-09i | Interiors of Carton Demesne (House and Gardens)          | Relocation of the overhead lines and tower structures slightly further to the east. | Positive |
| B06-14  | Deey Bridge (and Lock)                                   | The proposed relocation of the                                                      | Neutral  |

| Ref:    | Structure                                                                                | Issue                                                                                                                                                                                                          | Impact  |
|---------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
|         |                                                                                          | overhead lines slightly further to the east. along the southerly boundary of the Intel campus heading east, will be slightly visible from the bridge, though this view will be partially interrupted by trees. |         |
| B11-13  | Castletown House, Temple, Batty Langley Lodge, Entrance Gates and avenue (and interiors) | None                                                                                                                                                                                                           | Neutral |
| B11-15  | Wonderful Barn Complex                                                                   | None                                                                                                                                                                                                           | Neutral |
| B11-16  | Conolly Folly                                                                            | None                                                                                                                                                                                                           | Neutral |
| B11-117 | Collinstown House                                                                        | None                                                                                                                                                                                                           | Neutral |

**Table 14.6 Proposed Protected Structures under the Draft Kildare County Development Plan 2023 – 2029**

| Ref:   | Structure       | Issue                                                                                                                                                                                                                                                                                                                                                               | Impact                                                                                                                                                                                            |
|--------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PPS-06 | Louisa's Bridge | The proposed relocation of the overhead lines along the southern and eastern boundary of the Intel campus heading north, will be visible from the bridge, though this view will be partially interrupted by trees.                                                                                                                                                  | Negative<br><br>Impact of the overhead lines and the construction of the tower structures along the southern and eastern boundary of the Intel campus upon the setting of the bridge and towpath. |
| PPS-03 | Station House   | The proposed relocation of the overhead lines along the southern and eastern boundary of the Intel campus heading north, will be visible from the Station House west facing windows, though this view will be partly interrupted by the ramp structure located to its west serving the railway station and will also be partially interrupted by trees to the west. | Negative<br><br>Impact of the overhead lines and the construction of the tower structures along the southern and eastern boundary of the Intel campus upon the setting of the Station House.      |
| PPS-07 | Hexagonal Well  | The proposed relocation of the overhead lines along the eastern boundary of the Intel campus heading north, will be                                                                                                                                                                                                                                                 | Negative<br><br>Impact of the overhead lines and the construction of the tower structures along                                                                                                   |

| Ref:   | Structure          | Issue                                                                                                                                                                                                         | Impact                                                                                                                                                                                                             |
|--------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|        |                    | visible from the Hexagonal Well though this view will be partially interrupted by trees.                                                                                                                      | the eastern boundary of the Intel campus directly and upon the setting of the Hexagonal Well.                                                                                                                      |
| PPS-08 | Romanesque Bath    | The proposed relocation of the overhead lines along the eastern boundary of the Intel campus heading north, will be visible from the Romanesque bath though this view will be partially interrupted by trees. | Negative<br><br>Impact of the overhead lines and the construction of the tower structures along the eastern boundary of the Intel campus directly and upon the setting of the Romanesque bath.                     |
| PPS-09 | Rye Water Aquaduct | The proposed relocation of the overhead lines along the eastern boundary of the Intel campus heading north west, will be visible from the aqueduct though this view will be partially interrupted by trees.   | Negative<br><br>Impact of the overhead lines and the construction of the tower structures along the eastern boundary of the Intel campus heading north west directly and upon the setting of the aqueduct.         |
| PPS-10 | Collector's House  | The proposed relocation of the overhead lines along the eastern boundary of the Intel campus heading north west, will be visible from the house though this view will be partially interrupted by trees.      | Negative<br><br>Impact of the overhead lines and the construction of the tower structures along the eastern boundary of the Intel campus heading north west directly and upon the setting of the Collectors House. |
| PPS-19 | Sandsford Bridge   | None                                                                                                                                                                                                          | Neutral                                                                                                                                                                                                            |
| PPS-20 | Cope Bridge        | None                                                                                                                                                                                                          | Neutral                                                                                                                                                                                                            |
| PPS-21 | Hillford House     | None                                                                                                                                                                                                          | Neutral                                                                                                                                                                                                            |

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**Table 14.7 Heritage Structures Noted on The National Inventory of Architectural Heritage**

| Ref:     | Structure                             | Issue                                                                                                                                                                                                                                         | Impact  |
|----------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|
| 11804033 | Catholic Church of Our Ladys Nativity | None                                                                                                                                                                                                                                          | Neutral |
| 11804075 | Newtown Hill House                    | None                                                                                                                                                                                                                                          | Neutral |
| 11900601 | Pike Bridge                           | None                                                                                                                                                                                                                                          | Neutral |
| 11900602 | Deey Bridge                           | The proposed relocation of the overhead lines slightly further to the east. along the southerly boundary of the Intel campus heading east, will be slightly visible from the bridge, though this view will be partially interrupted by trees. | Neutral |
| 11901101 | Leixlip Gate                          | None                                                                                                                                                                                                                                          | Neutral |
| 11901102 | Wonderful Barn                        | None                                                                                                                                                                                                                                          | Neutral |

**Table 14.8 Non-Protected Structures deemed to be of Heritage Importance**

| Ref: | Structure             | Issue                                                                                                                                                                                                                                                       | Impact                                                                                                                                                                                                                                                                                                                               |
|------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Royal Canal           | While the stretch of the canal in the vicinity of the application site is not a protected structure, other than the 13th Lock and Deey Bridge, other stretches of the Royal Canal within County Kildare are included on the record of protected structures. | Negative<br><br>Impact from Louisa Bridge up to the easterly bend of the canal north of the Rye Water Aqueduct of the diverted overhead lines and the construction of the tower structures along the eastern boundary of the Intel campus heading north west directly and upon the upon both the setting and character of the canal. |
| 2    | Lock-Keeper's cottage | None                                                                                                                                                                                                                                                        | Neutral                                                                                                                                                                                                                                                                                                                              |
| 3    | Blakestown House      | None                                                                                                                                                                                                                                                        | Neutral                                                                                                                                                                                                                                                                                                                              |
| 4    | Nelson's Cottage      | None                                                                                                                                                                                                                                                        | Neutral                                                                                                                                                                                                                                                                                                                              |

# 15 ARCHAEOLOGY

## 15.1 INTRODUCTION

This chapter presents the results of an assessment of potential impacts on the archaeological landscape surrounding the proposed development. The proposed development comprises the diversion of an existing overhead line (OHL) at Intel Ireland, Leixlip, Co. Kildare. The purpose of this chapter is to assess the impacts of the proposed development on the surrounding archaeological landscape and is based on both a desktop review of the available archaeological data within and adjacent to the study area, and a site inspection. The report amalgamates desk-based research, GIS mapping and the results of field assessment to identify areas of archaeological potential which are likely to be impacted by the proposed development. An assessment of impacts is presented and mitigatory measures are recommended where appropriate. The visual impact of the proposed development on newly discovered monuments/sites of significance as well as known recorded monuments and items of cultural/architectural heritage is also considered.

### 15.1.1 METHODOLOGY

#### 15.1.1.1 Desktop Review

A primary cartographic source and base-line data for the assessment was the consultation of the Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP) for County Kildare. All known recorded archaeological monuments are indicated on 6 inch Ordnance Survey (OS) maps and are listed in this record. The 1<sup>st</sup> (1837-1842) and 2<sup>nd</sup> (1888-1913) edition OS map for the area as well as aerial photographs were also consulted.

The following sources were consulted for this assessment report:

- The Sites and Monuments Record (SMR)
- The Record of Monuments and Places (RMP)
- The Topographical Files of the National Museum of Ireland ([www.heritagemaps.ie](http://www.heritagemaps.ie))
- Down Survey Barony maps (1656-8) ([www.downsurvey.tcd.ie](http://www.downsurvey.tcd.ie))
- First edition (1837-1842) Ordnance Survey maps
- Second edition Ordnance Survey maps (1888-1913)
- Aerial photographs
- Database of Irish Excavation Reports ([www.excavations.ie](http://www.excavations.ie))
- Kildare County Development Plan 2017-2023

#### Record of monuments and places

A primary cartographic source and base-line data for the assessment was the consultation of the Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP) for County Kildare. All known recorded archaeological monuments are indicated on 6 inch Ordnance Survey (OS) maps and are listed in this record. The SMR/RMP is not a complete record of all monuments as newly discovered sites may not appear in the list or accompanying maps. In conjunction with the consultation of the SMR and RMP the electronic database of recorded monuments which may be accessed at [Historic Environment Viewer \(archaeology.ie\)](http://Historic Environment Viewer (archaeology.ie)) was also consulted.

#### Cartographic sources and aerial photography

The 1<sup>st</sup> (1837-1842) edition and 2<sup>nd</sup> Edition (1888-1913) OS maps for the area were consulted as was OSI aerial photography.

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### Topographical Files - National Museum of Ireland

Details relating to finds of archaeological material and monuments in numerous townlands in the country are contained in the topographical files held in the National Museum of Ireland. In order to establish if any new or previously unrecorded finds had been recovered from the study area these files were consulted on [www.heritagemaps.ie](http://www.heritagemaps.ie) for every townland within and adjacent to the latter.

### Kildare County Development Plan 2017-2023

The Development Plan was consulted for items of archaeological interest which may be affected by the proposed development. The strategies and policies on Archaeological Heritage were consulted for this report and are detailed in Appendix 15.1.

### Excavations Database

The excavations database is an annual account of all excavations carried out under license. The database is available on line at [www.excavations.ie](http://www.excavations.ie) and includes excavations from 1985 to 2022. This database was consulted as part of the desktop research for this assessment to establish if any archaeological excavations had been carried out within or near to the proposed development area.

#### **15.1.1.2 Field Inspection**

The study area was inspected by Tobar Archaeological Services on the 14<sup>th</sup> July 2022. A walk-over survey of all accessible areas of the proposed OHL diversion was carried out and a photographic record made of same.

#### **15.1.1.3 Geographical Information Systems**

GIS is a computer database which captures, stores, analyses, manages and presents data that is linked to location. GIS is geographic information systems which includes mapping software and its application with remote sensing, land surveying, aerial photography, mathematics, photogrammetry, geography and tools that can be implemented with GIS software. A geographic information system (GIS) was used to manage the datasets relevant to the archaeological and architectural heritage assessment and for the creation of all the maps in this section of the report. This involved the overlaying of the relevant archaeological and architectural datasets on georeferenced aerial photographs and road maps (ESRI), where available. The integration of this spatial information allows for the accurate measurement of distances of a proposed development from archaeological sites and the extraction of information on 'monument types' from the datasets. Areas of archaeological sensitivity may then be highlighted in order to mitigate the potential negative effects of a development on archaeological, architectural and cultural heritage.

## **15.2 THE PROPOSED DEVELOPMENT**

A detailed description of the proposed development is outlined in Chapter 4 *Project Description* of the EIAR and in the Outline CEMP. In summary the development will consist of:

- The diversion of an existing 110kV double circuit overhead line (OHL) that extends North/South across the east side of Intel's Leixlip campus
- This will involve the installation of 7 new double circuit steel lattice towers and the replacement of 2 existing double circuit towers and
- The decommissioning and removal of 4 existing towers and associated electrical conductors



Figure 15.1 Site location map.

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## 15.3 THE RECEIVING ENVIRONMENT

### 15.3.1 ARCHAEOLOGY

For the purposes of this report archaeological heritage includes all recorded archaeological monuments listed in the RMP/SMR and shown on the associated maps, newly recorded monuments identified during field inspection/survey, sites identified during archaeological excavations as summarised in the Excavations Database and any find spots listed in the Topographical Files of the National Museum of Ireland.

#### 15.3.1.1 National Monuments

The term 'national monument' as defined in Section 2 of the National Monuments Act (1930) means a monument 'the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto...'. National monuments in State care include those which are in the ownership or guardianship of the Minister for Arts, Heritage and the Gaeltacht (DAHG). Other owners of national monuments are empowered under Section 5 of the National Monuments Act (1930) to appoint the Minister for Housing, Local Government and Heritage (DHLGH) as guardian of such monuments. This means in effect that while the property of such a monument remains vested in the owner, its maintenance and upkeep are the responsibility of the State. Monuments which may be defined as national monuments are also in the ownership or guardianship of Local Authorities which have similar responsibilities under the National Monuments Acts (1930-2004) to DHLGH. For national monuments in the ownership or guardianship of the Minister or a Local Authority or which are subject to a preservation order or temporary preservation order, the prior written consent of the Minister is required for any works at or in proximity to the monument.

No National Monuments are located on or in close proximity to the proposed development site. The nearest National Monument comprises Conolly's Folly (Nat. Mon. No. 681) which is located c. 3 km to the west-south-west (Figure 15.2).

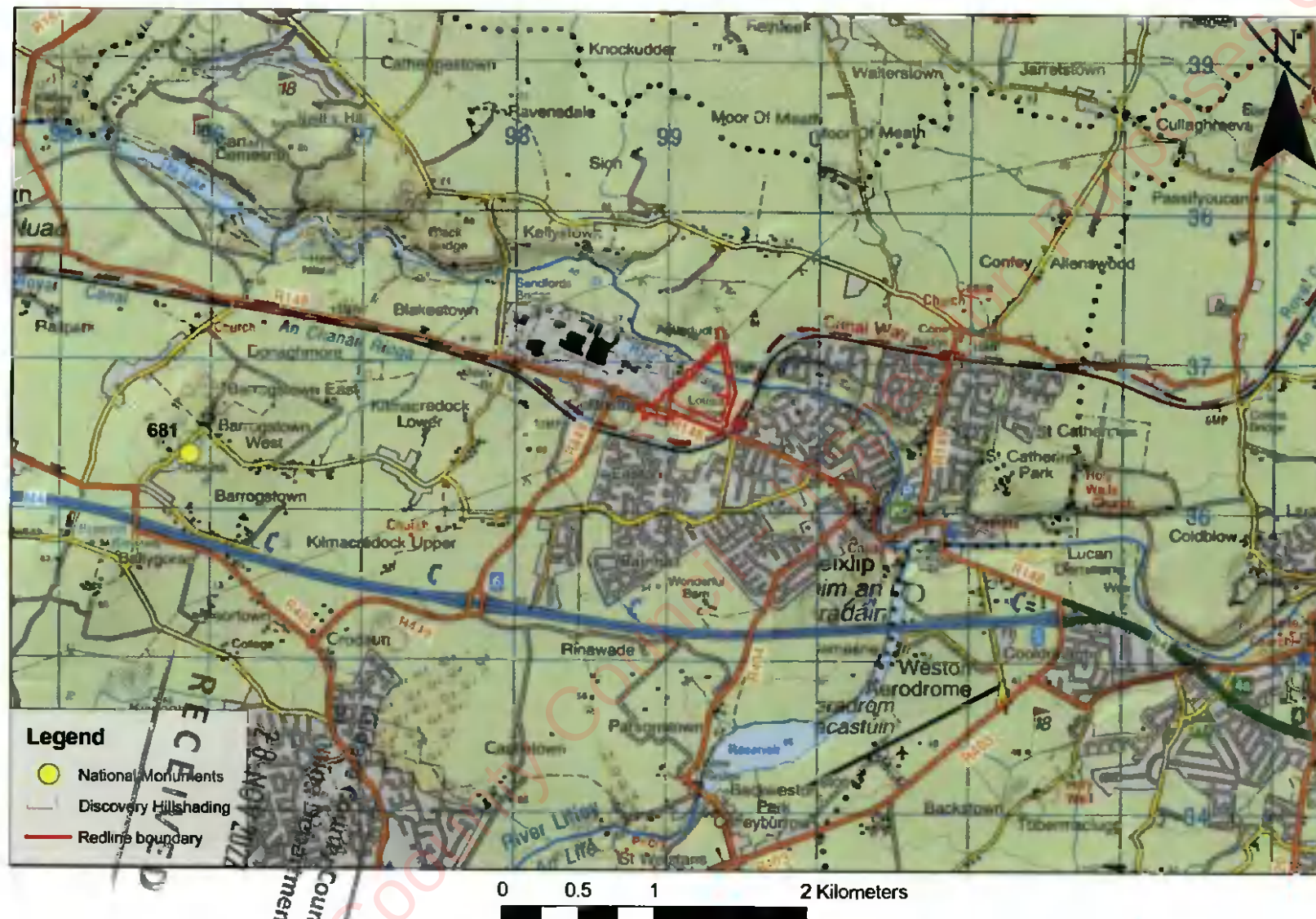


Figure 15.2 Proposed development boundary in relation to nearest National Monument (No. 681).

### 15.3.1.2 Recorded Monuments

No recorded monuments are located within the EIAR boundary.

Eight recorded monuments are located within 1 km of same and are listed in Table 15.1 and shown on Figure 15.3 below. The nearest recorded monument comprises a holy well KD011-007---- which is situated c. 56 m to the east of the eastern site boundary and c. 68 m east of the proposed OHL diversion. Further to the west two of these monuments KD011-054---- (habitation site) and KD011-055---- (Excavation miscellaneous) are located within 200 m of the proposed EIAR boundary (Figure 15.4). The latter consist of monuments that were detected during ground works associated with the northern link of the Celbridge Interchange Scheme. They were fully excavated and archaeologically resolved as part of that scheme. The remainder of the monuments are situated over 350 m from the EIAR boundary. Those nearest to the proposed development area are described below. All descriptions are taken from the Historic Environment Viewer (HEV) ([www.maps.archaeology.ie/historicenvironment](http://www.maps.archaeology.ie/historicenvironment)).

**Table 15.1 Recorded monuments within 1 km of the proposed development EIAR boundary.**

| SMR           | ITM E  | ITM N  | Description                | Townland                 |
|---------------|--------|--------|----------------------------|--------------------------|
| KD011-007---- | 699387 | 736650 | Ritual site - holy well    | LEIXLIP                  |
| KD006-001---- | 698880 | 738056 | Ritual site - holy well    | SION                     |
| KD006-002---- | 699130 | 737902 | Castle - unclassified      | CONFEEY                  |
| KD011-054---- | 698593 | 736810 | Habitation site            | COLLINSTOWN (Leixlip ED) |
| KD011-052---- | 698105 | 736142 | Habitation site            | COLLINSTOWN (Leixlip ED) |
| KD011-053---- | 698422 | 736550 | Fulacht fia                | EASTON                   |
| KD011-055---- | 698560 | 736765 | Excavation - miscellaneous | COLLINSTOWN (Leixlip ED) |
| KD011-056---- | 698344 | 736807 | Kiln                       | COLLINSTOWN (Leixlip ED) |

#### **KD011-007----**

Class: Ritual site - holy well

Townland: LEIXLIP

Scheduled for inclusion in the next revision of the RMP: Yes

Description: At the N foot of a short, moderately steep slope on the W bank of the Royal Canal. According to Jackson (1979-80, 160) the well is not associated with any specific saint but is believed locally to be near the site of a monastery. It is associated with a cure for sore eyes and is traditionally visited during August when rags are sometimes left on the bushes and briars beside it. A large, square, water-filled pool (L 9 m; Wth 9 m) is open towards the NW and NE but is enclosed by well-built, mortared stone walling on the SE and SW. No trace of an associated rag-tree/bush.

Compiled by: Gearóid Conroy

Date of upload: 10 June 2011

The well was visited as part of the recent site walk-over survey given its proximity to the proposed development area. It is located adjacent to the Royal Canal and is access via a number of stone steps which lead down to the well from a nearby walking path in frequent public use.



Plate 15.1 Holy well KD011-007- looking SE.

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**Plate 15.2 View towards proposed OHL diversion from area of holy well KD011-007- looking NW<sup>36</sup>.**

#### **KD011-054----**

Class: Habitation site

Townland: COLLINSTOWN (Leixlip ED)

Scheduled for inclusion in the next revision of the RMP: No

Description: Eighteen potential archaeological sites were found during monitoring of topsoil-stripping on the Celbridge Interchange, from April to December 2001 (Licence no. 01E0306). Most were resolved through subsequent excavation. The scheme was approximately 4 km in length and ran from Celbridge to Leixlip through gently undulating land with a mixture of arable, pasture and woodland. The southern part of the scheme runs through an area heavily influenced by 18th-century landscape design, with avenues, woodland and tree-lined field boundaries centred on the early 18th-century house at Castletown.

This site (Site 16) was divided into three phases: Phase 1, the earliest, consisted of all features which cut the natural subsoil. Phase 2 was the large northerly orientated ditch, and Phase 3 was the final phase of ploughing. Phases 1 and 2 may be contemporary but as explained below, have been dealt with separately.

Nine features were identified in Phase 1, mostly concentrated in the north-western area of the site. In the north-western sector there was a hearth feature, two shallow post-holes, two pits and a possible post-hole. In the south-eastern quadrant there was a linear cut and an oval pit. In the south-western corner was an oval cut. These features suggest a habitation site of some kind. There was, however, no obvious pattern to the post-holes nor enough of them to suggest a structure. The two post- or stake-holes close to the hearth may have been associated with it. Burnt and unburnt bone was found in the pit close to the hearth. It may have been a rubbish-pit. It was truncated on its southern side by a plough-furrow.

<sup>36</sup> Note existing screening.

Two pits, 0.35 m apart, were found in the southern area of the site. Burnt and unburnt bone was found in the fills of one of them. Burnt bone and a sherd of medieval pottery were found in pit C23. The sherd was the only artefact from this phase and therefore suggests a medieval terminus post quem for it.

Phase 2 is represented by a large northerly orientated ditch which cut through the entire site. It did not truncate any of the features described in Phase 1 so may be contemporary with them. It had a C-shaped profile in the south and a rounded V-shaped profile in the north. The fills varied from north to south. The fills of the ditch produced animal bone, cremated bone and two fragments of human skull. The skull fragments were found at the base of the ditch, along with 23 cattle-sized vertebrae fragments. Other cattle parts included a molar, a horn core, a humerus, a metacarpal and a metatarsal. These disarticulated bones were probably dumped into the ditch when it was open. The only artefact found in the ditch fills was an iron blade. Five fragments of cremated animal bone were found in the same fill as the blade.

This feature seems to have been a boundary ditch. It does not correspond to any ditches marked on the first edition OS 6-inch map so must pre-date the early 19th century.

Phase 3 is represented by nine plough-furrows. They ran across the site from east to west and truncated the large ditch and some other features. They varied in width from 0.8 m to 0.3 m. Several post-medieval artefacts were found in the furrow fills, including pottery sherds, glass, clay pipe fragments and a nail. A flint flake was found in fill C12. Other artefacts were found in the topsoil during cleaning. These included a silver button, nails and two flint flakes. ([www.excavations.ie](http://www.excavations.ie))

Compiled by: Gearóid Conroy  
Date of upload: 10 June 2011

#### **KD011-055----**

Class: Excavation - miscellaneous  
Townland: COLLINSTOWN (Leixlip ED)

Scheduled for inclusion in the next revision of the RMP: No

Description: Eighteen potential archaeological sites were found during monitoring of topsoil-stripping on the Celbridge Interchange, from April to December 2001 (Licence no. 01E0306). Most were resolved through subsequent excavation. The scheme was approximately 4 km in length and ran from Celbridge to Leixlip through gently undulating land with a mixture of arable, pasture and woodland. The southern part of the scheme runs through an area heavily influenced by 18th-century landscape design, with avenues, woodland and tree-lined field boundaries centred on the early 18th-century house at Castletown.

This site (Site 17) lay 15.4 m to the south-east of Site 16 (KD011-054----). The area measured 6m by 4m and was visible as two charcoal-rich deposits. The site can be divided into two phases. Phase 1 is represented by a northerly orientated bottle-shaped cut. It was 4m in total length and 1.08 m wide in the oval part. The 1.3 m southern projection was 0.25 m wide. It was dug into the natural subsoil. It had vertical sides in the flue and gradual concave sides in the main oval section. The base was flat. The main, widest, part of the cut had eight fills. Some of these fills partly filled the flue; two were confined to the flue only. The fills were rich in charcoal and ash, and some contained burnt clay and bone.

At first it was thought that this feature might have been a corn-drying kiln. A portion of one of the charcoal-rich fills was sieved in an attempt to identify some charred seed remains. None were found. All the identified fragments of bone found in the fills were of juvenile pig and had been burned at 300-600°C. Because of the ash deposits and cremated bone fragments it can be suggested that this feature was a pig-roasting pit. It is not possible to determine whether it is contemporary with the features on Site 16. Phase 2 is represented by an east-west-running furrow, probably contemporary with the furrows on Site 16 to the north. ([www.excavations.ie](http://www.excavations.ie))

Compiled by: Gearóid Conroy. Date of upload: 10 June 2011



**Figure 15.3 Recorded monuments within 1 km of the proposed EIAR boundary.**



**Figure 15.4 Nearest recorded monuments to the proposed EIAR boundary.**

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### 15.3.1.3 Excavations Database

The database of Irish Excavations was searched in order to ascertain if any archaeologically positive results were uncovered within close proximity to the proposed development site. The proposed development area is located within the townlands of Leixlip and Confey, with Collinstown and Blakestown located immediately to the west. A number of summaries relating to archaeological investigations or excavations carried out on the nearby Celbridge Interchange Scheme were returned in addition to other licensed archaeological work in the immediate environs of the proposed development site. The summaries of the sites identified as part of the Celbridge Interchange Scheme are not repeated here as those nearest to the proposed development site are described above under recorded monuments KD011-054---- and KD011-055---- (see Section 15.3.1.2 above).

An archaeological excavation of a previously unrecorded site within Intel lands at Blakestown townland was carried out by Tobar Archaeological Services in 2019 and is summarised below.

*The excavation of archaeological features exposed within a development site at Blakestown, Leixlip, County Kildare was undertaken by Tobar Archaeological Services over a number of weeks between the 28<sup>th</sup> March and 9<sup>th</sup> April 2019 under excavation licence 19E0007. The excavation revealed the presence of an isolated area containing a number of pits, postholes and stakeholes. The site consists of a series of postholes, stakeholes and pits. The postholes are tentatively arranged in a roughly rectangular shape and surround a large 1.8m long sub-oval pit. Burnt bone fragments and charcoal flecks were present throughout the fills although no artefactual evidence which could provide an indication of a date and function was recovered. The presence of structural posts and stakeholes suggests a habitation site, albeit potentially temporary in nature. No occupational debris, spreads or dumps were uncovered and no evidence for burning in the form of a hearth was noted. Some oxidised clay fragments were present in some fills suggesting that burning may have occurred elsewhere. Radiocarbon dating of one structural posthole provided a date of 1263-1056 BC placing it within the middle to late Bronze Age period. The site at Blakestown is somewhat enigmatic, being atypical of Bronze Age structures and settlement sites excavated to date in the archaeological record. Its rectangular form is interesting and its precise function is uncertain. A domestic function or an association with a nearby domestic/settlement site is indicated by the presence of burnt animal bone and charred cereal grains. This coupled with the recovery of some lithic debitage would suggest that the site represents the remains of a small perhaps temporary settlement site. The site is situated adjacent and on the south side of the River Rye thus providing an ideal location for settlement.*

### 15.3.1.4 Newly Recorded Monuments Noted During Field Inspection

No new potential above-ground archaeological monuments were noted in the area of the proposed OHL diversion route during the archaeological walk-over survey. A photographic record of the route is presented in Appendix 15.2.

### 15.3.1.5 Topographical Files of the National Museum of Ireland

The topographical files of the National Museum of Ireland as shown on [www.heritagemaps.ie](http://www.heritagemaps.ie) was consulted for any find spots on or near to the proposed development site. No finds spots are noted within or immediately adjacent to the proposed development area, with the nearest find spot comprising a Viking burial located c. 1.1 km to the south in Barnhall townland.

### 15.3.1.6 Review of Cartographic Sources

A review of available cartographic sources for the area of the proposed development site was carried out for any items of archaeological potential which may be indicated on such mapping. The 17<sup>th</sup> century Down Survey map of the Barony of Salt in which Leixlip is located was consulted but does not show any items of archaeological potential. Similarly, the 1<sup>st</sup> edition OS map (1837-1842) and later 2<sup>nd</sup> edition map (1888-1913) were consulted but do not depict any items of archaeological potential within the proposed development boundary. 'Spa Well' which is recorded monument KD011-007 Holy well is indicated and named on both editions (Figure 15.5 and Figure 15.6).



Figure 15.5 Proposed OHL diversion and existing line on 1<sup>st</sup> edition OS background<sup>37</sup>.

<sup>37</sup> Note 'Spa Well' to south-east.

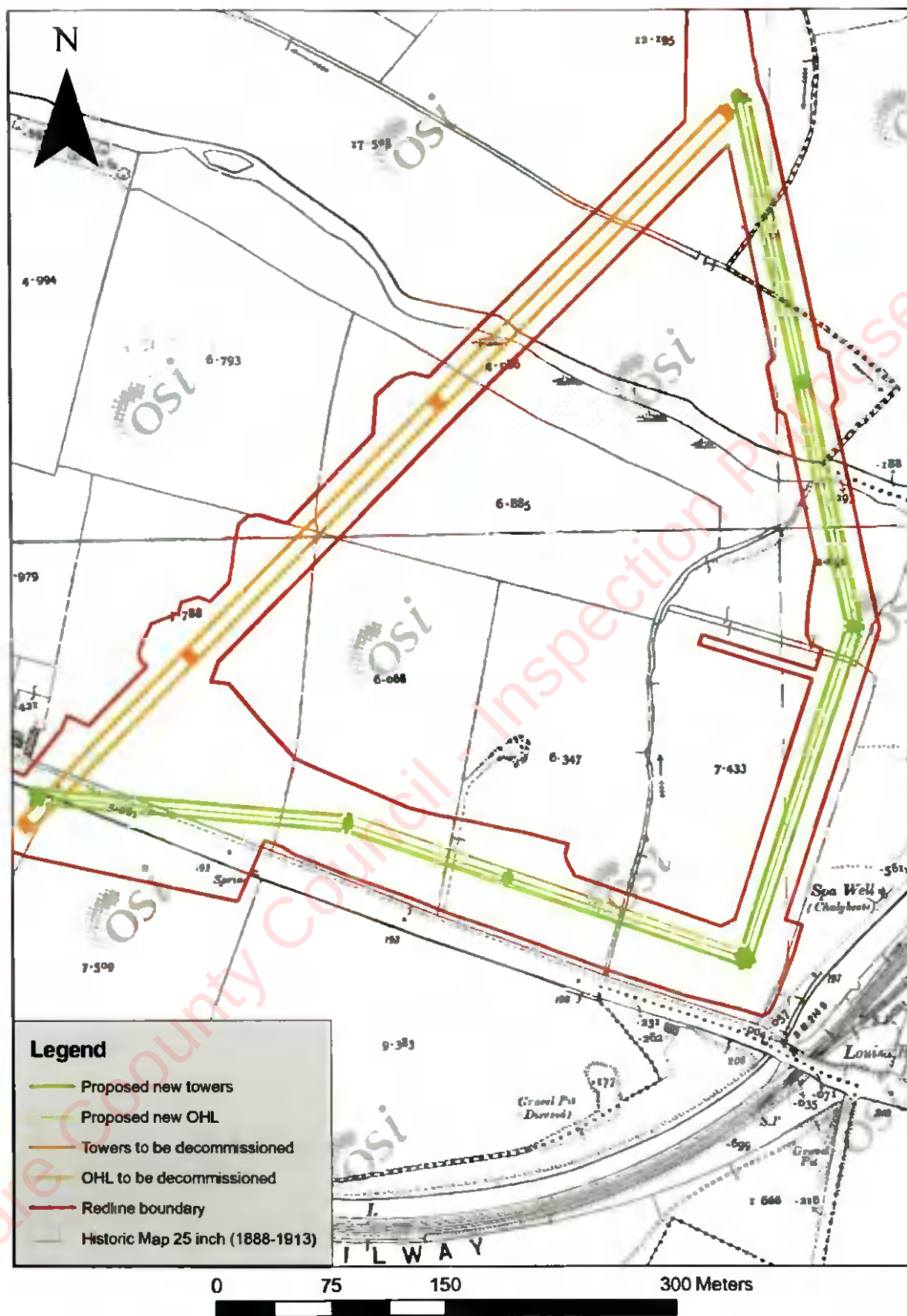


Figure 15.6 Proposed OHL diversion and existing line on 2<sup>nd</sup> edition OS background.<sup>38</sup>

<sup>38</sup> Note 'Spa Well' to south-east.

## 15.4 PREDICTED EFFECTS

Archaeological is a non-renewable resource. The overall objective of this assessment of impacts of the proposed development is to ensure that where a potential impact has been identified, that it can be mitigated against to ensure that the archaeological heritage will be available for future generations. This is in accordance with the policies as set out by the County Development Plan and the statutory legislation in relation to archaeology. The potential impacts on the archaeological heritage are assessed here.

### 15.4.1 POTENTIAL DIRECT EFFECTS

#### 15.4.1.1 Recorded Archaeological Resource

No National Monuments or recorded monuments are located within the proposed EIAR boundary therefore direct effects to this resource as a result of the proposed development are not identified.

#### 15.4.1.2 Newly Recorded Archaeological Sites

No new above-ground archaeological sites were noted on the route of the proposed OHL diversion during the site walk-over. No direct effects to such features are therefore identified.

#### 15.4.1.3 Sub-surface Archaeological Sites

A potential impact on the archaeological resource lies in the uncovering of previously unknown sub-surface archaeological sites or features within the footprint of the proposed new towers for the OHL diversion. The likelihood of uncovering such sites along the proposed OHL diversion is low to negligible in the areas of towers T3, T2 and T1 along the southern route of the diversion as these structures are located in lands which have already been developed. Towers 7, 6, 5 and 4 are located in greenfield areas which have a greater potential to contain as yet undiscovered sub-surface archaeology. Given the localised nature of the groundworks associated with the construction of the towers potential direct effects to sub-surface archaeology, should it exist, will be largely confined to the footprint of the tower foundations. Such effects would be permanent and negative. The mitigation measures to ameliorate the potential effects are outlined below.

### 15.4.2 POTENTIAL INDIRECT EFFECTS

Indirect effects are where a feature or site of archaeological merit or its setting is located in close proximity to a proposed development. Indirect effects here are mainly concerned with impacts on setting of archaeological sites. Effects on settings of sites may arise when a development is proposed immediately adjacent to a recorded monument or cluster of monuments. While the proposed development may not physically impact on a site, it may alter the setting of a monument or group of monuments. For purposes of assessing visual impact on setting, the uniqueness of the monuments, the potential interrelationships of monuments, the inter-visibility of monuments, visual dominance and whether a setting is altered or unaltered can be used to assess impact. The nature and dominance of the proposed development is also taken into consideration

#### 15.4.2.1 Recorded Archaeological Resource

No National Monuments are located on or in close proximity to the proposed OHL diversion with the nearest National Monument c. 3 km to the west-south-west. No indirect effects on the setting of such monuments as a result of the proposed development are identified.

No recorded monuments are located within the proposed development boundary. One recorded monument KD011-007 Holy well is situated c. 68m to the east of the proposed OHL diversion. The well is situated at the bottom of a short flight of steps immediately east of a publicly used walk-way adjacent to the Royal Canal. Tower 4 will be situated c. 102 m to the south-west of the recorded monument, while Tower 5 will be situated c. 166 m to the north-west. The immediate setting of the well will not be impacted by the proposed development, however, a change to the wider setting of the monument is acknowledged. The wider setting of the holy well has already been altered by the

introduction of modern residential, commercial and industrial developments to the surrounding area in recent decades. The introduction of the proposed OHL diversion to this already much-altered landscape will not result in a significant indirect effect on the setting of the holy well. The significance of effects on setting is regarded as Slight.

## 15.5 MITIGATION AND MONITORING MEASURES

The potential exists for the presence of previously unknown sub-surface archaeological features or sites to be located within the footprint of the proposed Towers within greenfield or undisturbed areas of the OHL diversion route. In order to ameliorate the potential direct effects of ground works on such features, should they exist, the following mitigation measures will be implemented.

- Archaeological monitoring under licence from the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage (DHLGH) of all ground works in greenfield areas. A report on the results of the monitoring will be compiled on completion of the work and submitted to the local authority and the National Monuments Service. Depending on the results of the monitoring, further mitigation may be required such as preservation in-situ (avoidance) or preservation by record (archaeological excavation).

## 15.6 RESIDUAL IMPACTS

The potential effects on sub-surface archaeological finds, features and deposits as a result of groundworks associated with the development within the green areas would be permanent, significant and irreversible without implementing mitigation measures. This potential effect is negated by undertaking licensed archaeological monitoring of ground works in greenfield areas. Should previously unrecorded archaeological features be uncovered during monitoring they can be dealt with in a controlled scientific manner either through preservation in situ (avoidance) or preservation by record (excavation). The remainder of the route (Towers 1, 2 and 3) do not have archaeological potential since topsoil removal and ground reduction has already taken place in these areas.

Once the mitigation measures are implemented in full, the residual impact will be imperceptible.

## 15.7 CUMULATIVE IMPACT

No direct effects to the recorded archaeological resource as a result of the proposed development have been identified. A slight indirect effect on the wider setting of the nearest recorded monument KD011-007---- Holy well has been identified. Given the largely altered landscape within which the well is located when considered cumulatively with other developments no increase to the indirect effects on the monument are identified.

This section should assess any indirect and cumulative impacts of the proposed development with relevant developments or projects in the vicinity of the site. A list of live applications and permissions granted over the last 10 years in the vicinity of the site will be provided to you for this purpose.

## 15.8 INTERACTIONS

Interactions between issues that arise in separate chapters are assessed as they occur in each chapter. Cumulative effects are similarly assessed as appropriate in the relevant chapters of the EIAR. The final chapter of the EIAR, Chapter 17 *Interactions & Cumulative Effects*, shows where interactions and cumulative effects have been identified and how they have been addressed.

Information on interactions can be provided under this heading and will be reviewed and consolidated in Chapter 17 by the EIAR coordination team.

# 16 ACCIDENT & DISASTER RISKS

## 16.1 INTRODUCTION

Under the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (the "COMAH Regulations") which implement the Seveso III Directive (2012/18/EU), the proposed development is not a COMAH site due to the nature of the proposed development.

In order to ensure a comprehensive assessment of potential environmental effects due to risks of major accidents and/or disasters as relevant to the development, this chapter presents an additional review of the characteristics of the proposed development and of the project location to consider potential for accident scenarios that are outside the scope of the COMAH Regulations.

In assessing likely potential and predicted impacts, account has been taken of both the importance of the attributes and the predicted scale and duration of the likely impacts

### 16.1.1 METHODOLOGY

The assessment has been carried out generally in accordance with the following guidelines:

- EPA 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2022);
- EPA 'Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (2015);
- National Roads Authority (NRA) 'Guidelines on Procedures for the Assessment and Treatment of Hydrology for National Road Schemes' (2009).

In the EIA assessment, consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that attribute.

The principal attributes (and impacts) to be assessed include the following:

- Potential hazard arising from risk of major accident.
- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any)

#### 16.1.1.1 Sources of Information

The collection of baseline regional data was undertaken by reviewing the following sources:

- Office of Public Works (OPW) flood mapping data ([www.floodmaps.ie](http://www.floodmaps.ie)).

Site specific data was derived from the following sources:

- Various site plans and drawings.
- Designers' hazard elimination and management record
- EirGrid/ESB safety statements

## 16.2 THE PROPOSED DEVELOPMENT

The proposed development is described in Chapter 4 *Project Description*. As mentioned above, it has been designed to adhere to strict safety standards covering all aspects of fit-out and operation. These standards ensure that potential for major accidents is comprehensively addressed in full compliance with legislation and best practice and that safeguards are put in place where appropriate. These standards cover all aspects of construction, industrial design, operation and fire safety.

Measures will ensure that accident risks arising from the operation of the proposed development are comprehensively addressed so that potential for major accidents is adequately controlled in full



compliance with all applicable standards and best practice including EU Best Available Technology (BAT) standards.

## 16.3 THE RECEIVING ENVIRONMENT

### 16.3.1 SITE DESCRIPTION

Intel Ireland's Leixlip campus is located off the R148 Maynooth-Leixlip Regional Road approximately 1.6 km north of the M4 motorway route (Junction 6) and 2 km northwest of Leixlip town centre. To the front (south) of the plant the campus grounds are mainly flat in topography consisting of employee multi-level car parks, tarmac-surfaced car parks and, in Eastlands, gravel-surfaced car parks. Peripheral landscaped areas bound the site. To the rear of the plant there is a gradual slope descending from south to north towards the Rye Water River valley. There is, however, a pronounced descent from the elevation of the newly built Process Water Tanks in Eastlands (c.59 m OD) through to the green belt referred to earlier (T4 & T5 / 55 – 47 m OD) and beyond to the Rye Water River (c.33 m OD).

The nearest residences are approximately 115 metres away from the development areas at the closest point (proposed tower T4).

The existing Intel Manufacturing facility is operated in accordance with an Industrial Emissions Licence issued by the EPA (licence ref P0207-05). Section 9.1 of the licence *Accident Prevention Measures*, includes details of measures to prevent accidental emissions. These cover: -

- spill or emergency containment measures in place across the facility
- raw materials storage to ensure adequate containment
- management of underground pipelines to prevent uncontrolled losses to ground
- waste segregation
- wastes storage to ensure adequate containment
- management of process wastewater containing biological/chemical substances
- storage and transfer of materials
- controlled delivery of fuel and raw materials to site
- fire prevention and detection
- firewater management
- safety and accident response training
- pollution prevention initiatives
- environmental policy and
- environmental management system

### 16.3.2 WATER BODIES AND FLOOD RISK

The nearest surface water receptor is the River Rye Water which is located c. 90 m and 70 m from the T5 and T6 towers. A Flood Risk Assessment for the site has been undertaken by AWN Consulting which is included in the current application. Tower 6 will be erected within the CFRAM Flood Zone A and B. It is concluded that there is no conflict between flood risk and the construction of the tower T6, as its structural design has taken into account the possible buoyancy effect of the expected flood level, which in a current scenario is expected to mean a water height of c. 0.80 m and 1.43 m above ground level, for a medium and low annual exceedance probability, respectively (1% and 0.1%). With regard to the other 6 no. towers, they are located within Flood Zone C

There are no potential residual risks as the projected tower will not affect any other existing infrastructure should an extreme event occur. This includes fluvial, coastal and groundwater future flood risks.

### 16.3.3 SEISMIC ACTIVITY

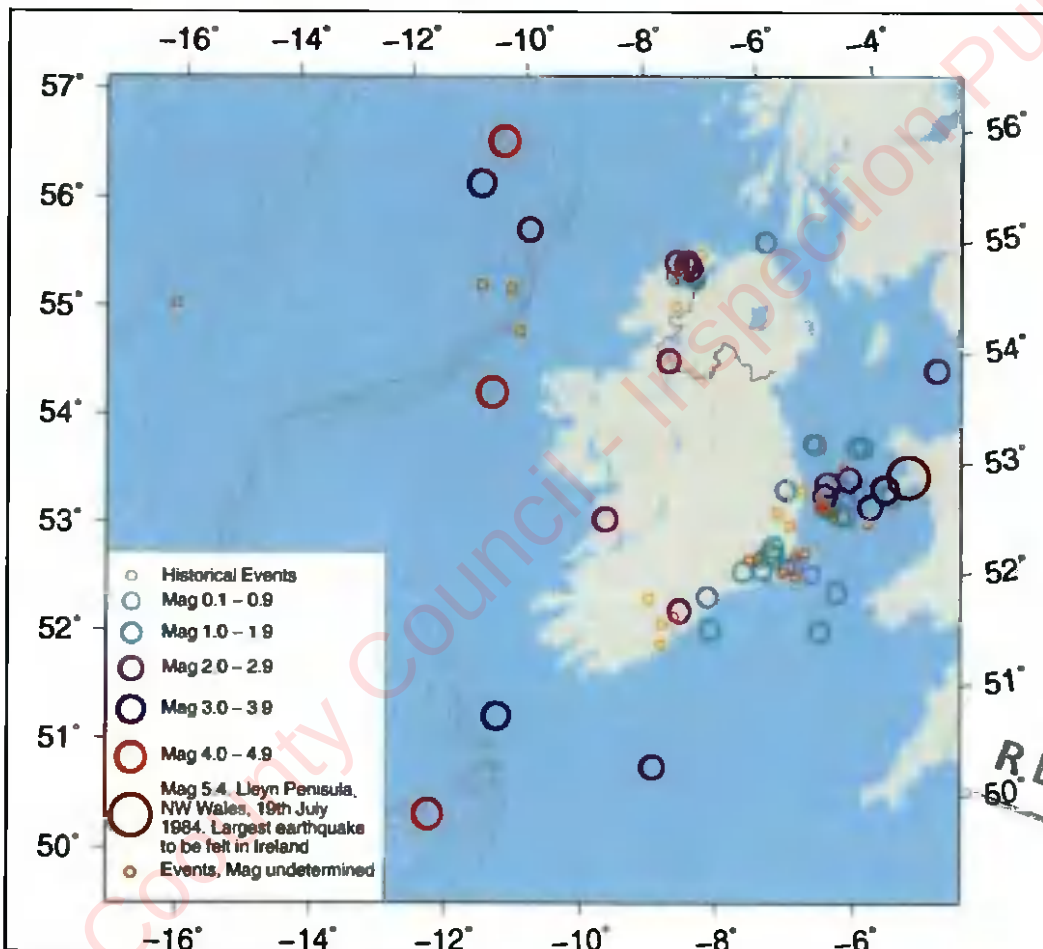
Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating the slope failure. Instability is often significantly

increased by man's activities in building houses, roads, drainage and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a result.

In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff landslides and falls lead to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities.

There are no active volcanoes in Ireland.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics, Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently there are five permanent broadband seismic recording stations in Ireland including IWEX on Carrickbyrne Hill, Co. Wexford, running from 01/01/2011 and operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events.



**Figure 16.1 Seismic movements**

Figure 16.1 above indicates the principal events have occurred along/ beyond the east, south-east and south of Ireland with seismic movements generally up to 1.9 magnitude recorded on land. The most significant events recorder in the vicinity of the proposed site were up to 1.9 magnitude. Earthquakes with magnitude of about 2.0 or less are usually called microearthquakes; they are not commonly felt by people and are generally recorded only on local seismographs<sup>46</sup>. This level of seismic activity is insignificant in terms of potential to cause accidents or disasters at the proposed development.

## 16.4 PREDICTED IMPACTS

Due to the comprehensive controls and design standards that have been followed during initial design and that will be followed during detailed design combined with the measures contained in the Outline CEMP there is no significant potential for the proposed development to give rise to significant adverse effects on the environment due to accidents or disasters. This applies to accidents/disasters arising from external factors as well as accidents arising from activities at the site. All risks can be considered to be negligible.

As such the impact is considered to be *long term, imperceptible* and *neutral*.

## 16.5 MITIGATION AND MONITORING MEASURES

No specific measures are required or proposed as part of the EIA process.

## 16.6 MONITORING

No specific monitoring is required or proposed as part of the EIA process.

## 16.7 RESIDUAL IMPACT

The residual impact is considered to be *imperceptible* and *neutral*.

# 17 INTERACTIONS & CUMULATIVE EFFECTS

## 17.1 INTRODUCTION

This chapter of the EIA identifies and outlines where and how interactions between the various impacts identified in the different chapters have been addressed in this EIA. This covers both the construction and operational phases of the proposed development.

The project team, in conjunction with the assistance of a variety of specialist environmental consultants, each one an expert in their chosen field, assessed the potential impact arising from the construction and operation of the proposed development. The interaction of environmental aspects was clearly identified at an early stage in the project to be an important factor to be considered in the full evaluation of the environmental impacts associated with the proposed development.

In the interests of clarity, significant interactions and inter-dependencies have been taken into consideration, and are addressed, under each specialist heading in the EIA. We refer the reader to the relevant chapters.

Section 17.2 below shows identifies where there is significant potential for interactions. Section 17.3 outlines the types of interactions considered under each topic.

## 17.2 MATRIX OF INTERACTIONS

This section of the EIA provides a simple matrix identifying environmental components and recording where interactions are identified. These are then expanded upon in the text that follows, with cross references made to the more detailed assessments outlined in the relevant chapters of the EIA.

Again, for detailed descriptions and accounts, we refer the reader to the relevant sections of the EIA.

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**Table 17.1 Matrix of Interactions**

| Interaction                         | Population & Human Health |     | Biodiversity |     | Land, Soils, Geology & Hydrogeology |     | Water & Hydrology |     | Air Quality & Climate |     | Noise & Vibration |     | Landscape & Visual |     | Material Assets |     | Waste Management |     | Archaeology & Built Heritage |     |
|-------------------------------------|---------------------------|-----|--------------|-----|-------------------------------------|-----|-------------------|-----|-----------------------|-----|-------------------|-----|--------------------|-----|-----------------|-----|------------------|-----|------------------------------|-----|
|                                     | Con.                      | Op. | Con.         | Op. | Con.                                | Op. | Con.              | Op. | Con.                  | Op. | Con.              | Op. | Con.               | Op. | Con.            | Op. | Con.             | Op. | Con.                         | Op. |
| Population & Human Health           |                           |     | x            | x   | x                                   | x   | x                 | x   | ✓                     | x   | ✓                 | x   | ✓                  | ✓   | ✓               | x   | x                | x   | x                            | x   |
| Biodiversity                        |                           |     |              |     | ✓                                   | x   | ✓                 | x   | ✓                     | x   | ✓                 | x   | x                  | x   | x               | x   | ✓                | x   | x                            | x   |
| Land, Soils, Geology & Hydrogeology |                           |     |              |     |                                     |     | ✓                 | x   | ✓                     | x   | x                 | x   | x                  | x   | x               | x   | ✓                | x   | ✓                            | x   |
| Water & Hydrology                   |                           |     |              |     |                                     |     |                   |     | x                     | x   | x                 | x   | x                  | x   | x               | x   | x                | x   | x                            | x   |
| Air Quality & Climate               |                           |     |              |     |                                     |     |                   |     |                       |     | ✓                 | x   | x                  | x   | x               | x   | x                | x   | x                            | x   |
| Noise & Vibration                   |                           |     |              |     |                                     |     |                   |     |                       |     |                   |     | x                  | x   | x               | x   | x                | x   | x                            | x   |
| Landscape & Visual                  |                           |     |              |     |                                     |     |                   |     |                       |     |                   |     |                    |     | x               | x   | x                | x   | ✓                            | ✓   |
| Material Assets                     |                           |     |              |     |                                     |     |                   |     |                       |     |                   |     |                    |     |                 |     | x                | x   | x                            | x   |
| Waste Management                    |                           |     |              |     |                                     |     |                   |     |                       |     |                   |     |                    |     |                 |     |                  |     | x                            | x   |
| Archaeology & Built Heritage        |                           |     |              |     |                                     |     |                   |     |                       |     |                   |     |                    |     |                 |     |                  |     |                              |     |

**Key**

|   |                    |
|---|--------------------|
| x | No Interaction     |
| ✓ | Weak Interaction   |
| ✓ | Some Interaction   |
| ✓ | Strong Interaction |

Con. ⇔ construction phase  
Op. ⇔ operational phase

See following pages for descriptions of interactions and cumulative that correspond to grid boxes marked with a 'tick'.  
Boxes with an 'x' indicate that no interactions or cumulative effects are likely to occur.

## 17.3 INTERACTIONS

### 17.3.1 POPULATION & HUMAN BEINGS

#### Noise & Vibration

The increasing industrial activity has the potential to increase ambient noise levels at nearby sensitive receptors for people – dwellings and amenities. The noise assessment of construction vehicle movements associated with the site has shown that the predicted effect will be a negative, imperceptible and short-term effect on off site noise sensitive locations considering existing traffic volumes on the local road network.

Due to the nature of the proposed construction works and the large distance between vibration-generating activity and residential sensitive locations, the effect at these locations is expected to be neutral, imperceptible and short-term.

#### Landscape & Visual Impacts

Increasing industrial development has the potential to reduce visual amenity for sensitive receptors. There will be a localised intensification of effects on nearby amenities around the Royal Canal. These will represent a localised intensification and spatial expansion of pre-existing effects that accord with the zoning and established use of these lands. The Landscape & Visual impacts of the proposed development are addressed in Chapter 11..

### 17.3.2 BIODIVERSITY

#### Land, Soils, Geology & Hydrogeology

Interactions between hydrogeology, soils & land and biodiversity can occur through an accidental pollution event during construction, which could result in habitat degradation of habitats within the proposed development site and adjacent/downstream designated sites and their associated qualifying interests. Following the mitigation measures outlined within Section 6.5.1.1 impacts to habitats, flora and fauna from lands, soil, geology and hydrogeology interactions are not predicted to be significant. The Land, Soils, Geology & Hydrogeology impacts of the proposed development are addressed in Chapter 7.

#### Water and Hydrology

Interactions between water & hydrology and biodiversity including habitats, flora and fauna can occur through impacts to water quality either arising from an accidental pollution event or increased sedimentation during the construction stage, the potential release of contaminated dewatered groundwater into the local surface water network during construction or an accidental pollution event during the operational stage. This interaction has the potential to result in significant impacts on hydrologically connected habitats and sensitive fauna that rely on these habitats. Following the implementation of mitigation measures outlined in Section 6.5.1.1, impacts to habitats, flora and fauna from water & hydrology interactions are not predicted to be significant.

#### Air Quality & Climate

Interactions between air quality and flora and fauna in adjacent habitats and designated sites can occur during the construction stage due to dust emissions arising from construction works. This interaction has the potential to result in significant impacts on biodiversity. However, given the location, scale and nature of the proposed development, impacts to flora and fauna are not predicted to be significant. The Air Quality & Climate impacts of the proposed development are addressed in Chapter 9.

### Noise & Vibration

Interactions between noise and sensitive fauna, namely birds and badgers can occur and arise from increased noise levels during the construction stage. This interaction has the potential to result in significant impacts and has been assessed when considering disturbance impacts during construction. Following the implementation of mitigation measures outlined in Sections 6.5.1.3 and 6.5.1.4, impacts to fauna from noise interactions are not predicted to be significant.

During construction the implementation of best practicable means and the measures included in the Outline CEMP will ensure no significant effects are caused by the proposed development. The predicted construction traffic noise impacts are anticipated to be negligible. The Noise & Vibration impacts of the proposed development are addressed in Chapter 10.

### Waste Management

Construction waste removal has potential to spread invasive species. No species listed in Schedule 3 of the *Birds and Natural Habitats Regulations* have been identified on sites. Therefore, it has been determined that there is no likelihood that invasive species will be spread as result of the proposed development. The Waste Management impacts of the proposed development are addressed in Chapter 13.

## **17.3.3 LAND, SOILS, GEOLOGY & HYDROGEOLOGY**

### Water and Hydrology

Land, soils, geology & hydrogeology affect surface water through a number of means which have potential to interact with surface water, particularly during construction activity – e.g., surface water management in excavations and construction dust. Measures included in Chapter 8 and the Outline CEMP will ensure there is no impact as a result of this. Water and Hydrology impacts of the proposed development are addressed in Chapter 8.

### Air Quality & Climate

Excavation and removal of soil and stone has the potential to impact on air quality through the generation of dust. Due to the small scale of these activities, it is considered that as a result of the good practice mitigation measures proposed, fugitive dust emissions will be negligible. The Air Quality & Climate impacts of the proposed development are addressed in Chapter 9.

### Waste Management

The proposed development has been designed to minimise the quantity of material to be excavated, maximise reuse onsite and subsequently minimise the quantity of material requiring removal off-site as a waste. Waste impacts of the proposed development are addressed in Chapter 13 Waste Management.

## **17.3.4 WATER & HYDROLOGY**

### Land, Soils, Geology & Hydrogeology

Land, soils, geology & hydrogeology affect surface water through a number of means. These effects have potential to interact with surface water particularly during construction – e.g., surface water management in excavations and construction dust. Measures included in Chapter 7 and in the Outline CEMP will ensure there is no impact as a result of this. Land, Soils, Geology & Hydrogeology impacts of the proposed development are addressed in Chapter 7.

### 17.3.5 WASTE MANAGEMENT

#### Population and Human Health

The potential impacts on human beings are in relation to incorrect management of waste during construction phase, which could result in littering and presence of vermin – with associated potential for negative impacts on human health and residential amenity. A carefully planned approach to waste management and adherence to the project specific RWMP (Appendices 13.1), and the mitigation measures in Chapter 13, will ensure appropriate management of waste and avoid any negative impacts

#### Land, Soils, Geology and Hydrogeology

During the construction phase, excavated soil, stone, gravel, clay and made ground (c.1,320 m<sup>3</sup>) will be generated from the excavations required to facilitate site levelling and construction of new foundations. It is estimated that 740m<sup>3</sup> excavated material will need to be removed off-site. Where material has deemed unsuitable or is unable to be reused onsite it will be taken off-site, it will be taken for reuse or recovery, where practical, with disposal as a last resort. Adherence to the mitigation measures in Chapter 13 and the requirements of the RWMP (Appendix 13.1), will ensure the effect is long-term, imperceptible and neutral.

### 17.3.6 ARCHAEOLOGY & CULTURAL HERITAGE

#### Land, Soils, Geology and Hydrogeology

A potential effect on the land, soils, geological and hydrogeological environment includes the excavation and removal of soil and stone and the reuse of this material on site or reuse/recovery/disposal of this material off-site. Archaeological monitoring of all topsoil removal associated with site preparation will ensure the full recognition and recording of any potential subsurface finds or features. It is not anticipated therefore that there will be any residual impact on the archaeological heritage of the area. The Land, Soils, Geology and Hydrogeology impacts of the proposed development are addressed in Chapter 7.

### 17.3.7 BROADER INTERACTIONS

Each chapter of the EIAR considers the extent, if any, to which this proposed project will incrementally contribute to the establishment of the overall envelope of effects caused by the development of the proposed facility.

### 17.3.8 BROADER INTERACTIONS

Each chapter of the EIAR considers the extent, if any, to which this proposed project will incrementally contribute to the establishment of the overall envelope of effects caused by the development of the proposed facility.

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## 17.4 CUMULATIVE EFFECTS

Cumulative effects are addressed within Chapters 5 to 16 of this EIAR. A number of chapters present this under a distinct heading. In others it is addressed within the baseline and impacts sections where planned or permitted development is taken account of where relevant and significant.

The below Table 17.2 lists the relevant projects reviewed in undertaking this assessment.

**Table 17.2 Relevant other planned or permitted developments<sup>39</sup>**

| BRIEF DESCRIPTION OF APPLICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | REG. NO.                            | GRANT DATE |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|------------|
| For a new chemical tanker storage compound located north of FAB 10. The proposed development consists of a modification and alterations to previously permitted and partly built development under planning application Reg. Ref. 19/1054.                                                                                                                                                                                                                                                                                     | KCC: 22/491                         | Pending    |
| Extensions to the existing IR2 cafeteria building and corridors towards the front of the campus, comprising a single storey extension to the west and to the south of the existing IR2 cafeteria and administrative building.                                                                                                                                                                                                                                                                                                  | KCC: 21/1398                        | 10/01/2022 |
| Minor modifications and reconfigurations of the utilities yard, and the installation of waste storage tanks. The construction of a two storey extension to the Process Support building. The installation of 3no. additional waste tanks and associated access platforms and stairways. The proposed development includes linking pipe-bridges to the Fab10 and Fab14 support buildings, site development works, site utilities, site lighting, separation walls, road alterations, landscaping and all associated site works. | KCC: 21/229                         | 15/06/2021 |
| Minor modifications and reconfigurations of roof mounted ducting, and the addition of a steel framed service platform also to the roof of the previously permitted Fab building. An alteration to the existing Silane Pad is also proposed which entails the replacement of 2 No existing pad-mounted gas cylinders with a removable gas trailer.                                                                                                                                                                              | KCC: 20/333<br>ABP: PL09<br>.307806 | 30/11/2020 |
| Removal of the existing earthen mound towards the north (rear) of the Intel Campus, and proposed development comprising support buildings/ structures, and plant infrastructure, to be located in the area created by the mound removal.                                                                                                                                                                                                                                                                                       | KCC: 19/1054                        | 11/06/2020 |
| Modifications to the permitted ASU's (Air Separation Units, tank and equipment installations granted as part of the development permitted under An Bord Pleanála Ref. PL09.304672 (Kildare County Council Ref. 19/91), including reconfigured site layout of the proposed structures and support plant.                                                                                                                                                                                                                        | KCC: 19/1339                        | 06/03/2020 |
| Extended and revised manufacturing facility (granted under An Bord Pleanála Ref. PL09.248582; Kildare County Council Ref. 16/1229) including reconfigured and extended support buildings, water tanks and yards to provide for additional manufacturing capacity.                                                                                                                                                                                                                                                              | KCC:19/91<br>ABP:<br>PL09.304672    | 21/11/2019 |
| Modifications to existing Fab 10, 14 and 24 facilities and yards                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 17521                               | 10/08/2017 |
| 10 year permission for development comprising: Revised design and configuration of previously permitted manufacturing building Planning Reg Ref 12/435 – PL09.241071                                                                                                                                                                                                                                                                                                                                                           | KCC:16/1229<br>ABP:<br>PL09.248582  | 05/10/2017 |
| Modification and relocation of a previously permitted (Planning Ref. 11/1208) bulk hydrogen tank and associated equipment,                                                                                                                                                                                                                                                                                                                                                                                                     | 16/1063                             | 13/01/2017 |

<sup>39</sup> Register Reference numbers as per Kildare County Council

| BRIEF DESCRIPTION OF APPLICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | REG. NO.              | GRANT DATE |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|------------|
| separation wall and fencing adjacent to the existing hydrogen tank located to the rear of the Fab 10 facility. The hydrogen tank is 22.1 metres high and 3 metres in diameter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                       |            |
| Development to replace and relocate the electrical switchroom to the rear of Fab 10 and to decommission the existing switchroom – currently on Appeal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 16/406<br>PL09.246905 |            |
| The installation of chemical tanks and additional exhaust stacks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 15/565                | 25/08/2015 |
| The change of use of a temporary disassembly building to a permanent building for the storage of chemically soiled hazardous solid waste. Granted by the PA, and subsequently by ABP as the appeal was deemed not to constitute a valid appeal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 14/750<br>PL09.244142 | 30/01/2015 |
| A single storey addition to the rear of Fab 24 PSB and a mezzanine, tanks and tanker loading area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 14/100                | 12/05/2014 |
| The construction of a weather enclosure within the Ryebrook Substation compound                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 14/75                 | 05/05/2014 |
| The construction of an Air Separation Unit to support the manufacturing process                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 13/837                | 27/01/2014 |
| Temporary car parking to the west of the Intel campus – Granted by PA, and also subsequently on appeal by ABP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 13/786<br>PL09.242826 | 21/05/2014 |
| The raising of the parapet on the F24 Air Treatment building                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 13/549                | 07/10/2013 |
| Modifications and alterations to the previously permitted Ryebrook Extension (Intel dedicated) high tension Substation Compound (Kildare County Council Planning Reg. Ref: 11/207), including:- 1) The relocation and redesign of the permitted Electrical Building. The Building will now be 275 square metres and 6 metres high; 2)The relocation and vertical extension of both existing low level end mast pylons by 4.5 metres giving a total height of 20.75 metres from their current location south-west of the permitted compound to directly adjacent and north-east of the permitted compound area; 3) Modifications to the fencing and underground services; and, 4) Associated Site Development Works | 12/993                | 22/03/2013 |
| The modification of stacks on the site and works including the addition of various roof mounted equipment, alterations to and the addition of permitted stacks and structures in the yard between Fab's 14 and 24 (KCC Planning Reg. Ref. No. 11/1208). The proposed works also include a three storey extension to the rear of Fab24, sized 700 square metres and 17 metres high to house electrical equipment; Modifications to the single storey Electrical Switchroom (100sq.m) to the rear of Fab24 previously approved (KCC Planning Reg. Ref No. 11/1208)                                                                                                                                                   | 12/669                | 09/11/2012 |
| Proposal for the development of a new Fab – Granted following an Appeal to An Bord Pleanála                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 12/435<br>PL09.241071 | 17/01/2013 |
| The proposed development consists of the reconstruction, repair and structural strengthening (including increasing the height of the walls by 1.5metres) of an existing stone bridge ("Cullen's Bridge" over the Rye River) and associated laydown area, located at Intel Ireland, Leixlip, within the Rye Water Valley / Carton S.A.C.                                                                                                                                                                                                                                                                                                                                                                            | 12/398                | 10/09/2012 |
| A single storey extension with mezzanines to the FAB 10 Water Treatment Building and the associated demolition of an existing temporary construction assembly structure, the construction of a utility pipe bridge between the FAB 10 Utility Building and the IR1 Building; the partial demolition of the west side of the existing IR1 Building; the demolition and relocation of a single storey sprinkler pumphouse and tank and its relocation to the rear of FAB 10; the                                                                                                                                                                                                                                     | 12/135                | 11/05/12   |

| BRIEF DESCRIPTION OF APPLICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | REG. NO. | GRANT DATE |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|
| demolition of an existing waste drum store and the addition of miscellaneous items of plant and equipment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |          |            |
| Works to FABs 10 and 24 and IR6 including 29 no. roof mounted stacks over the FAB 24 parapet, a 3 storey air treatment building extension to the rear of FAB 24, a new steel structure supporting stacks and related equipment, 9 no. roof mounted air handling units and exhaust fans, a new external free standing structure with dedicated exhaust systems in the FAB 14/24 yard area; a clad roof mounted acoustic screen to the north west of FAB 24; a minor extension to and conversion of the existing single storey silane store to gas and chemical storage, a new horizontal hydrogen tank and road access to the rear of FAB 10; a single storey extension to the existing FAB 24 electrical switchroom; a new air handling unit located on the roof of the IR6 office building; additional external items of plant and minor modifications to existing elevations, utilities and yard areas; a previously permitted single storey aqueous building expansion to the rear of FAB 14 and the solvent bay expansion; 3 no water storage tanks and single storey pumphouse to the east of FAB 24, previously and associated security fencing. | 11/1208  | 30/04/12   |
| An extension to the existing Ryebrook (Intel dedicated) high tension Substation including landscaping and site works, the modification of an existing access road, upgrades to the existing effluent holding system, and the construction of a new pumping station                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 11/1207  | 09/05/12   |
| Reconfiguration of part of Intel lands including the demolition of buildings to the west of Fab10 and to the north of IR1, and the relocation of existing temporary contractor parking to the adjacent lands south of Intel at Collinstown Business Park using their existing site entrance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 11/846   | 13/10/11   |
| A single storey extension to the rear of the existing FAB24 Process Support Building                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 11/805   | 28/09/11   |
| A new two storey elevator extension sized circa 150m <sup>2</sup> to the west of FAB 10, a new bulk gas yard and canopy to the west of FAB 10, minor modifications and alterations to the previously permitted FAB 14 Bulk Gas Yard                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 11/591   | 02/08/11   |
| Extensions and Alterations to the FAB 14 Process Support Building and its previously permitted Extension                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 11/52    | 19/04/11   |
| Revisions and Extensions to previously permitted (FAB 14) Waste Collection Tanks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 10/1227  | 08/03/10   |
| Minor modifications and alterations to the existing FAB 14 permitted extensions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 09/1364  | 24/05/10   |
| Minor Modifications and Alteration to the Existing FAB 14 Permitted Extensions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 09/496   | 18/08/09   |
| Single storey extension to the west side of the FAB dock 14 and the replacement of cooling tower assembly with new equipment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 08/2143  | 01/04/09   |
| Single Storey Extension to the Bulk Chemical Distribution Area                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 08/1656  | 13/11/08   |
| A new nitrogen compound and extensions and alterations to FABs 10, 14 and 24                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 08/451   | 29/09/08   |
| 2 No. Extensions to the Bulk Chemical Distribution Sulte                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 07/482   | 13/07/07   |
| FAB 24.3 Extension                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 05/296   | 14/11/05   |
| Revised Site Car Parking, Fencing and Site Layout Changes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 04/2854  | 11/05/05   |
| Plan and Elevational Changes to existing permitted structure FAB 24(e)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 04/1134  | 19/08/04   |

| BRIEF DESCRIPTION OF APPLICATION                                                                                                       | REG. NO. | GRANT DATE |
|----------------------------------------------------------------------------------------------------------------------------------------|----------|------------|
| Additional Stack                                                                                                                       | 04/717   | 01/07/04   |
| New AHU for IR6                                                                                                                        | 04/439   | 26/04/04   |
| New stacks for IR1                                                                                                                     | 04/78    | 11/03/04   |
| New security fence and hut, relocation of existing hut, new cooling tower screen wall, signage, external shelters                      | 03/1327  | 03/10/03   |
| New stacks for FAB 24                                                                                                                  | 03/1326  | 15/10/03   |
| Extension to Building IR1                                                                                                              | 02/1899  | 18/09/03   |
| Pressure Reduction Building (AGI) – BGE                                                                                                | 02/191   | 22/05/02   |
| Retention / Completion FAB 24                                                                                                          | 01/979   | 03/09/01   |
| Multi-storey Car park                                                                                                                  | 01/662   | 06/09/01   |
| Forestry                                                                                                                               | 01/378   | 20/06/01   |
| FAB 24 Extension - Granted by ABP                                                                                                      | 01/38    | 28/02/02   |
| IR6 - Completion incl. 4th floor                                                                                                       | 00/2192  | 04/03/01   |
| IFO Extension (FAB 24) - Granted by ABP                                                                                                | 00/392   | 06/10/00   |
| Demolition of Wooden House                                                                                                             | 99/735   | 01/07/99   |
| Noise Abatement Structures, FAB 14 IPCL Compliance Requirement (Retention)                                                             | 98/1529  | 06/01/99   |
| Berm at Neighbouring Property                                                                                                          | 98/1494  | 22/12/98   |
| Application for Change of Use of Existing Listed Cottage                                                                               | 98/471   | 18/11/98   |
| Football Pitch Development                                                                                                             | 98/1166  | 11/02/99   |
| IR1 SECC Utility Building Exp. Retention                                                                                               | 98/481   | 12/08/98   |
| FAB 14 Extension                                                                                                                       | 97/1474  | 28/01/98   |
| FAB 14 Retention Package                                                                                                               | 97/1405  | 31/12/97   |
| Louisa Bridge – C4 Bldg. valid for 10 years                                                                                            | 97/1004  | 17/09/97   |
| IR1 ESSM Extension - C4 (valid for 10 yrs)                                                                                             | 97/1005  | 17/09/97   |
| IR3 Extension SECC/C4 (valid for 10 years)                                                                                             | 97/1006  | 16/09/97   |
| IR5 Retention                                                                                                                          | 97/762   | 01/09/97   |
| FAB 14 Extension                                                                                                                       | 97/738   | 03/09/97   |
| Site Development Package                                                                                                               | 97/669   | 27/08/97   |
| IR4 Smoking Room/Rest Room Extension                                                                                                   | 97/591   | 06/08/97   |
| Office and Sort/Test Building (IR5 - Granted by An Bord Pleanála)                                                                      | 95/1104  | 6/3/96     |
| Change of use; part of former Warehouse & office/canteen extension (IR3 - Granted by An Bord Pleanála)                                 | 95/865   | 18/1/96    |
| Canteen extension to ESSM building (IR1)                                                                                               | 95/549   | 2/8/95     |
| Retention and completion of Temporary Offices (IR99)                                                                                   | 94/1345  | 7/2/95     |
| Change of use of 3,450m <sup>2</sup> of Warehouse (IR3)                                                                                | 94/1410  | 1/2/95     |
| Extend warehouse building and site works.                                                                                              | 94/1331  | 22/12/94   |
| Wafer Fabrication Production Building (FAB 10E now FAB 14; Granted by An Bord Pleanála)                                                | 94/1218  | 9/5/95     |
| Extension to Nitrogen Compound                                                                                                         | 94/1182  | 4/1/95     |
| Demolition of dwelling house                                                                                                           | 94/1005  | 26/10/94   |
| Conversion of farm hse (Blakestown House) to Conference Centre                                                                         | 94/1004  | 16/11/94   |
| Recreation Centre                                                                                                                      | 94/773   | 5/10/94    |
| New car park and new Site entrance, c/w house demolition, internal road, covered walkway & new entrance to ESSM (West entrance to IR1) | 94/709   | 15/10/94   |
| New car park and internal road off existing site entrance (East of FAB 10)                                                             | 94/707   | 7/9/94     |
| Warehouse (ESSM - IR3)                                                                                                                 | 94/567   | 5/11/94    |
| Contractors Compound                                                                                                                   | 94/566   | Withdrawn  |
| Drum Store                                                                                                                             | 93/1381  | 23/3/94    |
| Electrical switch room extension (FAB 10)                                                                                              | 93/720   | 26/8/93    |

| BRIEF DESCRIPTION OF APPLICATION                                                                                                                                | REG. NO. | GRANT DATE |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------|
| Demolition of 2 No. dwelling houses (Granted by An Bord Pleanála - one house subsequently converted to Conference Centre)                                       | 92/1419  | -          |
| Enclosed link (from FAB 10/IR2 to ESSM)                                                                                                                         | 92/1418  | 14/6/93    |
| Site Entrance & road widening                                                                                                                                   | 91/1546  | 14/4/92    |
| Revised fenestration to office block of FAB 10 building (IR2)                                                                                                   | 91/1403  | 7/1/92     |
| Demolish two (2) houses (Lambert)                                                                                                                               | 91/1402  | 5/2/92     |
| New Road Sign ESSM                                                                                                                                              | 91/332   | 26/6/92    |
| Warehouse, ESB Sub Station, control building and surface water retention pond                                                                                   | 90/1320  | 21/2/91    |
| Integrated Circuit Manufacturing Industry (FAB10, includes office building (IR2), waste treatment, deionized water facility, nitrogen plant and chemical store) | 90/1230  | 19/12/90   |
| Systems Manufacturing and Assembly (ESSM - IR1)                                                                                                                 | 89/1200  | 7/12/89    |
| Site Development Works - Pre Intel (outline)                                                                                                                    | 85/665   | 5/12/85    |
| IDA & LANDS (55 acres) - Pre Intel                                                                                                                              | 84/1131  | 2/3/85     |

# LIST OF SOURCES

This list contains most of the sources used for the descriptions and assessments included in this EIAR. Other sources are given in the body of the report.

<sup>1</sup> Source: *Google Maps*

<sup>2</sup> Adapted from *Glossary of Impacts* contained in, draft revised *Guidelines on the information to be contained in Environmental Impact Assessment Reports*, EPA, 2017.

<sup>3</sup> Including *EIA Guidance - Screening*, *EIA Guidance - Scoping* and *EIA Guidance - EIA Report*, all EC, 2017.

<sup>4</sup> Schedule 6, 1 (d) of S.I. No. 296/2018, as transposed from Article 5, 1 (d) of Council Directive 2011/92/EC (as amended by Directive 2014/52/EU)

<sup>5</sup> *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*, EPA, 2022.

<sup>6</sup> *Census of Population 2011 and 2016*

<sup>7</sup> Smith, G.F., O'Donoghue, P., O'Hara, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.

<sup>8</sup> Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

<sup>9</sup> Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland*. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

<sup>10</sup> Stace, C. (2019) *New Flora of the British Isles*. 4<sup>th</sup> Edition. C&M Floristics.

<sup>11</sup> Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. Latimer Trend & Co., Plymouth.

<sup>12</sup> CEC. (Commission of the European Communities) (2013) *Interpretation manual of European Union Habitats EUR28*. European Commission, DG Environment.

<sup>13</sup> NPWS (2019). *The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview*. Unpublished NPWS report.

<sup>14</sup> Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. RSPB: Sandy

<sup>15</sup> Byrne, A., Moorkens, E.A., Anderson, R., Killeen, I.J. & Regan, E.C. (2009) *Ireland Red List No. 2 - NonMarine Molluscs*. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

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<sup>17</sup> Evelyn Moorkens and Associates (2018). *A molluscan survey of Shaughlin's Glen, Kellystown, County Kildare and a site at Intel, Leixlip*. Dated September 2018.

<sup>18</sup> Rowson, B. et al. (2021). *Freshwater Snails of Britain and Ireland*. FSC publications. ISBN 978-1-908819-58-1.

<sup>19</sup> Based on information on the Mollusc Ireland webpage on *Myxas glutinosa*: [Myxas glutinosa Glutinosa Snail \(habitas.org.uk\)](https://www.habitas.org.uk/) [Accessed 24/09/2021].

<sup>20</sup> Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London.

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<sup>21</sup> Environmental Protection Agency. (2022) *Guidelines on the information to be contained in Environmental Impact Assessment Reports*. May 2022. (refer to Table 3.3)

<sup>22</sup> Lockhart, N., Hodgetts, N. & Holyoak, D. (2012) *Ireland Red List No. 8: Bryophytes*. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

<sup>23</sup> Blockeel, T.L., Bosanquet, S.D.S, Hill, M.O. & Preston, C.D. (2014) *Atlas of British and Irish Bryophytes*. Pisces Publications, Berkshire.

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- <sup>27</sup> Fossitt (2000). *A guide to habitats in Ireland*. The Heritage Council, Kilkenny.
- <sup>28</sup> European Commission (2013) *Interpretation Manual of European Union Habitats*
- <sup>29</sup> Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523–544
- <sup>30</sup> NPWS (2011) Conservation Objectives Supporting Document for Wexford Harbour and Sloba Special Protection Area (Site Code 4076) & The Raven Special Protection Area (Site Code 4019). Version 1.
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- <sup>33</sup> Available from Birdwatch Ireland's website: <https://birdwatchireland.ie/birds/lesser-black-backed-gull/> [Accessed July 2022]
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- <sup>39</sup> Ecology Guidelines for Electricity Transmission Projects A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects
- <sup>40</sup> Hydrological report for Leixlip Spa, Co. Kildare, by Hydro-G (July 2008)
- <sup>41</sup> From EPA: *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (NG4 – 2016)
- <sup>42</sup> *Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports* EPA 2017
- <sup>43</sup> Landscape Character Areas, County Development Plan 2017 - 2023
- <sup>44</sup> Landscape and Landscape Assessment Consultation Draft of Guidelines for Planning Authorities June, 2000, Department of Environment, Community and Local Government.
- <sup>45</sup> National Inventory of Architectural Heritage NIAH Handbook edition June 2006 pp. 22-23
- <sup>46</sup> <https://pubs.usgs.gov/gip/earthq4/severitygip.html>